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1 October 2007

Mr. John Wrobel
Environmental Conservation and Restoration Division
Directorate of Safety, Health and Environment
ATTN: IMNE-APG-SHE-R
Building E5771
Aberdeen Proving Ground, MD 21010

Subject: Final Record of Decision, Remedial Action – G-Street Salvage Yard
Aberdeen Proving Ground, Maryland

Reference: Contract: W91ZLK-04-D-0014, Delivery Order 0015
DCN No.: 11785.004.017.AAAY

Dear Mr. Wrobel,

Enclosed are five (5) copies of the *Final Record of Decision, Remedial Action – G-Street Salvage Yard*, dated September 2007 for your use. This Record of Decision documents the selection of the Preferred Plan Alternative for the G-Street Salvage Yard as well as addresses comments raised during the Proposed Plan 45-day public comment period.

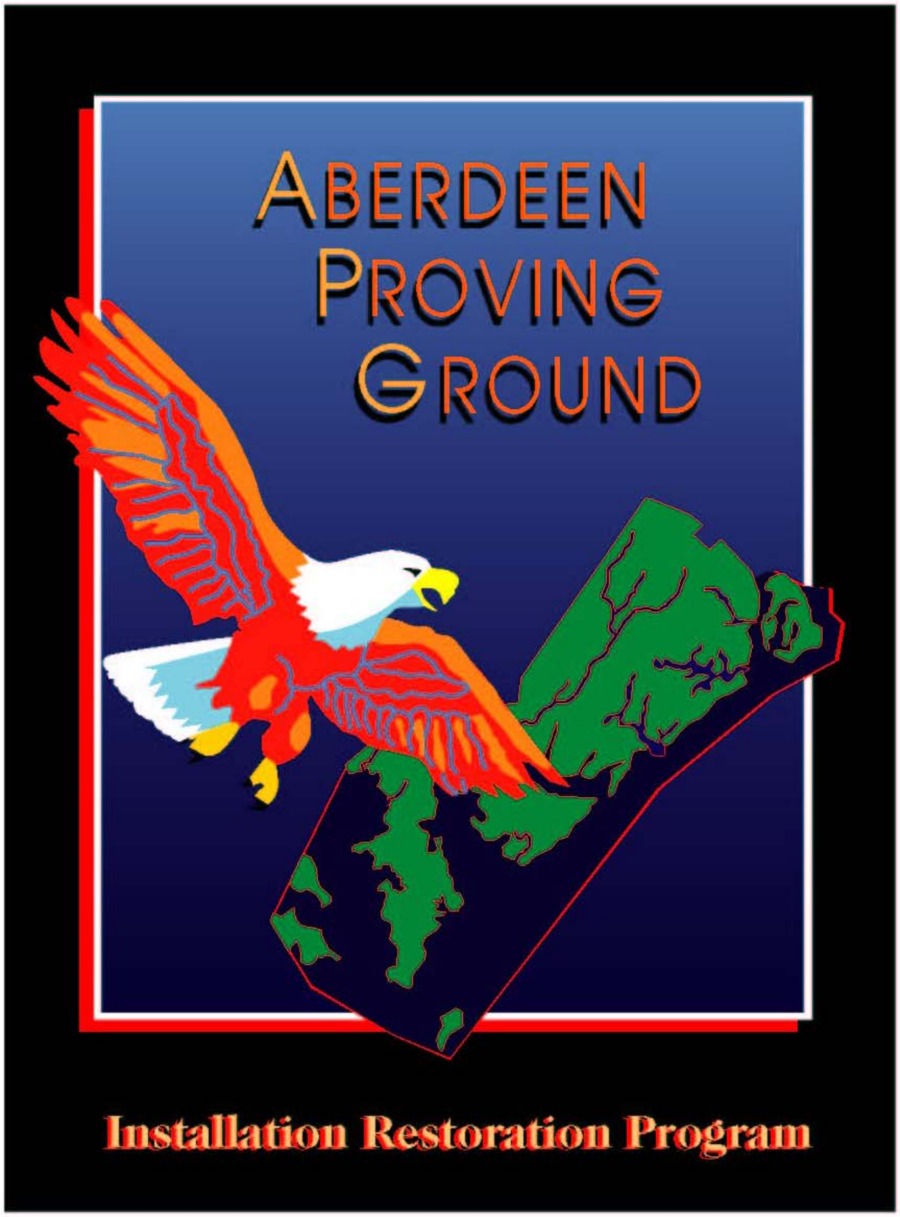
Please do not hesitate to contact me with any questions or comments at (410) 612-5910.

Very truly yours,
WESTON SOLUTIONS, INC.

Joseph P. Gross, P.E.
Project Manager

cc: Frank Vavra (EPA)
Heather Njo (MDE)
Rich Issac (AEC)
Dennis Druck (CHPPM)
Dick Wakeling (APG JAG)
George Mercer (APG PAO)
Bob McGlade (WESTON)
WESTON Project File (3.0, 5.2)

Enclosure



CANAL CREEK STUDY AREA

Record of Decision for
Remedial Action – G-Street Salvage Yard
Final
September 2007

U.S. Army Garrison
Aberdeen Proving Ground, Maryland

RECORD OF DECISION

REMEDIAL ACTION
G-STREET SALVAGE YARD
CANAL CREEK STUDY AREA

ABERDEEN PROVING GROUND, MARYLAND

SUBMITTED BY:

ENVIRONMENTAL CONSERVATION AND RESTORATION DIVISION
U.S. ARMY GARRISON ABERDEEN PROVING GROUND
EDGEWOOD, MARYLAND 21010

FINAL, SEPTEMBER 2007

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ACRONYMS AND ABBREVIATIONS

AEDB-R	Army Environmental Database – Restoration
APG	Aberdeen Proving Ground
APG-EA	Aberdeen Proving Ground-Edgewood Area
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
BRAC	Base Realignment and Closure
BRDA	Burn Residue Disposal Area
BTAG	Biological Technical Assistance Group
CCA	Canal Creek Aquifer
CCSA	Canal Creek Study Area
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	CERCLA Information System
CFR	Code of Federal Regulations
COC	Chemical of Concern
COMAR	Code of Maryland Regulations
COPC	Chemical of Potential Concern
CSM	Conceptual Site Model
CWM	Chemical Warfare Material
DAAMS	Depot Area Air Monitoring System
DDT	4,4'-dichlorodiphenyltrichloroethane
DDTr	DDT and related breakdown products
DoD	Department of Defense
DSERTS	Defense Site Environmental Restoration Tracking System
DSHE	Directorate of Safety, Health and the Environment
EA	Edgewood Area
ECBC	Edgewood Chemical Biological Center
ECRD	Environmental Conservation and Restoration Division
EOD	Explosive Ordnance Disposal
ERA	Ecological Risk Assessment
EUL	Enhanced Use Leasing
FFTA	Former Fire Training Area
FS	Feasibility Study
ft^2	square feet
GIS	Geographic Information System
HD	Mustard Gas

HDPE	high-density polyethylene
HEAST	Health Effects Assessment Summary Table
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
LTM	long-term monitoring
LUC	Land Use Control
MCE	maximum credible event
MDE	Maryland Department of the Environment
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
MINICAMS	Miniature Chemical Agent Monitor System
MMR	Military Munitions Rule
MSD	minimum separation distance
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PPE	personal protective equipment
R&D	research and development
RA	remedial action
RAB	Restoration Advisory Board
RAC	Remedial Action Completion
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RfD	reference dose
RG	remedial goal

RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TBC	To Be Considered
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCPU	n,n-bis(2,4,6-trichlorophenyl)urea
TEL	Threshold Effects Level
TRV	toxicity reference values
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UXO	unexploded ordnance
VCS	vapor containment structure
VOC	volatile organic compound
VX	nerve gas
WWI	World War I
WWII	World War II
yd^3	cubic yard

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RECORD OF DECISION

REMEDIAL ACTION AT G-STREET SALVAGE YARD CANAL CREEK STUDY AREA

ABERDEEN PROVING GROUND, MARYLAND EDGEWOOD AREA NATIONAL PRIORITIES LIST (NPL) SITE

SEPTEMBER 2007

PART 1: DECLARATION

1 SITE NAME AND LOCATION

Two areas within the G-Street Salvage Yard [Army Environmental Database – Restoration (AEDB-R) Site EACC1A-B] have been designated for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial action under this Record of Decision (ROD). The G-Street Salvage Yard is located in the north-central portion of the Canal Creek Study Area (CCSA; *see Figure 1, p. 9)* of the Edgewood Area (EA) of Aberdeen Proving Ground (APG), Edgewood, Harford County, Maryland, approximately 2,000 feet from the installation boundary and adjacent to the Route 24 main gate *(see Figure 2, p. 11)*. The G-Street Salvage Yard is a triangle-shaped, fenced area of approximately 15 acres, with maximum dimensions of 1,200 feet north to south by 1,000 feet east to west *(see Figure 3, p. 13)*.

For the purposes of this ROD, the G-Street Salvage Yard is divided into two areas:

- Area 1: Salvage Yard Soil Area
- Area 2: Burn Residue Disposal Area (BRDA)

This ROD addresses only contaminated soil and buried materials present at these areas. Groundwater at the G-Street Salvage Yard Site will be addressed under a separate remedial response process.

In the Salvage Yard Soil Area, past salvage and training operations have impacted the surface soils. The primary contaminants found in the surface soils include metals and polychlorinated biphenyls (PCBs). At the BRDA, surface soils are contaminated primarily with metals and buried burn residue material from downrange burning operations, potentially containing unexploded ordnance (UXO) and/or chemical warfare materiel (CWM).

Remedial action is required at the Salvage Yard Soil Area and BRDA to address unacceptable risk to human health and ecological receptors due to hazardous substances and safety hazards associated with potential UXO/CWM.

The United States Environmental Protection Agency (USEPA) Superfund Site Identification Number for APG-EA is MD 2210020036. The G-Street Salvage Yard will be listed in the CERCLA Information System (CERCLIS) database under Operable Unit (OU) 14. The site owner and lead agency is the Army, with USEPA as the support agency and the Maryland Department of the Environment (MDE) as the state regulatory agency.

Future RODs will be developed to address the 33 remaining soil sites at CCSA, groundwater contamination within the Canal Creek Aquifer (CCA) in the West Canal Creek Area [west of the groundwater divide, as illustrated in Figure 1-10 of the Feasibility Study], and sediment and marshes associated with Canal Creek and Kings Creek. Groundwater contamination within the CCA in the East Canal Creek Area [east of the groundwater divide] is currently being captured and treated at the Canal Creek Groundwater Treatment Plant, in accordance with the ROD signed in July 2000.

2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedies for the two areas within the G-Street Salvage Yard in the CCSA, Edgewood, Maryland, which were chosen in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record file for this site.

The State of Maryland concurs with the Selected Remedies.

3 ASSESSMENT OF THE AREAS

The response actions selected in this ROD are necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants into the environment.

4 DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy for both the Salvage Yard Soil Area and for the BRDA is Excavation with Off-Site Disposal and Land Use Controls (LUCs). This remedy includes the following elements.

Salvage Yard Soil Area

- UXO clearance within the excavation footprint by explosive ordnance disposal (EOD) technicians prior to excavation of soil.
- Excavation of approximately 6,339 cubic yards (yd^3) of contaminated surface soil (0 to 2 feet below ground surface [bgs]) exceeding industrial and ecological remedial goals (RGs). A maximum of 2 feet of surface soil will be removed.
- On-site management of potentially contaminated and contaminated soil. All potentially contaminated soil will be handled on-site as hazardous waste until sampling indicates otherwise. Potentially contaminated soils will be stored in bermed areas on an impermeable membrane (e.g., polyethylene sheeting) to prevent run-on and subsurface contamination. Soil piles will be covered with an impermeable cover (e.g., polyethylene sheeting), inspected, and maintained until final disposition.

- Post-excavation confirmation sampling to ensure that contaminated surface soil has been removed to a depth of 2 feet, and to document areas requiring LUCs (where contaminants exceed applicable RGs below 2 feet), if necessary.

- Management of contaminated soil. Soil will be disposed at an appropriate disposal facility in compliance with applicable environmental laws and as determined based on the results of the soil sample analyses.

- Site restoration/revegetation: activities will include backfill of the excavation to within three inches of original grade with clean soil, and finished with topsoil along with seed and mulch over the clean soil layer. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance.

- Implementation of LUCs prohibiting residential land use and soil disturbance at a depth greater than 2 feet if contamination is present at levels exceeding RGs. The approximate extent of LUCs is shown in *Figure 3, p. 13*.

- CERCLA 121(c) Five-Year Reviews will be conducted to assess the long-term effectiveness of the remedy (including the LUCs) until chemicals of concern in the soil are detected at levels that allow for unlimited use and unrestricted exposure.

Burn Residue Disposal Area (BRDA)

- Due to the potential presence of UXO/CWM in the BRDA, excavation and removal of materials will be conducted under the strict Army safety requirements of a UXO/CWM removal action. All intrusive operations into the BRDA burn residue material will be performed in a vapor containment structure (VCS) to contain a potential CWM release from a chemical agent bomblet.

- Removal of the existing safety cover using low ground pressure earthmoving equipment. This safety cover consists of clean sand and other materials, and will be handled on-site as clean material unless otherwise indicated by visual observations, sampling, or as indicated in the Remedial Design.

- Excavation of approximately 533 yd^3 of contaminated surface soils (0 to 2 feet bgs) using low ground pressure earthmoving equipment and excavation of an estimated 2,800 yd^3 of BRDA burn residue material. All excavation activities will be conducted by qualified EOD technicians due to the potential for encountering UXO/CWM. Soil will be both hand and mechanically excavated, cleared of potential UXO/CWM, and containerized. The VCS will be outfitted with an air filtration system to maintain a negative air pressure and remove an agent vapor release if one were to occur. An extensive air monitoring program will be established to ensure worker and public safety. Real-time monitoring of meteorological conditions and audio/video monitoring of the excavation team activities will be performed. Excavation workers inside the VCS will wear Level A personal protective equipment to protect against potential exposure to CWM.

  Sloping or benching will be required for excavation depths below 4 feet in accordance with Occupational Safety and Health Administration (OSHA) requirements. All contaminated soil/material removed from the BRDA and certified free of UXO/CWM will be turned over to the on-post hazardous waste contractor for transport to a treatment facility for disposal. Any UXO/CWM materials encountered will be turned over to the U.S. Army 22nd Chemical Battalion Technical Escort (TE) for disposal.

- On-site management of potentially contaminated and contaminated soil. All potentially contaminated soil will be handled on-site as hazardous waste until sampling indicates otherwise. Potentially contaminated soils will be stored in bermed areas on an impermeable membrane (e.g., polyethylene sheeting) to prevent run-on and subsurface contamination, or will be stored in roll-off containers. Soil piles and roll-off containers will be covered with impermeable covers, inspected, and maintained until final disposition.

- Management of contaminated soil and materials. Soil will be disposed at an appropriate disposal facility in compliance with applicable environmental laws and as determined based upon the results of the soil sample analyses.

- Sampling to determine the extent of surface soil excavation in the BRDA surface soils area. This area will be excavated to 2 feet bgs.

- Confirmation sampling in the BRDA burial area to ensure that contaminated soil has been removed to below applicable RGs.

- Site restoration/revegetation. Activities will include backfill of the excavation to original grade with clean soil, topsoil, and seed and mulch. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance.

- Implementation of LUCs prohibiting residential land use and soil disturbance at a depth greater than the excavation depth if contamination is present at levels exceeding the RGs. The approximate extent of LUCs is shown in *Figure 3, p. 13*.

- CERCLA 121(c) Five-Year Reviews will be conducted to assess the long-term effectiveness of the remedy (including the LUCs) until chemicals of concern (COCs) in the soil are detected at levels that allow for unlimited use and unrestricted exposure.

The Selected Remedy for the Salvage Yard Soil Area is Soil Excavation and Off-Site Disposal; the Selected Remedy for the Burn Residue Disposal Area is Excavation and Off-Site Disposal. Both Selected Remedies include Land Use Controls. By removing contaminated soil and implementing Land Use Controls, the Selected Remedies for the Salvage Yard Soil Area and BRDA meet the requirements of CERCLA and the NCP and will: i) prevent ecological exposure to soil containing mean concentrations of COCs in excess of RGs; ii) prevent residential exposure to hazardous substances in soil that may pose unacceptable risk; and iii) prevent transport and migration of site COCs to nearby marshes and/or creeks. It is the lead agency's current judgment that the Selected Remedies identified for the two areas included in this ROD are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

5 PRINCIPAL THREAT WASTES

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should an exposure occur (OSWER 9380.3-06FS). UXO and CWM are principal threats for the BRDA.

Anticipated UXO/CWM that may be encountered in the BRDA are based on the items recovered during previous removal activities in this area. During an interim removal action in 1990 at the BRDA, scrap metal, WWII-era gas masks, underground storage tanks, UXO, chemical bomblets, munitions debris, drums with detectable traces of HD and VX, a glass vial containing a small amount of liquid contaminated with VX, and other miscellaneous items were recovered. Based on the items recovered during the interim removal action, the threat exists for additional UXO and chemical munitions to be present at the BRDA. Potential UXO items include 2.36-inch rockets, rifle grenades, projectile fuzes, white phosphorus igniters, and bursters. Potential CWM includes M125 and M134 chemical bomblets (which could contain GB), and glass vials or containers with VX or HD.

6 STATUTORY DETERMINATIONS

The Selected Remedies for the two subject G-Street Salvage Yard areas are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

The Selected Remedies for the two subject G-Street Salvage Yard areas do not satisfy the statutory preference for treatment as a principal element of the remedies, but rely on removal and off-site disposal of contaminated soil and materials.

Because the Selected Remedies may result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be required. Generally, this review is conducted within 5 years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment. At APG, USEPA Region III and USEPA Headquarters have determined that basewide Five-Year Reviews are appropriate rather than OU-based Five-Year Reviews. Therefore, the review of the Salvage Yard Soil Area and BRDA at the G-Street Salvage Yard site will be conducted as part of the APG basewide Five-Year Reviews. The next APG basewide Five-Year Review will be conducted in October 2008. Additionally, LUCs will be implemented to prevent future military family housing, elementary and secondary schools, child care facilities, playgrounds, and non-military residential land use from being constructed at the site.

7 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the CCSA.

- COCs and their respective concentrations.

- Baseline risk represented by the COCs.
- RGs established for COCs and the basis for these goals.
- How source materials constituting principal threats will be addressed.
- Current and reasonably anticipated future land use assumptions and potential land use that will be available as a result of the Selected Remedies. Note that groundwater contamination will be addressed under a separate remedial response process.
- Estimated capital, operation and maintenance (O&M), and total present worth costs, and the number of years over which the remedy cost estimates are projected.
- Key factor(s) that led to selecting the remedy (i.e., describes how the Selected Remedies provide the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision).

8 AUTHORIZING SIGNATURES

The appropriate approval authority for this action is the Commander, U.S. Army Environmental Command.

25 Sep 07

Michael P. O'Keefe
Colonel, U.S. Army
Commanding, U.S. Army Environmental Command

Date

9/27/07

James J. Burke
Director
Hazardous Site Cleanup Division
U.S. Environmental Protection Agency, Region III

Date

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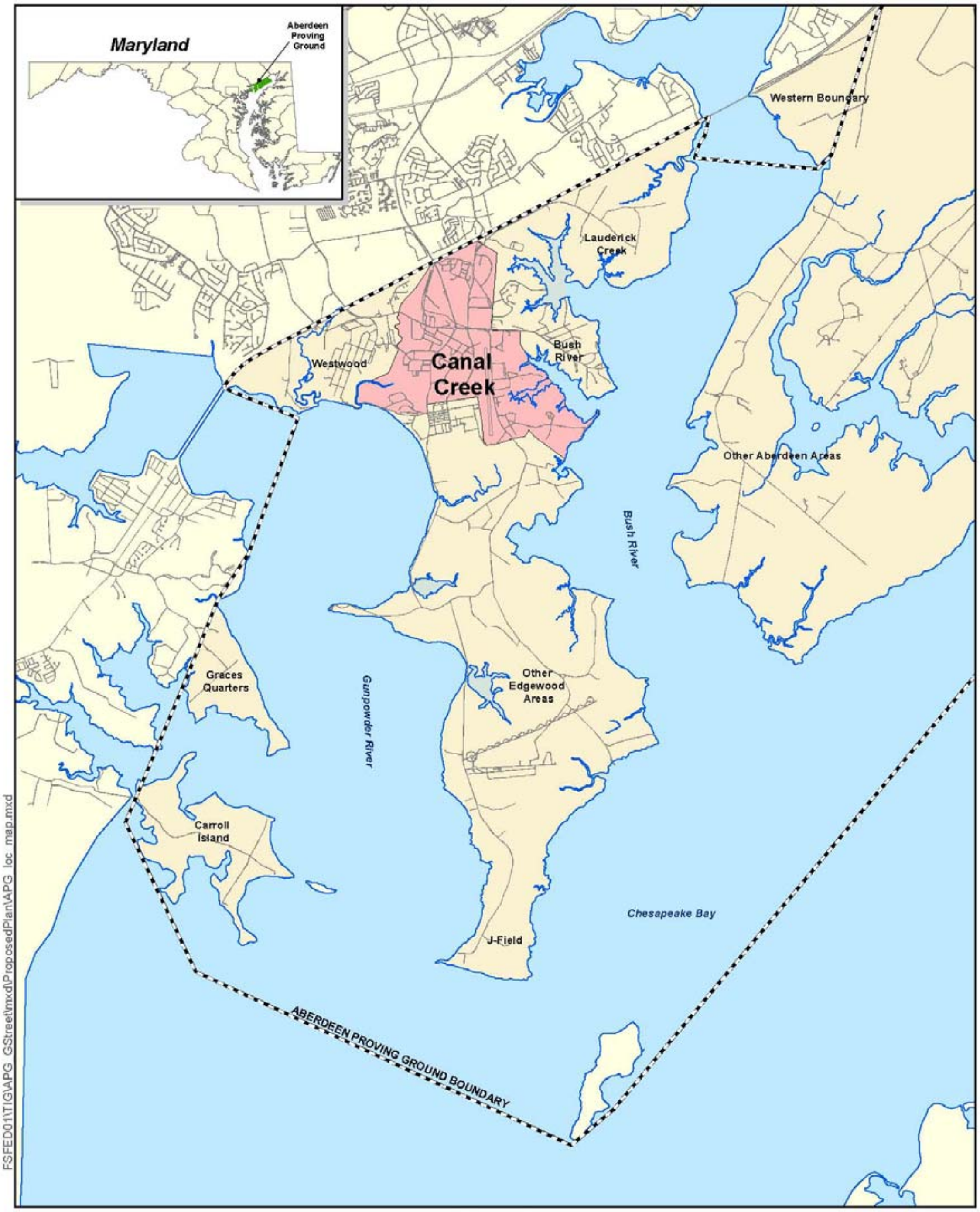

Figure 1
Location of Canal Creek Study Area
Edgewood Area
APG, MD

Figure 1. Location of Canal Creek Study Area

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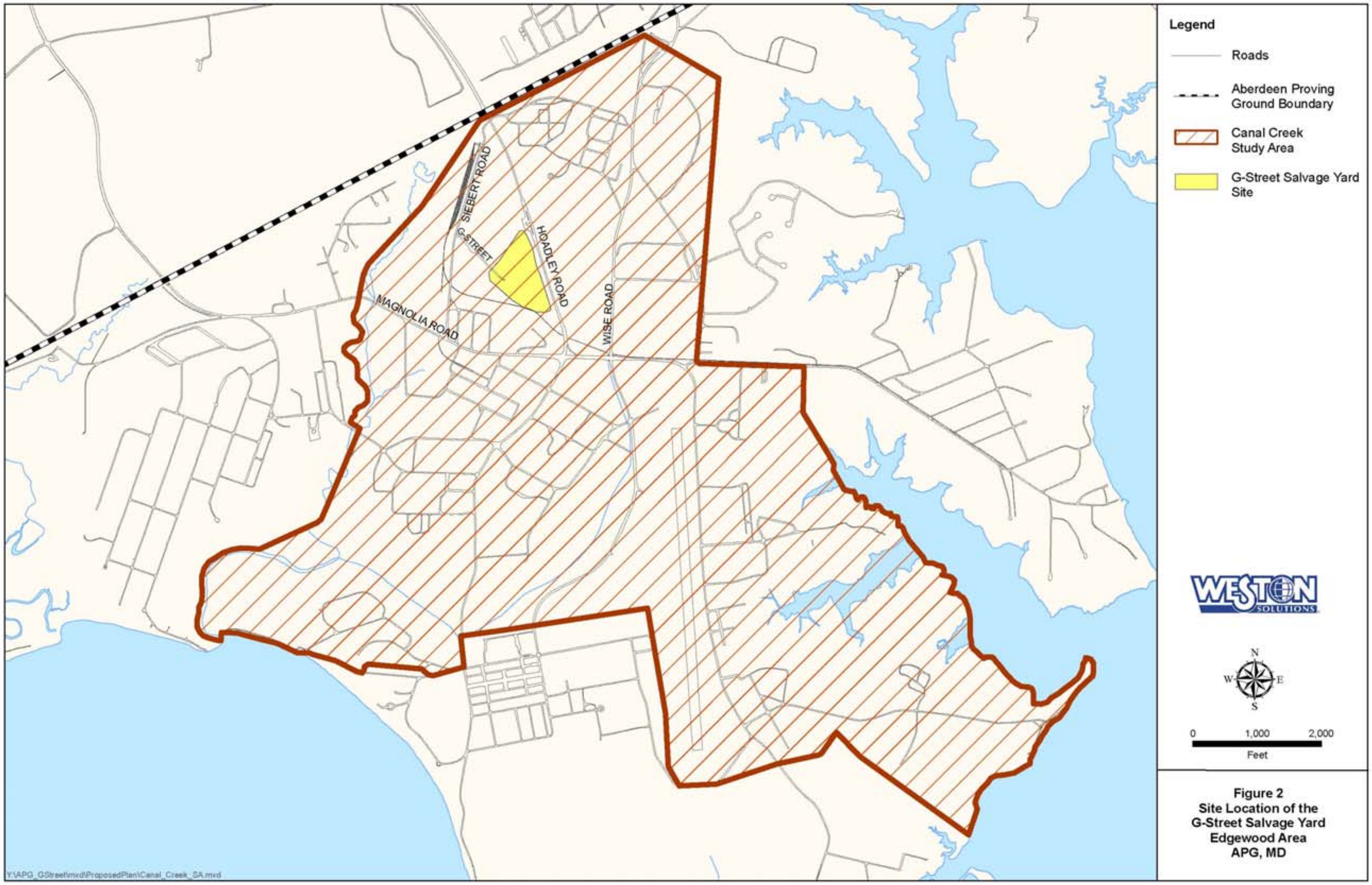

Figure 2. Site Location of the G-Street Salvage Yard

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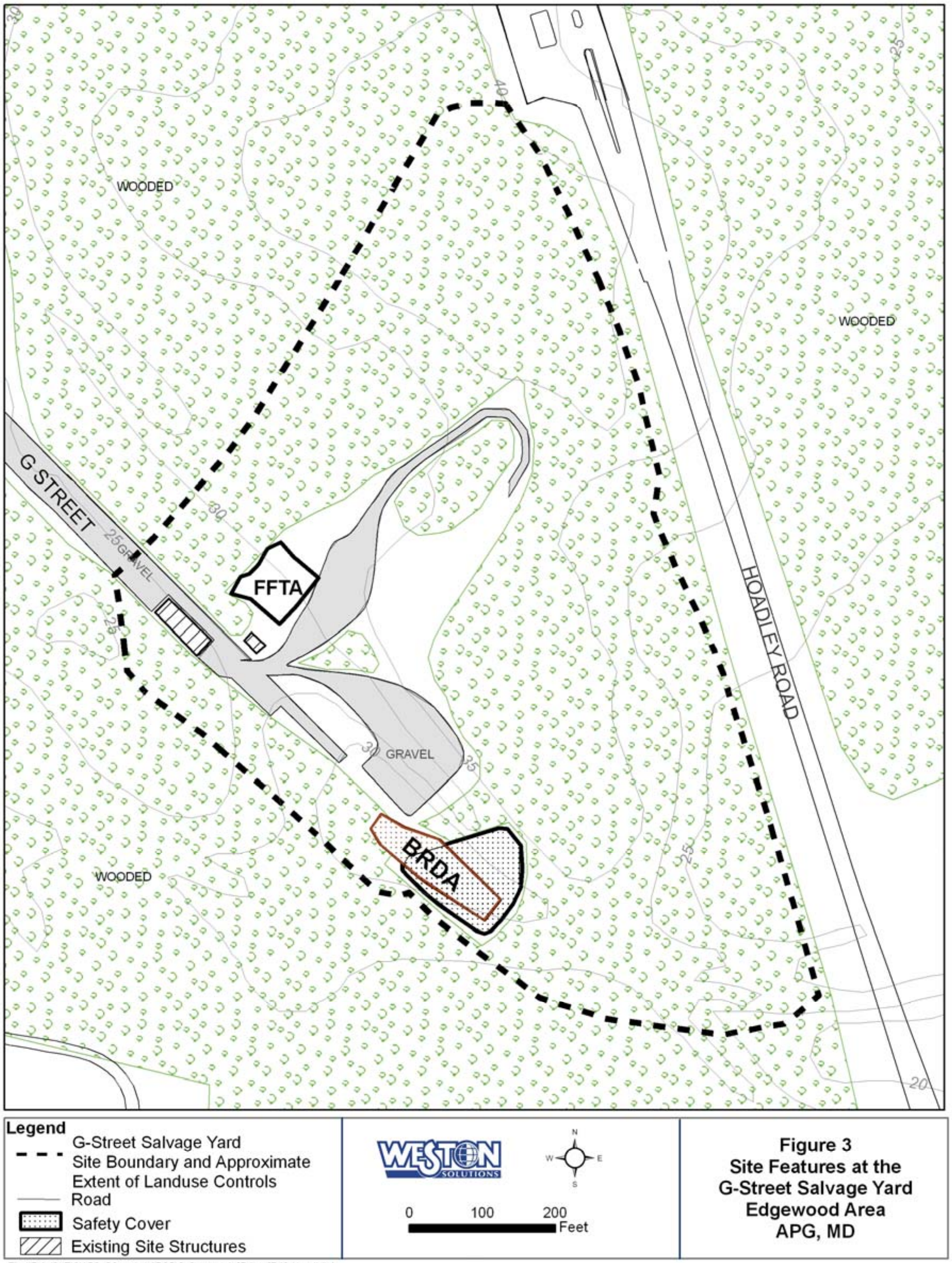

Figure 3. Site Features of the G-Street Salvage Yard

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PART 2: DECISION SUMMARY

1 SITE NAME, LOCATION, AND DESCRIPTION

APG is a 72,500-acre Army installation located on the western shore of the upper Chesapeake Bay in southern Harford County and southeastern Baltimore County, MD. The installation is bordered to the east and south by the Chesapeake Bay; to the west by Gunpowder Falls State Park, the Crane Power Plant, and residential areas; and to the north by the City of Aberdeen and the towns of Joppa, Edgewood, and Abingdon. The Bush River divides APG into two distinct areas: the Edgewood Area to the west, and the Aberdeen Area to the east.

Since 1917, the Edgewood Area (*Figure 1, p. 9*) has been a center for research, development, testing, and manufacture of military-related chemicals and chemical agents. The G-Street Salvage Yard is located in the Edgewood Area of APG, which is listed on the National Priorities List (NPL). The NPL is the USEPA list of hazardous waste sites that have been identified as priorities for remedial evaluation and response.

The G-Street Salvage Yard is located in the north-central portion of the Canal Creek Study Area, approximately 2,000 feet from the installation boundary and adjacent to the Route 24 main gate to the Edgewood Area of APG *(Figure 2, p. 11)*. The Salvage Yard is a triangle-shaped, fenced area of about 15 acres, with approximate maximum dimensions of 1,200 feet north to south by 1,000 feet east to west *(Figure 3, p. 13)*.

The site was originally used as the World War I (WWI) Railroad Yard until the World War II (WWII) Railroad Yard was constructed at a nearby location. Salvage yard operations at the site were conducted from the 1940s until the late 1960s, and operations primarily included scrap wood and metal recycling, including a smelting operation for lead reclamation. Fire training was also conducted at the Salvage Yard at the Former Fire Training Area (FFTA) located in the western portion of the site *(Figure 3, p. 13)*. An earthen fire training pit was operated in the FFTA from approximately 1972 to 1978; this area was located within the boundaries of the Salvage Yard Soil Area.

The BRDA, located in the southern portion of the site *(Figure 3, p. 13)*, received residue from burn pit disposal operations reportedly conducted in the APG downrange areas of New O-Field and J-Field. The ash and metal residue were transported to the Salvage Yard for scrap metal recovery and sale. UXO/CWM may have been transported and deposited at the BRDA along with the residual burn material from the downrange areas.

The two G-Street areas, which were formerly industrial sites, are identified in USEPA CERCLIS database as MD 2210020036 (APG-EA NPL Site). The site owner and lead agency is the Army, with USEPA as the support agency and MDE as the state regulatory agency. The G-Street cleanup will be funded by the U.S. Department of Defense, U.S. Army.

2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants from this site.

2.1 Site History

Operations were conducted at the G-Street Salvage Yard from the 1940s until the late 1960s, and included primarily scrap wood and metal recycling, including a smelting operation for lead reclamation. The BRDA, located in the southern portion of the G-Street Salvage Yard *(Figure 3, p. 13)*, received residue from burn pit disposal operations reportedly conducted in the APG downrange areas of New O-Field and J-Field. The ash and metal residue was transported to the G-Street Salvage Yard for scrap metal recovery and sale. UXO/CWM may have been transported and deposited at the BRDA along with the residual burn material from the downrange areas.

In 1990, a removal action was conducted at the G-Street Salvage Yard BRDA to remove wastes and materials that posed a risk to human health and the environment. This removal action included a surface sweep and removal of potential UXO and CWM. Recovered material during the 1990 removal action included scrap metal, WWII-era gas masks, underground storage tanks, UXO, bomblets, munitions debris, drums with detectable traces of distilled mustard (HD) and nerve agent (VX), a glass vial containing a small amount of liquid contaminated with VX, and other miscellaneous items. The bomblets encountered during the removal action were located in or near the BRDA. Based on the results of the 1990 removal action, physical security measures were implemented in 1991 to prevent access.

In 1996, a temporary, 2-foot thick, permeable sand safety cover was constructed over the BRDA as an interim action to protect human health and the environment from potential hazardous substances and UXO/CWM that may be buried in the area. Prior to and during the installation of the safety cover, another UXO surface sweep was conducted over the BRDA. The majority of surface anomalies encountered during the sweep were non-UXO related. Munitions-related items that were recovered in the Salvage Yard were similar to items found during the 1990 removal action, and were primarily found in the vicinity of the BRDA. Following the installation of the BRDA safety cover, a 1998 geophysical survey conducted at the BRDA detected what is believed to be buried burn residue extending farther west, beyond the boundary of the safety cover *(Figure 3, p. 13)*.

2.2 Enforcement Activities

In September 1986, USEPA issued a Resource Conservation and Recovery Act (RCRA) Part B permit to APG. This permit required the assessment of Solid Waste Management Units (SWMUs) at APG due to their potential for release of contaminants to the environment. Studies performed within the guidelines of the RCRA permit identified the CCSA as one of the four areas that contained SWMUs.

As a result of findings from these studies, APG-EA was placed on the NPL in February 1990. The Department of the Army and USEPA Region III entered into a Federal Facilities Agreement on 27 March 1990 that subjected APG to RCRA corrective action and CERCLA remedial action requirements for the contaminated sites (USEPA Region III and U.S. Army, 1990). The APG Directorate of Safety, Health and the Environment (DSHE) implements the Installation Restoration Program (IRP) to fulfill the requirements of the Federal Facilities Agreement. The designations for sites under the purview of CERCLA and the IRP were later changed from SWMUs to Defense Site Environmental Restoration Tracking System (DSERTS) sites [which are now referred to as Army Environmental Database – Restoration (AEDB-R) sites].

Under USEPA and MDE oversight, a Remedial Investigation (RI) and Feasibility Study (FS) have been finalized for the G-Street Salvage Yard. The RI began in 1993 and was finalized in December 2003 [Shaw Environmental, Inc. (Shaw)]. The RI report details the results of the field activities to characterize the nature and extent of contamination, the fate and transport of contaminants, and the results of the baseline risk assessment. The FS report was finalized in May 2005 (Shaw, 2005) and evaluated cleanup alternatives for the site and developed site-specific remedial goals for contaminants. The cleanup alternatives were based on a future residential land use of the site based on the conservative assumption that the site could potentially be leased for unrestricted reuse (i.e., residential/daycare). This assumption in turn was based on the APG Master Plan, which identified enhanced use leasing as the future land use for this site. Subsequent to the FS finalization, the Army determined that a more reasonably anticipated future land use for the site is industrial. As a result of this decision, an additional appendix (Appendix G) to the Final FS (WESTON, 2007a) was completed to analyze and compare cleanup alternatives for the G-Street Salvage Yard based on future industrial land use. In addition, WESTON (2007b) conducted supplemental soil sampling and analyses for metals and other parameters at four locations in the vicinity of a sample that previously indicated concentrations of some metals in exceedance of regulatory criteria. The results of this soil sampling event did not indicate the presence of these metals in concentrations posing unacceptable risk to human health or the environment.

Risk Assessments

- *Three Sites in Canal Creek Ecological Risk Assessment, Data Evaluation and Risk Characterization* [EA Engineering, Science, and Technology, Inc. (EA), 2004]

RI and FS Reports

- *Canal Creek Study Area Remedial Investigation Progress Report* [Jacobs Engineering Group, Inc. (JEG), 1995]
- *Phase II Remedial Investigation Report for IRP Sites 2, 6, and 46 in Canal Creek Area* (Shaw, 2003) – including Human Health Risk Assessment (HHRA)
- *3 Sites in Canal Creek Study Area Feasibility Study* (Shaw, 2005)
- *Supplemental Investigation Results at Former Soil Boring SB46013 for G-Street Salvage Yard* (WESTON, 2007b)
- *Appendix G, 3 Sites in Canal Creek Study Area Feasibility Study* (WESTON, 2007a)

Individual site descriptions and site histories are provided in Section 5.

3 COMMUNITY PARTICIPATION

CERCLA Sections 113(k)(2)(B) and 117, Department of Defense, and Army policy require the involvement of the local community as early as possible and throughout the IRP process. To accomplish this, APG is conducting monthly Restoration Advisory Board (RAB) meetings and periodic public meetings at each decision point in the CERCLA remedial process [U.S. Army Environmental Center (USAEC), 1998]. The RAB membership is comprised of both Army and local community members. Information regarding the Salvage Yard Soil Area and BRDA was presented to the RAB several times over the last few years, including a final presentation on 29 March 2007. The FS for the Salvage Yard Soil Area and BRDA was finalized on 26 May 2005. An appendix to the FS, Appendix G, was finalized in May 2007.

The Proposed Plan was made available to the public on 25 June 2007. The Administrative Record, which contains the information used to select the remedy, may be found at the Aberdeen and Edgewood Branch of the Harford County Public Library and at the Miller Library at Washington College in Chestertown, Maryland. The notice of the availability of these documents was published in *The Aegis*, *Cecil Whig*, and *The Avenue* on 20 June 2007 and *Kent County News* and *East County Times* on 21 June 2007. A copy of the newspaper ad is provided in the Responsiveness Summary (Part 3) of this ROD. The public meeting was held on 25 June 2007. During the public meeting, the floor was opened to discuss the Selected Remedies and future land uses. The public comment period was held from 25 June 2007 to 8 August 2007. A meeting summary and responses to the public comments received during the public comment period are included in the Responsiveness Summary (Part 3) of this ROD. In addition, a digital recording of the 25 June 2007 public meeting has been placed in the Administrative Record, available at the locations specified above.

4 SCOPE AND ROLE OF RESPONSE ACTION

As mentioned previously, the CCSA contains over 50 AEDB-R sites. RODs have already been approved for the following sites:

➢ Building 103 Dump	(EACC1H-E)	February 1995
➢ Building 503 Smoke Mixture Burning Sites	(EACC1L-A)	April 1995
➢ Beach Point Test Site Groundwater	(EACC3N)	September 1997
➢ Canal Creek Aquifer in the East Canal Creek Area	(EACC4A)	July 2000

Future RODs will address the remaining soil sites at CCSA, groundwater contamination within the CCA in the West Canal Creek Area (including the G-Street Salvage Yard), and sediment and marshes associated with Canal Creek and Kings Creek. This ROD addresses the final response action for the two G-Street Salvage Yard soil areas.

Two previous remedial actions at the G-Street Salvage Yard BRDA were intended as interim actions to protect human health and the environment.

- 1990 – removal of potential UXO and CWM

- 1996 – installation of a temporary safety cover

No previous remedial actions were completed at the Salvage Yard Soil Area.

To date, the vapor intrusion pathway has not been evaluated at the site. Since vapor intrusion has not been evaluated at the site, the Army commits to:

- Complying with its November 2006 interim vapor intrusion policy (Army, 2006) in the future during the site's groundwater investigation.
- Evaluating aggregate risk for vapor intrusion for groundwater and soil pathways.

The results of the vapor intrusion investigation and risk assessment will be addressed in the West Canal Creek Aquifer groundwater ROD.

The Selected Remedy for both areas is Excavation and Off-Site Disposal with Land Use Controls and CERCLA Five-Year Reviews. The Land Use Controls will allow only industrial or commercial future land uses. The Selected Remedies will eliminate the need for future remedial actions.

5 SITE CHARACTERISTICS

The G-Street Salvage Yard includes two areas requiring cleanup of soils (Salvage Yard Soil Area and BRDA) and groundwater that contains a volatile organic compound (VOC) plume. The groundwater contamination will be addressed under a separate ROD. The Salvage Yard Soil Area is approximately 2 acres, the BRDA is approximately 0.35 acre, and the entire G-Street Salvage Yard is approximately 15 acres.

Access to the Salvage Yard is from the G-Street gravel road that runs from Siebert Road to the Salvage Yard fence gate. The only permanent structure remaining at the site is a concrete structure south of the Former Fire Training Area (FFTA), which was likely used as a loading dock. Two temporary buildings are currently present on the site: a vacant modular trailer, and a storage shed sitting on the former loading dock *(Figure 3, p. 13)*.

The Salvage Yard has relatively flat topography with elevations ranging from about 25 to 40 feet above mean sea level. The topographic high is in the northern portion of the site, and the topography slopes primarily in a southwest direction. Surface runoff via overland flow around G-Street collects in shallow drainage ditches or natural low areas, and is transported off-site to drainage features associated with bounding roads (e.g., ditches and culverts). Surface water and sediment are not present at this site.

Approximately 80% of the G-Street Salvage Yard is mixed hardwood forest dominated by oaks, American beech and Virginia pine, and an understory of American holly and sassafras. The remaining 20% of the site is open area that was formerly used during salvage operations and is covered by gravel or grasses.

The G-Street Salvage Yard habitat likely supports a mammalian population similar to that found in wooded and/or grassy areas throughout APG. Mammals likely to utilize the habitat at the site include the opossum, masked shrew, short-tailed shrew, raccoon, gray squirrel, white-footed mouse, meadow vole, eastern cottontail, and whitetail deer. Upland birds that may be encountered at the site include the bobwhite quail, woodcock, red-winged blackbird, and American robin. Red-tailed hawk, marsh hawk, and other raptors may also use the habitat at the Salvage Yard. There are no endangered flora or fauna species known to exist at the site.

The G-Street Salvage Yard is located within the Atlantic Coastal Plain Physiographic Province. The near surface geology of the site is dominated by clays and silts comprising an upper confining unit. The upper confining unit is present from the ground surface to a depth ranging from approximately 20 to 25 feet below the ground surface at the Salvage Yard. Based on borings conducted at the site, the upper confining unit is composed of silty fine sands in the shallow horizon and clayey silts with moderate to high plasticity at depth.

Two aquifers have been identified beneath the G-Street Salvage Yard: the Canal Creek Aquifer (located below the upper confining unit) and the Lower Confined Aquifer. There is no surficial aquifer present at the site. The Canal Creek Aquifer exists under confined conditions beneath the Salvage Yard due to the upper confining unit. The Canal Creek Aquifer is approximately 30 feet thick at the site and dips to the south-southwest. The clay-rich upper confining unit underlying the Salvage Yard limits COC migration to the Canal Creek Aquifer.

The following soil sampling events occurred at the G-Street Salvage Yard, including both the Salvage Yard Soil Area and the BRDA:

- 1995, Phase I RI, Jacobs Engineering: Four soil samples were collected. Benzo(a)pyrene, benzo(b)fluoranthene, arsenic, barium, cadmium, chromium, copper, iron, lead, and antimony were detected above Risk-Based Concentrations (RBCs). N,n-bis(2,4,6-trichlorophenyl)urea (TCPU), which has no RBC, was also detected.

- 1996, Emergency Measures Action, EA Engineering: Fifteen soil samples were collected. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h) anthracene, heptachlor epoxide, Aroclor 1260, arsenic, aluminum, antimony, chromium, copper, iron, lead, and manganese were detected above RBCs. Delta-BHC, which has no RBC, was also detected.

- 1998, Phase II RI, Shaw: Dibenz(a,h)anthracene, benzo(a)pyrene, 4,4'-DDE, 4,4'-DDT, heptachlor, Aroclor 1254, Aroclor 1260, aluminum, antimony, arsenic, barium, cadmium, mercury, chromium, copper, iron, lead, manganese, silver, thallium, vanadium, and zinc were detected above RBCs.

- 2007, Supplemental Investigation, Weston Solutions, Inc.: Soil samples were collected from four Geoprobe locations in the vicinity of a previous soil boring (SB46013) to verify concentrations of cadmium, lead, and antimony detected during that investigation. Results of analyses did not indicate the presence of these metals in concentrations exceeding cleanup levels.

Groundwater sampling was conducted at the G-Street Salvage Yard as follows:

- 1976-1979 Environmental Contamination Survey, U.S. Army Environmental Center (USAEC): Groundwater samples were analyzed for CWM, white phosphorus, arsenic, base neutral acids, inorganics, and VOCs. No contamination was identified.
- 1985-1989 Hydrogeologic Assessment, U.S. Geological Survey (USGS): Groundwater samples were collected throughout the Canal Creek Study Area. Results of analyses on samples collected in the G-Street Salvage Yard indicated the presence primarily of VOCs in the groundwater beneath the site.
- 1993-1995 Phase I Remedial Investigation (Jacobs Engineering Group): Seven wells in the G-Street Salvage Yard were sampled. Results of analyses indicated the presence of VOCs, pesticides, and metals in concentrations above cleanup levels.
- 1996-2004 Phase II Remedial Investigation (Shaw): 14 wells were sampled in the G-Street Salvage Yard. Results were consistent with previous sampling events.

Salvage Yard Soil Area

Due to former salvage and training operations, surface soil to a depth of approximately 2 feet bgs in the former Salvage Yard operational areas was found to contain elevated levels of metals, polycyclic aromatic hydrocarbons (PAHs), PCBs, pesticides, and dioxins/furans.

The baseline risk assessment identified several metals and PAHs, PCBs, and dioxins as chemicals of concern (COCs) in soil that present an unacceptable risk to future industrial workers. Lead, zinc, DDT, and PCBs were identified as COCs in soil that present an unacceptable risk to ecological receptors. The estimated lateral extent of surface soil contamination in the Salvage Yard Soil Area is presented in *Figure 4, p. 59*. The estimated volume of soil to be excavated is 6,339 yd^3.

Burn Residue Disposal Area

Scrap metal from open-burning-pit disposal operations at the New O-Field and J-Field areas of APG-EA was processed through the G-Street Salvage Yard for scrap metal reclamation. The extent of buried residue material at the Salvage Yard was investigated in 1998 using non-intrusive geophysical methods. The estimated lateral extent of residue material based on electromagnetic survey is presented in *Figure 5, p. 61*. Locations depicted in red represent higher magnetic response areas. The insert in *Figure 5, p. 61* shows the results of the ground penetrating radar survey, which provides an estimated average depth of the subsurface material of 2.5 meters, or 8.3 feet bgs.

In addition to the subsurface BRDA material, surface soil in the vicinity of the BRDA was found to contain elevated levels of metals, PAHs, PCBs, and pesticides. The baseline risk assessment specifically identified arsenic and copper as COCs above background that present an unacceptable risk to future industrial workers and lead, zinc, DDT, and PCBs as ecological COCs. The estimated extent of burn residue material and surface soil contamination in the BRDA area is presented in *Figure 4, p. 59*. The estimated volume of contaminated material to be excavated is 3,382 yd^3.

Anticipated UXO/CWM that may be encountered in the BRDA is based on the items recovered during previous removal activities in this area. During an interim removal action in 1990 at the BRDA, scrap metal, WWII-era gas masks, underground storage tanks, UXO, chemical bomblets, munitions debris, drums with detectable traces of HD and VX, a glass vial containing a small amount of liquid contaminated with VX, and other miscellaneous items were recovered. Based on the items recovered during the interim removal action, the threat exists for additional UXO and chemical munitions to be present at the BRDA. Potential UXO items include 2.36-inch rockets, rifle grenades, projectile fuzes, white phosphorus igniters, and bursters. A vial containing a liquid with trace amounts of VX and chemical bomblets containing liquid fill have been found at the BRDA in the past and have been destroyed by the Army. Potential CWM includes M125 and M134 chemical bomblets, and glass vials or containers with VX or HD.

5.1 Conceptual Site Model for Salvage Yard Soil Area and BRDA

Narrative and tabular Conceptual Site Models (CSMs) were developed as part of the risk assessments for the G-Street Salvage Yard Areas. These CSMs identified the primary sources, primary contaminated media, migration pathways, exposure pathways, and potential human and ecological receptors, and were based upon the data presented in the RI/FS documentation (Shaw, 2003; Shaw, 2005). A consolidated, graphic Conceptual Site Model (*Figure 6, p. 63*) for the Salvage Yard Soil Area and BRDA was developed for this ROD based upon the narrative and tabular CSMs presented in the RI/FS documents. This consolidated CSM identifies the primary sources, primary contaminated media, migration pathways, exposure pathways, and potential human and ecological receptors that were evaluated as part of the RI/FS for both sites at the G-Street Salvage Yard. The RI/FS source documents are discussed in Section 2, and are available in the Administrative Record.

5.1.1 Primary Sources and Release Mechanisms for the G-Street Salvage Yard Areas

The primary sources that were suspected and evaluated in the RI for the Salvage Yard Soil Area primarily included scrap wood and metal recycling, including a smelting operation for lead reclamation. The primary sources for the BRDA included buried burn residue from burning activities reportedly conducted in the APG downrange areas of New O-Field and J-Field. UXO/CWM may have been transported and deposited at the BRDA along with the residual burn material from downrange areas. The primary release mechanisms for these areas are spillage/deposition to surface soil and burial of the burn residue.

5.1.2 Secondary Sources and Release Mechanisms

Secondary sources include surface soil and subsurface soil in the G-Street Salvage Yard. Secondary release mechanisms include dust generation, biotic uptake, and stormwater runoff and erosion for surface soil; and leaching for subsurface soil. The primary route of migration is contaminant release to the soil; infiltration to groundwater, and subsequent groundwater migration. A secondary route of migration is surface water runoff, causing erosion of contaminated soil and transport into nearby drainage areas.

6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Current land use within G-Street includes storage for bulk road construction material. According to the *Draft Aberdeen Proving Ground Strategy 2025* (USACE, 2005), future land use within G-Street is designated as research and development, including laboratory facilities and associated administration. The area may also be considered for Enhanced Use Lease (EUL). Under the EUL process, the Army will seek out private-sector developers and property managers to market and develop/redevelop certain areas or facilities for research and development (R&D), administrative/office, assembly and testing, warehousing, training, and other uses.

The area immediately to the south, the 5100 Block, is also designated for EUL for activities such as Research, Development, Testing, Evaluation, and other activities, specifically targeting Base Realignment and Closure (BRAC) tenants. No land use changes are planned for the areas west (storage and open areas) and east (Route 24 gate) of the G-Street Salvage Yard. The area to the north across the Amtrak railroad tracks is within the jurisdiction of the town of Edgewood.

The closest residential housing for military personnel and their dependents is located on Clearview Drive, east of the Airfield. Off-post residential housing lies approximately 4,000 feet north of the site.

Groundwater underlying the areas at the G-Street site is not discussed in this document, but will be addressed as part of another ROD under AEDB-R Site EACC4A-B (West Canal Creek Area).

7 SUMMARY OF SITE RISKS

As a component of the RI process, risk assessments were performed for the G-Street Salvage Yard areas associated with this ROD. The G-Street Salvage Yard areas were combined with the WWII Railroad Yard and DM Filling Plant sites into the risk assessment documents for *Three Sites in Canal Creek Ecological Risk Assessment* (EA, 2004). The following summaries of the HHRA, Ecological Risk Assessment (ERA), and radiological risk assessments were derived from these documents (listed previously in Section 2).

The RI addressing the Salvage Yard Soil Area and BRDA was completed in December 2003 (Shaw, 2003). Surface and subsurface soils were the primary contaminated media at these areas, respectively[1]. The results of the HHRA cancer risk estimates indicate that risks from future exposures to soil at the two areas are within or below the acceptable risk range for health protectiveness at Superfund sites (1×10^{-6} to 1×10^{-4}) for site workers, excavation workers, and trespassers. The estimated non-carcinogenic hazard index (HI) values for the Salvage Yard Soil Area were above 1 for all considered receptor scenarios, ranging from slightly above 1 to 96 for an excavation worker. The primary contaminants contributing to these elevated HI values are cadmium, chromium, antimony, and Aroclor 1254. For the BRDA, there was only one HI value slightly above 1 for an excavation worker (HI = 2.4). The primary contaminants contributing to this elevated HI are chromium, copper, and iron (Shaw, 2003). In addition to the calculated non-carcinogenic human health risks and ecological risks, potential UXO and CWM deposited with

[1] Groundwater underlying these sites in the CCA is being addressed separately as AEDB-R sites EACC4A (East Canal Creek Area) and EACC4A-B (West Canal Creek Area).

burn residue materials at the BRDA pose a risk to anyone who may come into contact with these materials.

In addition to the HHRA carcinogenic risk and HI estimates, lead in soil was also above the USEPA recommended human health industrial screening value (800 milligrams per kilogram [mg/kg]) at the Salvage Yard Soil Area (USEPA, 2006).

For the hypothetical adult and child residents, the estimated carcinogenic risk from exposure to soil in the Salvage Yard Soil Area was above the acceptable risk range. Additionally, non-carcinogenic HIs were above 1 for both the Salvage Yard Soil Area and BRDA.

In addition to chemical risk evaluation, radiological risk was assessed at the Salvage Yard. Available information on historical operations indicates that there was no past use of radioisotopes at the site. Based on this historical background, sampling results compared to national and regional background data, and geochemical evaluation, it was concluded that the on-site activity levels of the radionuclides are background related.

The eight-step USEPA Ecological Risk Assessment process was completed for the G-Street Salvage Yard to determine if there is potential for ecological receptors to be adversely affected by the presence of hazardous substances. The potential impacts to terrestrial (land) plants, soil invertebrates (animals with no backbone or spinal cord), vermivorous (worm-eating) mammals and birds, and amphibians (animals such as frogs, toads, and salamanders) and reptiles were evaluated in the assessment.

Results of these evaluations indicate that lead, zinc, PCBs, and DDT may be present in concentrations that could have adverse effects on vermivorous mammals and birds at the two areas.

7.1 Summary of Human Health Risk Assessment

7.1.1 Identification of Chemicals of Potential Concern

The risk assessment screening criteria identified chemicals of potential concern (COPCs) for selection and quantitative evaluation in the HHRA, based on a review of the data and comparison to appropriate screening levels. Maximum concentrations of detected chemicals in environmental media were compared to Risk-Based Concentrations (RBCs) where available, in accordance with USEPA Region III guidance. The RBCs are back-calculated using conservative exposure parameters. Those back-calculated from carcinogenic toxicity criteria were used directly as screening criteria, while RBCs back-calculated from non-carcinogenic toxicity criteria were adjusted downward by a factor of 10 for use as conservative screening criteria to account for synergistic effects from multiple potential contaminants.

Human health COPCs identified at the two G-Street areas include one volatile organic compound (chloromethane), two PCBs (Aroclor 1254 and Aroclor 1260), five PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and ideno[1,2,3-c,d]pyrene), five pesticides (delta-BHC, 4,4'-DDE, 4,4-DDT, heptachlor, and heptachlor epoxide), TCPU, total dioxin TEQ, and fifteen metals (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, silver, thallium, vanadium, zinc). A separate screening was conducted to identify COPCs for the soil inhalation exposure pathway. Several constituents were retained because there were no RBCs available for comparison and/or soil screening levels could not be calculated. **Table 1**, p. 65 presents the chemicals of concern data used for the HHRA for the two areas at the G-Street Salvage Yard.

7.1.2 Exposure Assessment

Current land use of the G-Street Salvage Yard is storage of road construction materials. The site is entirely fenced and is located on a military installation. Potentially affected human receptors under current/future land use conditions include site workers (i.e., industrial and construction) and adolescent trespassers.

The potential exposure pathways were evaluated for both current and future land use conditions. The following exposure pathways were quantitatively evaluated under current/future land use conditions:

- Incidental ingestion, dermal absorption, and inhalation of chemicals in surface soil at the Salvage Yard Soil Area and BRDA.

Under future land use conditions, the G-Street Salvage Yard will likely be used for commercial development. The future construction/commercial worker exposures to total soil at certain sites were evaluated in the HHRA. At the time the risk assessments were completed, potential residential future use was being considered. Since that time, the residential use scenario has been eliminated, and only commercial/industrial use is being considered. Under future land use scenarios, the following potential exposure pathways were quantitatively evaluated, excluding future use of groundwater (which will be addressed in a separate ROD for the West Canal Creek Aquifer):

- Incidental ingestion, dermal absorption, and inhalation of chemicals in total soil at the G-Street Salvage Yard by site workers, excavation workers, and trespassers.
- Incidental ingestion, dermal absorption, and inhalation of chemicals in surface soil and total soil at the G-Street Salvage Yard by adult and child residents.

Exposure point concentrations for the COPCs in each medium and both current and future timeframes were derived based on the 95 percent upper confidence limit on the arithmetic mean concentration or the maximum detected concentration, whichever was lower. In cases where fewer than five samples were available, the maximum detected value was used as the exposure point concentration. Average daily doses and other exposure parameters are discussed in detail in Section 9 of the *Phase II Remedial Investigation Report, IRP Sites 2, 6, and 46* (Shaw, 2003). **Table 1**, p. 65 presents the chemicals of potential concern and the exposure point concentrations.

7.1.3 Toxicity Assessment

Chronic toxicity criteria and quantitative dose-response data were obtained from the Integrated Risk Information System (IRIS) (USEPA, 1996b), Health Effects Assessment Summary Tables

(HEAST) (USEPA, 1997), and the National Center for Environmental Assessment for COPCs. Potential risks for some chemicals (e.g., delta-BHC) and essential human nutrients (e.g., calcium, magnesium, potassium, and sodium) could not be quantitatively evaluated in the risk assessment because toxicity data are not available for these constituents; however, exclusion of these chemicals is not anticipated to result in significant underestimates of risk. Available data leads to the conclusion that these chemicals are moderately toxic, and relatively as toxic, or less toxic than the other COPCs for which health effects criteria are available. Toxicity data in the HHRAs are presented by carcinogenic and non-carcinogenic data of each COPC for the oral, dermal, and inhalation exposure routes. **Tables 2 and 3** (pp. 67 and 70) present the cancer toxicity data summary for ingestion and inhalation, respectively. **Tables 4 and 5** (pp. 72 and 75) present the non-cancer toxicity data summary for ingestion and inhalation.

7.1.4 Risk Characterization

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

where: risk = unitless probability (e.g., 2×10^{-5}) of an individual developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(\text{mg/kg-day})^{-1}$

These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as one in three. The generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ ≤ 1 indicates that a receptor's dose of a single contaminant is less than or equal to the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemical(s) of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI ≤ 1 indicates that, based on the sum of all HQ from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI > 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI/RfD}$$

where: CDI = chronic daily intake
RfD = reference dose

CDI and RfD are expressed in the same units, and represent the same exposure period (i.e., chronic, subchronic, or short-term).

Estimated cancer risks for all industrial scenarios at the Salvage Yard Soil Area and BRDA were within or below the acceptable risk range for health protectiveness of 1 x 10^{-6} to 1 x 10^{-4} (**Table 6**, p. 77). With the exception of the site workers in the Salvage Yard Soil Area and future adult excavation workers in the BRDA, the estimated non-carcinogenic HI values for future industrial exposures to soil were all below 1.0 (**Table 7**, p. 82). For the Salvage Yard Soil Area, only chromium had hazard quotients higher than 1.0. Although carcinogenic risks fell within the acceptable risk range of 1 x 10^{-6} to 1 x 10^{-4} for all industrial scenarios for both areas, carcinogenic risks for the hypothetical adult and child residents for the Salvage Yard Soil Area were above the acceptable risk range. In addition, the noncarcinogenic risks for lead for the resident-child from exposure to soil at the G-Street areas exceeded the benchmark of 1.0.

7.1.5 Uncertainty

All risk assessments involve the use of assumptions, judgments, and incomplete data to varying degrees that contribute to the uncertainty of the final estimates of risk. Uncertainties result both from the use of assumptions or models in lieu of actual data and from the error inherent in the estimation of risk-related parameters, and may cause risk to be overestimated or underestimated.

Consequently, the results of these risk assessments should not be construed as presenting an absolute estimate of risk to persons potentially exposed to chemicals at the areas discussed within this ROD.

The primary sources of uncertainty for these assessments are associated with environmental sampling and analysis; selection of chemicals for evaluation; toxicological data; and exposure assessment. For example, analytical accuracy errors or sampling errors can result in rejection of data, which decreases the available data for use in the HHRA, or in the qualification of data, which increases the uncertainty in the detected chemical concentrations. Also, for dermal absorption exposure pathways, the absence of dermal toxicity criteria necessitated the use of oral toxicity data. There is some uncertainty regarding the potential effects of carcinogenic PAHs since these compounds were not evaluated for the dermal exposure pathway. Because carcinogenic PAHs were selected as COPCs in surface and total soil, there is uncertainty regarding the potential underestimation of risks associated with dermal exposures to soil in this assessment. The effects of these uncertainties and others are discussed in detail in the HHRA for the three sites at the CCSA (Shaw, 2003).

7.2 Summary of Ecological Risk Assessment

7.2.1 Identification of Chemicals of Potential Concern

Chemicals were selected for evaluation in the ERAs if they: i) were presumed to be present because of past activities at the CCSA sites; and ii) posed potential risks to ecological receptors. COPCs were selected if their maximum concentrations exceeded the screening level concentrations for ecological receptors provided by USEPA Region III's Biological Technical Assistance Group (BTAG). Chemicals with maximum concentrations below the screening levels were eliminated from further consideration. All other chemicals were retained as COPCs, including those chemicals lacking screening levels. **Table 8**, p. 87 presents the chemicals of potential concern in soils at the G-Street Salvage Yard.

7.2.2 Exposure Assessment

Potential exposure pathways and assessment endpoints for ecological receptors were identified based on: i) the likely presence of ecological resources; ii) the nature and extent of chemical contamination; iii) the source/mechanism of chemical release; iv) the medium (or media) of chemical transport; v) the point of potential contact by potential receptor groups; and vi) the route of exposure at the contact point. Potentially complete exposure pathways and exposure groups were identified for evaluation in the ERA based on consideration of the available habitat, and the type, extent, magnitude, and location of potential chemical contamination.

The following potential receptors and exposures routes were identified for surface soil at the Salvage Yard Soil Area and BRDA:

- Terrestrial Plants – direct contact (root uptake)
- Soil Invertebrates – dermal contact and ingestion
- Vermivorous Mammals – direct contact and ingestion
- Vermivorous Birds – direct contact and ingestion
- Amphibians and Reptiles – direct contact and ingestion

Maximum concentrations were used to screen chemicals for their potential to adversely affect herbaceous plant communities and earthworms.

7.2.3 Ecological Effects Assessment

The majority of plant toxicity information available from scientific literature is for inorganic COPCs and has been based on the evaluation of potential adverse effects to agricultural crops from the presence of inorganic chemicals in surface soil. Very few toxicity values have been developed for organic chemicals, and the toxicity database is inadequate for the evaluation of potential adverse effects to terrestrial plants from the presence of organic compounds in surface soil.

Toxicity reference values (TRVs) reported by Efroymson et al. (1997) were used when available to assess the potential for chemicals to adversely affect terrestrial plants and earthworms. TRVs used for terrestrial wildlife were based on widely accepted sources such as Sample et al. (1996), the U.S. Army Center for Health Promotion and Preventive Medicine, and the Office of Solid Waste and Emergency Response to evaluate the potential for adverse effects to the receptors of concern. Avian TRVs were then derived applying total uncertainty factors from Sample et al. (1996) to daily doses reported in various references. **Table 9**, p. 92 presents chemicals of potential concern for the ERA.

7.2.4 Ecological Risk Characterization

The ERA concluded that inorganic compounds in the soils did not pose a risk to terrestrial plants or soil invertebrates, but could pose a minimal risk to vermivorous mammals and vermivorous birds. Pesticides had a low potential to adversely affect vermivorous birds by ingestion of prey. No specific COCs were identified for amphibians, but analyses indicated that site contaminants were unlikely to cause adverse effects. **Table 10**, p. 93 contains information on the ecological exposure pathways at the G-Street Salvage Yard.

7.3 Summary of Radiological Risk Assessment

Radiological risk was assessed at the Salvage Yard Soil Area and BRDA. Limited information on historical operations at the areas indicates that there was no use of radioisotopes. Media sampled for radiological constituents in the Salvage Yard included surface and subsurface soil.

There is substantial evidence that the on-site activity levels of the radionuclides at the two areas are background related based on statistical comparisons and geochemical evaluation. This is further substantiated by national and regional background data, a lack of evidence that radionuclide contamination occurred on-site from past operations, and the fact that all of the radionuclides identified as COPCs are naturally occurring. Because these naturally-occurring radionuclides are present at background levels, they are not COCs requiring remedial consideration.

7.4 UXO/CWM Hazard at the BRDA

Anticipated UXO/CWM that may be encountered in the BRDA are based on the items recovered during previous removal activities in this area. During an interim removal action in 1990 at the BRDA, scrap metal, WWII-era gas masks, underground storage tanks, UXO, chemical bomblets, munitions debris, drums with detectable traces of HD and VX, a glass vial containing a small amount of liquid contaminated with VX, and other miscellaneous items were recovered. Based on the items recovered during the interim removal action, the threat exists for additional UXO and chemical munitions to be present at the BRDA. Potential UXO items include 2.36-inch rockets, rifle grenades, projectile fuzes, white phosphorus igniters, and bursters. Potential CWM includes M125 and M134 chemical bomblets, and glass vials or containers with VX or HD.

7.5 Risk Summary

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from the actual or threatened releases of hazardous substances into the environment.

7.5.1 Human Health

The results of the HHRA cancer risk estimates indicate that future exposures to soil at the two areas are within or below the acceptable risk range for health protectiveness at Superfund sites (1×10^{-6} to 1×10^{-4}) for site workers, excavation workers, and trespassers. The estimated non-carcinogenic hazard index (HI) values for the Salvage Yard Soil Area were above 1 for all considered receptor scenarios, ranging from slightly above 1 to 96 for an excavation worker. The primary contaminants contributing to these elevated HI values are cadmium, chromium, antimony, and Aroclor 1254. For the BRDA, there was only one HI value slightly above 1 for an excavation worker (HI = 2.4). The primary contaminants contributing to this elevated HI are chromium, copper, and iron (Shaw, 2003).

In addition to the HHRA carcinogenic risk and HI estimates, lead in soil was also above the USEPA recommended human health industrial screening value (800 milligrams per kilogram [mg/kg]) at the Salvage Yard Soil Area (USEPA, 2006). UXO and CWM also pose a safety/health hazard at the BRDA (see Section 7.4).

For the hypothetical adult and child residents, the estimated carcinogenic risk from exposure to soil in the Salvage Yard Soil Area was above the acceptable risk range. Additionally, non-carcinogenic HIs were above 1 for both the Salvage Yard Soil Area and BRDA.

In addition to chemical risk evaluation, radiological risk was assessed at the Salvage Yard. Available information on historical operations indicates that there was no past use of radioisotopes at the site. Based on this historical background, sampling results compared to national and regional background data, and geochemical evaluation, it was concluded that the on-site activity levels of the radionuclides are background related.

7.5.2 Ecological

Terrestrial plants, soil invertebrates, vermivorous mammals, vermivorous birds, and amphibians and reptiles were considered in the ERA. Results of these evaluations indicate that lead, zinc, PCBs, and DDT may be present in concentrations that could have adverse effects on vermivorous mammals and birds at the two site areas.

The *Three Sites in Canal Creek ERA* (EA, 2004) suggested that DDTr concentrations in surface soil and prey items had potential to adversely effect vermivorous birds at the G-Street Salvage Yard, and that Aroclor 1260 and lead could adversely affect vermivorous mammals; however, the risk was considered minimal.

8 REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are goals that are developed for the protection of human health and the environment. These objectives can be achieved by reducing exposure (e.g., capping an area or limiting access) as well as reducing the level of contamination.

The Salvage Yard Soil Area and BRDA have been identified as potential secondary enhanced use leasing (EUL) development areas. Under the EUL process, the Army will seek help from the private sector to market and develop/redevelop certain areas or facilities for research and development, administrative/office, assembly and testing, warehousing, training, and other uses.

This ROD addresses the selection of remedial alternatives for the G-Street Salvage Yard site which is divided into the Salvage Yard Soil Area and BRDA. The selected remedial alternatives satisfy specific RAOs determined based on a review of available data and all Applicable or Relevant and Appropriate Requirements (ARARs).

The RAOs for the Salvage Yard Soil Area are:

- Protect future military/industrial workers from unacceptable risk associated with COCs in soil.
- Protect ecological communities from unacceptable effects associated with COCs in soil.
- Prevent migration of COCs to downgradient marsh and surface water bodies via surface water runoff.

The RAOs for the BRDA are:

- Protect future military/industrial workers from unacceptable risk associated with COCs in soil.
- Eliminate the safety hazard from UXO/CWM potentially present in the area to be excavated.
- Protect ecological communities from unacceptable effects associated with COCs in soil and waste material.
- Prevent migration of COCs to downgradient marsh and surface water bodies via surface water runoff.

Risk-based RGs for soil at the Salvage Yard Soil Area and the BRDA are presented in **Tables 11 and 12** (pp. 94 and 95), respectively. Remedial performance standards have been established for protection of ecological receptors and for LUCs to prevent residential and related exposures. These remedial performance standards are listed in the description of the selected remedies (Section 12).

These RGs were developed during the FS (Shaw, 2005) and are protective of human health and ecological receptors based on future industrial land use.

Groundwater contamination, which is not discussed in this ROD, will be addressed under a separate ROD.

The Selected Remedies for the two subject G-Street Salvage Yard areas will address risk by removing elevated levels of contaminants at both areas; removing fill material at the BRDA; and eliminating exposure to contaminated soil remaining below 2 feet bgs. The response actions selected in this ROD are necessary to protect the public health and the environment from actual or threatened releases of hazardous substances into the environment.

9 DESCRIPTION OF ALTERNATIVES

Remedial alternatives for the Salvage Yard Soil Area and BRDA are presented below.

"No Action," institutional controls, containment, and excavation alternatives were evaluated for both of the areas. The "No Action," institutional controls, containment, and excavation options would leave COCs on-site in concentrations above RGs.

The remedial alternatives analyzed in the FS Report are summarized below. Except for Alternative 1 (No Action), all of the remedial alternatives include a LUC component to prevent future military family housing, elementary and secondary schools, child care facilities, playgrounds, and non-military residential land use.

9.1 Salvage Yard Soil Area

9.1.1 Alternative 1: No Action

The NCP requires consideration of "No Action" as a baseline with which to compare other alternatives. Under this alternative, no active remedial measures will be taken to control risks to human or ecological receptors; treat or remove contaminated soil; or reduce the toxicity, mobility, or volume of contaminated media.

The evaluation of this alternative in the FS assumed that LUCs will not continue; however, the FS assumed that CERCLA reviews will be conducted every 5 years because the contamination remaining on-site will not allow for unlimited use and unrestricted exposure. The cost estimate assumes six Five-Year Reviews during a 30-year period.

Estimated Capital Cost:	*$0*
Estimated Annual O&M Cost:	*$3,000*
Estimated Present Worth O&M Cost:	*$46,000*
Estimated Total Present Worth Cost:	*$46,000*
Estimated Construction Timeframe:	*No construction*
Estimated Time To Achieve RAOs:	*Will not achieve RAOs*

9.1.2 Alternative 2: Institutional Controls

Under Alternative 2, exposure to the contaminated soil will be limited due to access and land use restrictions and long-term groundwater monitoring. This alternative also includes a public information program, provides a database of information about the site, and evaluates the changes in site conditions over time. This alternative assumes that CERCLA 121(c) reviews will be conducted every 5 years to assess the continued effectiveness of the remedy, and assumes that groundwater monitoring will be conducted to evaluate the potential migration of contaminants from soil into groundwater. The cost estimate assumes six Five-Year Reviews during a 30-year period.

Estimated Capital Cost:	*$84,000*
Estimated Annual O&M Cost:	*$21,000*
Estimated Present Worth O&M Cost:	*$328,000*
Estimated Total Present Worth Cost:	*$412,000*
Estimated Construction Timeframe:	*No construction*
Estimated Time To Achieve RAOs:	*12 months*

9.1.3 Alternative 3: Low-Permeability Cover

A low permeability cover, restricting water infiltration, will be constructed over contaminated soil exceeding industrial and ecological RGs to limit the potential migration of contaminants from the area, and to prevent worker and ecological receptor contact with the soils. Soil from several smaller areas of contamination at the Salvage Yard will be excavated and consolidated within the larger contaminated soil footprint. Prior to excavation, Explosive Ordnance Disposal (EOD) technicians will perform unexploded ordnance (UXO) removal within the excavation footprints. After the contaminated soil is consolidated into the area proposed for the low permeability cover, the cover will be constructed. The cover, from the bottom up, will consist of a foundation layer to provide support and appropriate slopes to the improvements, a clay barrier layer, graded stone to prevent animal intrusion, and at least 2 feet of clean soil with vegetation at the surface.

In addition to the low permeability cover, LUCs limiting site access to protect the integrity of the cover, and long-term monitoring (LTM) and maintenance ensuring long-term effectiveness of the cover will also be required. Long-term groundwater monitoring will also be necessary to evaluate the potential migration of contaminants from soil into groundwater.

Estimated Capital Cost:	*$903,000*
Estimated Annual O&M Cost:	*$18,000*
Estimated Present Worth O&M Cost:	*$278,000*
Estimated Total Present Worth Cost:	*$1,181,000*

Estimated Construction Timeframe: *12 months*

Estimated Time To Achieve RAOs: *24 months*

9.1.4 Alternative 4: RCRA Cap

A RCRA cap, restricting water infiltration, will be constructed over contaminated soil exceeding industrial and ecological RGs to limit the potential migration of contaminants from the area, and to prevent worker and ecological receptor contact with the soils. A RCRA cap is similar to the low permeability cover, but also includes a synthetic liner over 2 feet of compacted clay to ensure no water infiltrates through the cap. Similar to Alternative 3, soil from several smaller areas of contamination at the area will be excavated and consolidated within a larger contaminated soil footprint. Prior to excavation of contaminated soils, EOD technicians will perform a UXO clearance within the excavation footprints. A RCRA cap will be constructed over the contaminated soil consolidation area. The RCRA cap, from the bottom up, will consist of a foundation layer, a 2-foot-thick compacted clay barrier layer, a primary layer of high-density polyethylene (HDPE), graded stone to prevent animal intrusion, and at least 2 feet of clean soil with vegetation on top.

In addition to the RCRA cap, LUCs limiting site access to protect the integrity of the cap, LTM and maintenance ensuring long-term effectiveness of the cap will also be required. Long-term groundwater monitoring will also be necessary to evaluate the potential migration of contaminants from soil into groundwater.

Estimated Capital Cost: *$974,000*

Estimated Annual O&M Cost: *$18,000*

Estimated Present Worth O&M Cost: *$278,000*

Estimated Total Present Worth Cost: *$1,252,000*

Estimated Construction Timeframe: *12 months*

Estimated Time To Achieve RAOs: *24 months*

9.1.5 Alternative 5: Soil Excavation and Off-Site Disposal

This alternative involves excavation and off-site disposal of approximately 6,339 cubic yards (yd^3) of contaminated surface soil (0 to 2 feet bgs) exceeding industrial and ecological RGs. *Figure 4, p. 59* illustrates the approximate extent of surface soil contamination to be excavated. The actual extent of excavation will be based on confirmation sampling to ensure that all contaminated surface soil has been removed to below applicable RGs. Since soil remediation will only be conducted to a maximum depth of 2 feet bgs, LUCs prohibiting residential land use and soil disturbance at a greater depth will be implemented if contamination exceeding RGs is present below this depth.

Prior to excavation of contaminated surface soils, EOD technicians will perform a UXO clearance within the excavation footprints. The release of dusts and particulates during excavation activities will be controlled through dust control measures, such as sprinkling or wetting haul roads, sprinkling or wetting of excavation areas, removal of accumulated dirt/mud from traffic routes, covering excavated areas to prevent wind entrainment, and other measures. Water will not be used for dust suppression when it will result in, or create objectionable conditions such as ice, flooding, or pollution. Erosion and sediment controls will incorporate the collection of wastewater and/or protection of storm sewers.

ARARs will be met through detailed project planning and proper implementation of construction activities. Waste management will meet action-specific ARARs and RCRA requirements. Excavated materials will be shipped to an off-site landfill for disposal. Depending upon the waste characterization results, the contaminated materials will be transported to either a hazardous waste or a solid waste landfill. All excavations and disturbed areas will be backfilled to original grade with clean soil. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance. Topsoil along with seed and mulch will be placed over the clean soil layer to stabilize all disturbed areas.

Estimated Capital Cost:	*$2,448,000*
Estimated Annual O&M Cost:	*$6,000*
Estimated Present Worth O&M Cost:	*$156,000*
Estimated Total Present Worth Cost:	*$2,544,000*
Estimated Construction Timeframe:	*12 months*
Estimated Time To Achieve RAOs:	*24 months*

9.2 Burn Residue Disposal Area

9.2.1 Alternative 1: No Action

The NCP requires that a "no action" alternative be evaluated at every Superfund site to establish a baseline for comparison to other alternatives. Under this alternative, the Army will take no action in this area to prevent exposure to the soil contamination and buried waste material. This alternative provides no protection to human health or the environment.

Estimated Capital Cost:	*$0*
Estimated Annual O&M Cost:	*$3,000*
Estimated Present Worth O&M Cost:	*$46,000*
Estimated Total Present Worth Cost:	*$46,000*
Estimated Construction Timeframe:	*No construction*
Estimated Time To Achieve RAOs:	*Will not achieve RAOs*

9.2.2 Alternative 2: Improve and Extend Existing Cover

A temporary sand safety cover was installed in 1996 over the BRDA as an emergency measure to protect human health and the environment from potential contaminants and UXO/CWM. This alternative proposes enhancing and extending the existing cover to provide a permanent containment remedy. This includes cutting the trees that are currently growing on/through the existing cover, extending the cover to include those portions of the disposal area determined to be outside of the existing cover, extending the cover over contaminated surface soils, repairing compromised areas of the existing cover, and improving the cover to include an animal intrusion barrier.

The existing cover was constructed with a minimum of 2 feet of masonry sand, soil, and vegetative cover. The sand cover was constructed around the trees that were present in the area. Due to erosion and settling, the current height of the cover will be checked to ensure that a minimum of 2 feet of cover is present. The trees will then be cut flush with the existing cover. The holes surrounding the remaining stumps will be filled in with sand as will the holes caused by animal intrusion. Settling of the cover will be rechecked to ensure the cover is a minimum of 2 feet thick. The cover will be extended to cover all BRDA materials outside of the existing cover and contaminated surface soils exceeding industrial and ecological RGs. A barrier to animal intrusion will be added over the existing and extended cover to prevent animals from burrowing into the cover and compromising its integrity. Topsoil will be placed over the animal barrier to ensure growth of vegetation and secure the sand. The topsoil layer will be seeded and erosion control measures will be used to prevent loss of the installed materials.

In addition to the cover, LUCs limiting site access to protect the integrity of the cover, LTM, and maintenance ensuring long-term effectiveness of the cover will also be required. Long-term groundwater monitoring will also be necessary to evaluate the potential migration of contaminants from soil into groundwater.

The cover constructed as part of this alternative would not meet RCRA ARARs if the area is considered a landfill. At the time the Proposed Plan was issued for this site, the need for an ARARs waiver [40 CFR Section 300.430(f)(1)(ii)(C)] for this alternative was not identified and was not included in the Proposed Plan. A more detailed analysis of ARARs during the development of this ROD, however, indicates that a waiver would be necessary if this remedy were selected. In that case, the issuance of a new Proposed Plan would be necessary along with an associated additional public comment period. Although this alternative would typically be screened out of the ROD for non-compliance with the ARARs criteria, it has been retained in this ROD because it was one of the alternatives presented in the Proposed Plan for the site. The need for an ARARs waiver for this alternative was a consideration in selecting the Excavation and Off-Site Disposal Alternative (Alternative 3).

Estimated Capital Cost:	*$464,000*
Estimated Annual O&M Cost:	*$17,000*
Estimated Present Worth O&M Cost:	*$265,000*
Estimated Total Present Worth Cost:	*$729,000*
Estimated Construction Timeframe:	*9 months*
Estimated Time To Achieve RAOs:	*18 months*

9.2.3 Alternative 3: Excavation and Off-Site Disposal

This alternative involves excavation and off-site disposal of an estimated 2,800 yd^3 of BRDA burn residue material and 533 yd^3 of contaminated surface soils (0 to 2 feet bgs). *Figure 4, p. 59* illustrates the approximate extent of contaminated surface soil that will be excavated. The actual extent of excavation will be based on confirmation sampling to ensure that all contaminated surface soil has been removed to below applicable RGs (presented in **Table 12**, p. 95). Due to the potential presence of UXO/CWM in the BRDA, excavation and removal of materials will be conducted under the strict Army safety requirements of a UXO/CWM removal action. All intrusive operations into the BRDA burn residue material will be performed in a vapor containment structure (VCS) to contain a potential CWM release from a chemical agent bomblet. In addition to the waste material removal, the BRDA contaminated surface soil exceeding industrial and ecological RGs will be excavated and disposed off-site.

All excavation activities will be conducted by qualified EOD technicians due to the potential for encountering UXO/CWM. Excavation activities will first begin with the removal of the safety cover from the BRDA. After the cover has been removed, contaminated surface soil will be excavated and removed. Since surface soil remediation will be conducted only to a maximum depth of 2 feet bgs, LUCs prohibiting soil disturbance at a greater depth will be implemented if contamination is present at unacceptable risk levels. Prior to any excavation activities, EOD technicians will conduct a clearance of the area to be excavated. Excavation of the safety cover and contaminated soil will be conducted with low ground pressure earthmoving equipment.

Once the safety cover and contaminated surface soil have been excavated and removed, excavation of the burn residue material will commence. The excavation of the BRDA will be conducted within a VCS. Soil will be both hand and mechanically excavated, cleared of potential UXO/CWM, and containerized. The VCS will be outfitted with an air filtration system to maintain a negative air pressure and remove an agent vapor release if one were to occur. An extensive air monitoring program will be established to ensure worker and public safety. Real-time monitoring of meteorological conditions and audio/video monitoring of the excavation team activities will be performed. Excavation workers inside the VCS will wear Level A personal protective equipment during intrusive operations to protect against potential exposure to CWM.

Sloping or benching will be required for excavation depths below 4 feet in accordance with OSHA requirements. ARARs will be met through detailed project planning and proper implementation of construction activities. Waste management will meet action-specific ARARs and RCRA requirements. All contaminated soil/material removed from the BRDA and certified free of UXO/CWM will be turned over to the on-post hazardous waste contractor for transport to a treatment facility and disposal. Any UXO/CWM materials encountered will be turned over to the U.S. Army Technical Escort for disposal.

The release of dusts and particulates during excavation activities will be controlled through dust control measures, such as sprinkling or wetting haul roads, sprinkling or wetting of excavation areas, removal of accumulated dirt/mud from traffic routes, covering excavated areas to prevent wind entrainment, and other measures. Water will not be used for dust suppression when it will result in, or create objectionable conditions such as ice, flooding, or pollution. Erosion and sediment controls will incorporate the collection of wastewater and/or protection of storm sewers.

After BRDA excavation and confirmation sampling is complete, the excavation and disturbed areas will be backfilled to original grade with clean soil. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance. Topsoil along with seed and mulch will be placed over the clean soil layer to stabilize all disturbed areas.

Estimated Capital Cost:	*$5,223,000*
Estimated Annual O&M Cost:	*$6,000*
Estimated Present Worth O&M Cost:	*$96,000*
Estimated Total Present Worth Cost:	*$5,319,000*
Estimated Construction Timeframe:	*15 months*
Estimated Time To Achieve RAOs:	*30 months*

10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The following is a comparative analysis of the alternatives being considered for remediating the two subject G-Street Salvage Yard areas. The alternatives are evaluated against the NCP threshold and primary balancing criteria. The analysis identifies trade-offs between alternatives; **Tables 13 and 14** (pp. 96 and 99) present these analyses.

10.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.

Salvage Yard Soil Area – Alternative 1 does not provide protection of human health and the environment because the contaminated soils are allowed to remain uncovered at the site. Since Alternative 1 is not protective of human health or the environment, it is eliminated from further consideration under the remaining eight criteria. Even though Alternative 2 would allow contaminated soils to remain uncovered at the site, institutional controls would provide some protection to human health. Even though Alternatives 3 and 4 allow contaminated soils to remain at the site, contaminant covers and institutional controls would provide some protection to human health. Alternative 5 is the most protective of human health and the environment because soils within 2 feet of the ground surface with contaminant concentrations exceeding cleanup standards would be removed, and institutional controls would be implemented to prevent residential land use and soil disturbance below a depth of 2 feet bgs.

BRDA – Alternative 1 is not protective of human health and the environment because nothing is proposed to cover or remove the contaminated soils. Since Alternative 1 is not protective of human health or the environment, it is eliminated from further consideration under the remaining eight criteria. Even though Alternative 2 would allow contaminated soils to remain at the site, a contaminant cover and institutional controls would provide some protection to human health. Alternative 3 is protective of human health and the environment because soils within 2 feet of the ground surface with contaminant concentrations exceeding cleanup standards would be removed outside of the burial area, and all contaminated soil would be removed from the burial area itself.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARAR)

CERCLA, as amended, requires that remedial actions at NPL sites comply with other laws and regulations that may be applicable to the site or that address situations sufficiently similar to those at the site to be considered relevant and appropriate. These other laws and regulations, termed ARARs, may be:

- Chemical-specific (requirements related to site contaminants);
- Action-specific (requirements related to the specific RA being considered); or
- Location-specific (requirements related to site location).

Applicable ARARs are presented in **Table 15** (p. 101). The complete list of potential ARARs for the two subject areas at the G-Street Salvage Yard can be found in the FS (Shaw, 2005).

Chemical-Specific ARARs

There are no Federal or State chemical-specific ARARs for the COCs in soil at the two subject areas. However, other chemical-specific guidance is available. This information is referred to in CERCLA as "To Be Considered" (TBC) guidance. TBC guidance includes non-promulgated advisories or guidance issued by Federal or State governments, or draft regulations that have not been promulgated, that are not legally binding, and do not have the status of ARARs; however, once the determination is made that the guidance provides a useful standard for performance of the remedial action, that standard is included in the ROD as a requirement that must be complied with.

TBCs were considered along with ARARs and would be used in determining the necessary level of cleanup for protection of human health and the environment. The risk-based RGs developed as part of the FS (see Section 8, Remedial Action Objectives and **Table 11**, p. 94, and **Table 12**, p. 95), are derived from TBC guidance. TBCs were considered appropriate requirements and are listed as applicable guidance in **Table 16**, p.105.

Salvage Yard Soil Area – Alternative 2 does not actively address soils exceeding RGs, although human contact with soil exceeding RGs is prevented. Alternatives 3 through 5 cover or remove soils exceeding RGs.

BRDA – Alternatives 2 and 3 cover or remove soils exceeding RGs.

Location-Specific ARARs

Federal and State location-specific ARARs (such as floodplain and endangered species protection requirements, see **Table 15**, p. 101 for a complete list of location-specific ARARs and **Table 16**, p. 105 for applicable guidance) are associated with proper RA planning and siting activities.

Salvage Yard Soil Area – Alternatives 2 through 5 would meet the location-specific ARARs.

BRDA – Alternatives 2 and 3 would meet the location-specific ARARs.

Action-Specific ARARs

Federal and State action-specific ARARs (such as erosion control and waste disposal requirements, see **Table 15**, p. 101 for a complete list of action-specific ARARs and **Table 16,** p. **105** for applicable guidance) are associated with construction and waste management activities. In addition, for all alternatives, RCRA hazardous waste storage and handling ARARs apply.

Salvage Yard Soil Area – Action-specific ARARs do not apply to Alternative 2 since no active remediation would be implemented. Alternative 3 and 4 would meet the action-specific ARARs because erosion controls and waste management activities are provided in these alternatives. Alternative 5 would meet the action-specific ARARs including erosion controls and waste management activities.

BRDA – Alternative 2 would not meet the action-specific ARARs since materials within the BRDA are potentially hazardous and the proposed cover would not meet RCRA standards. If Alternative 2 were selected, a waiver for these ARARs might be required if the area is considered a landfill. Alternative 3 would meet the action-specific ARARs because contaminated soil exceeding RGs would be removed.

10.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up levels have been met. This criterion includes the consideration of residual risk that would remain on-site following remediation, and the adequacy and reliability of controls.

Salvage Yard Soil Area – Alternative 2 would be partially effective since institutional controls would only protect human health and not the environment. Alternatives 3 and 4 would be effective, but not permanent. Alternative 5 would be effective and permanent. Alternatives 3 and 4 would not allow for future site development without removal of the cover/cap, whereas Alternative 5 would allow for future development within the restrictions established by LUCs.

BRDA – Alternative 2 would be effective, but not permanent. Alternative 3 would be both effective and permanent. Alternative 2 would not allow for future site development without removal of the cover, whereas Alternative 3 would allow for future development within the restrictions established by LUCs, if necessary.

10.4 Reduction of Mobility, Toxicity, or Volume Through Treatment

This criterion evaluates how effectively treatment is being employed in the remedial alternative to reduce the toxicity, mobility, and volume of contaminants at the site.

Salvage Yard Soil Area – Treatment is not a component of Alternatives 2 through 5; therefore, these alternatives would not result in a reduction of toxicity, mobility, or volume via treatment.

BRDA – Treatment is not a component of Alternatives 2 and 3; therefore, these alternatives would not result in a reduction of toxicity, mobility, or volume through treatment.

10.5 Short-Term Effectiveness

Short-term effectiveness takes into account protection of remedial workers, members of the community, and the environment during implementation of the remedial action and the time required to achieve RAOs.

Salvage Yard Soil Area – Alternatives 2 through 5 would be implemented safely and would be effective immediately upon completion. Alternative 2 would be completed in the shortest timeframe because there is no construction period, and it is estimated that LUCs could be implemented in 12 months. Alternatives 3 through 5 would be completed in 24 months (12 months construction and 12 months to implement LUCs).

BRDA – Alternative 2 would be implemented safely and would be effective immediately upon completion. Alternative 3 would meet the criterion since safety measures would be implemented to address UXO/CWM hazards that potentially could be encountered and would be effective immediately upon completion. Alternative 2 would be completed in the 18 months (9 months construction and 9 months to implement LUCs). Alternative 3 would be completed in 30 months (15 months construction and 15 months to implement LUCs).

10.6 Implementability

Three factors are considered for implementability: whether the alternative is practical in a technical sense; whether it is practical in an administrative sense; and whether the required services and materials are available.

Salvage Yard Soil Area – Alternative 2 could easily be implemented, while Alternatives 3 through 5 would be more challenging, but still implementable. The relative complexity to implement the alternatives, ranked from easiest to implement to most challenging to implement, would be: (1) Alternative 2; (2) Alternative 3, (3) Alternative 5, and (4) Alternative 4.

BRDA – Alternative 3 would be more challenging to implement than Alternative 2 due to the additional engineering controls required to achieve remedy completion.

10.7 Cost

The costs considered in this analysis include total capital cost, annual O&M costs, and present worth. The net present worth cost is the amount of money in current dollars necessary to cover the total cost of remediation [i.e., for sites with long-term activities, the present worth assumes a 5 percent interest rate over a 30-year period].

Cost comparisons for all of the alternatives for the Salvage Yard Soil Area and BRDA are presented below.

Salvage Yard Soil Area Cost Comparison

	Alternative 1 No Action	**Alternative 2 Institutional Controls**	**Alternative 3 Low-Permeability Cover**	**Alternative 4 RCRA Cap**	**Alternative 5 Soil Excavation and Off -Site Disposal**
Capital Cost	$0	$84,000	$903,000	$974,000	$2,448,000
Annual O&M Cost	$3,000	$21,000	$18,000	$18,000	$6,000
Present Worth Cost	$46,000	$412,000	$1,181,000	$1,252,000	$2,544,000

Burn Residue Disposal Area Cost Comparison

	Alternative 1 No Action	**Alternative 2 Improve Existing Cover**	**Alternative 3 Soil Excavation and Off-Site Disposal**
Capital Cost	$0	$464,000	$5,223,000
Annual O&M Cost	$3,000	$17,000	$6,000
Present Worth Cost	$46,000	$729,000	$5,319,000

Salvage Yard Soil Area – Alternative 2 has the lowest total present worth cost and Alternative 5 has the highest. Although Alternative 5 has the highest cost, it is the only alternative that could allow for industrial development of the site consistent with future use plans. The ranking of the alternatives by present worth costs, from least expensive to most expensive, is: (1) Alternative 2; (2) Alternative 3; (3) Alternative 4; and (4) Alternative 5.

BRDA – Alternative 2 has the lowest total present worth cost and Alternative 3 has the highest. Although Alternative 3 has the highest cost, it is the only alternative that would allow for industrial development of the site consistent with future use plans.

10.8 State Acceptance

State representatives have reviewed the remedial alternatives and provided preliminary comments that were addressed in the FS Report and Proposed Plan. Based on a thorough review of the remedial alternatives and public comments, MDE concurs with the Selected Remedy.

10.9 Community Acceptance

A full transcript of the Public Meeting, held on 25 June 2007, is available on CD-ROM in the Administrative Record. The community appears to be in support of the Selected Remedy. Responses to written comments received from the community are presented in Part 3 of this document.

11 PRINCIPAL THREAT WASTES

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally can not be reliably contained or would present a significant risk to human health or the environment should an exposure occur (OSWER 9380.3-06FS). UXO and CWM are principal threats for the BRDA.

Anticipated UXO/CWM that may be encountered in the BRDA are based on the items recovered during previous removal activities in this area. During an interim removal action in 1990 at the BRDA, scrap metal, WWII-era gas masks, underground storage tanks, UXO, chemical bomblets, munitions debris, drums with detectable traces of HD and VX, a glass vial containing a small amount of liquid contaminated with VX, and other miscellaneous items were recovered. Based on the items recovered during the interim removal action, the threat exists for additional UXO and chemical munitions to be present at the BRDA. Potential UXO items include 2.36-inch rockets, rifle grenades, projectile fuzes, white phosphorus igniters, and bursters. Potential CWM includes M125 and M134 chemical bomblets (which could contain GB), and glass vials or containers with VX or HD.

12 SELECTED REMEDIES

12.1 Summary of the Rationale for the Selected Remedies

The Selected Remedy for the Salvage Yard Soil Area is Soil Excavation and Off-Site Disposal. The Selected Remedy for the BRDA is Excavation and Off-Site Disposal. Both Selected Remedies include Land Use Controls. The rationale for the selected remedies for the Salvage Yard Soil Area and BRDA is provided below.

12.1.1 Salvage Yard Soil Area

This Selected Remedy is protective of human health and the environment by removing surface soil contaminated above RGs protective of commercial/industrial use and by enforcing LUCs that prohibit residential use, including housing, elementary and secondary schools, child care facilities, and playgrounds; and by preventing migration of contaminants. This alternative satisfies the criteria of protection of human health and the environment and compliance with ARARs, is easy to implement, and provides short- and long-term effectiveness and permanence. This alternative fulfills more of the evaluation criteria than any of the other alternatives considered for the site. Although this alternative has the highest cost, it is the only alternative that allows for the industrial development of the Salvage Yard Soil Area consistent with future use plans. Additionally, since contamination is being left on-site above residential use action levels, which does not allow for unrestricted site use and exposure, CERCLA Five-Year Reviews will be necessary.

The cost summary for the Salvage Yard Soil Area Selected Remedy is presented below.

Salvage Yard Soil Area

Estimated Soil Volume	6,339 yd^3
Estimated Capital Cost	$2,448,000
Estimated Present Worth Operation and Maintenance (O&M) Cost	$156,000
Estimated Total Present Worth	$2,544,000
Estimated Time To Achieve Remedial Action Objectives (RAOs)	24 months

12.1.2 Burn Residue Disposal Area

This Selected Remedy is protective of human health and the environment by removing surface soil contaminated above RGs protective of commercial/industrial uses and by enforcing LUCs that prohibit residential use, including housing, elementary and secondary schools, child care facilities, and playgrounds; and by preventing migration of contaminants. This alternative satisfies the criteria of protection of human health and the environment and compliance with ARARs, and provides long-term effectiveness and permanence. Although it may be challenging to implement, this alternative eliminates the hazards associated with buried residue waste and contaminated soils for the anticipated future industrial use. It also meets the short-term effectiveness criterion if care is taken to anticipate the presence of UXO/CWM during implementation. Although this alternative has the highest cost, it is the only alternative that allows for the industrial development of the BRDA consistent with future use plans. Additionally, since contamination is being left on-site above residential use action levels, which does not allow for unrestricted site use and exposure, CERCLA Five-Year Reviews will be necessary.

The cost summary for the BRDA Selected Remedy is presented below.

BRDA

Estimated Soil Volume	533 yd^3
Estimated Burn Residue Volume	2,800 yd^3
Estimated Capital Cost	$5,223,000
Estimated Present Worth O&M Cost	$96,000
Estimated Total Present Worth	$5,319,000
Estimated Time To Achieve RAOs	30 months

12.2 Detailed Description of the Selected Remedies for Salvage Yard Soil Area and BRDA

The Selected Remedy at the Salvage Yard Soil Area is Alternative 5 – Soil Excavation and Off-Site Disposal. The Selected Remedy at the BRDA is Alternative 3 – Excavation and Off-Site Disposal.

The estimated total costs are provided below:

- Salvage Yard Soil Area $2,544,000
- BRDA $5,319,000

Total $7,863,000

12.2.1 Soil Excavation and Off-Site Disposal Remedy for the Salvage Yard Soil Area

- **Remedial Design/Remedial Action Work Plan/Remedial Action Completion Report:** The remedial design (RD) is a series of engineering reports, documents, specifications, and drawings that detail the steps to be taken during the remedial action (RA) to meet the goals established in this Record of Decision (ROD). The RD development phase includes all activities relating to the review and approval of all design efforts, including preliminary through final design phase submittals, as appropriate. The Remedial Action Work Plan (RAWP) details how the remedy will be implemented. The contractor will prepare the site-specific Remedial Design/Remedial Action Work Plan that will meet the USEPA remedial design requirements and will detail how the remedy will be implemented prior to initiation of excavation activities. RD/RAWP submittals will include components for health and safety, quality assurance/control, work tasks, land use control, etc.). The RD/RAWP submittals will be reviewed and approved by the Army and USEPA prior to remedial activities.

- After the remedial action has been completed, a Remedial Action Completion Report (RACR) will be prepared in accordance with the USEPA Closeout Guidance. The RACR demonstrates that the remedy has been completed and all remedial objectives have been met. The RACR will include site drawings, sample data, copies of all manifests, and a detailed narrative of the remedial action. The Draft RACR will be submitted to the Army, USEPA, and other regulatory agencies for review and comment. Comments will be incorporated into the Final RACR. The Final RACR will be submitted to USEPA.

- **Excavation Area Delineation:** The areas to be excavated will be established prior to mobilization of the excavation personnel. In addition to the RI sampling results, delineation samples will be collected and analyzed to identify the limits of contaminated soil excavation. It is estimated that a total of 40 delineation samples will be collected and analyzed for Target Analyte List (TAL) metals, PAHs, pesticides, and PCBs. Preliminary boundary limits for excavation of contaminated soils, indicated by the extent of contamination in *Figure 4, p. 59*, have been developed based on RI sampling results. Delineation samples will be finalized in the Remedial Design.

- **Site Set-up:** Work zone set-up for the excavation of contaminated surface soils at the Salvage Yard Soil Area will consist of setting up a project office trailer, equipment/materials staging areas, and decontamination station. Prior to the setup of these on-site facilities, a munitions and explosives of concern (MEC) surface sweep will be performed in work/support areas. Water will be trucked to the site and stored for decontamination. The remediation will not have any significant electrical needs beyond temporary generator use.

- Trees present in the excavation area will be removed prior to excavation. Clearing and grubbing will be performed using conventional equipment. For cost estimating purposes, it was assumed that trees will be removed using a bulldozer, picked up using an excavator with a grappler, and trucked to a designated area where they will be mulched using a grinder.

- **Excavation:** For cost estimating purposes, it was assumed that one D6 bulldozer will be used to excavate the area. Soil will be pushed into a pile and then loaded into dump trucks using a trackhoe and then transported to a permitted disposal facility. It is assumed that soil excavation will proceed at the rate of 200 tons per day, assuming that the disposal facility would receive wastes at this rate. Based on this rate, the estimated length of time for the excavation is nine weeks. A water truck will be required on-site part-time during excavation activities for dust suppression purposes. Air monitoring for dust generation using a MiniRAM will also be performed. The decontamination liquids generated from equipment cleaning will be stored in a 1,000-gallon storage tank for eventual disposal. Prior to excavation of contaminated soil, EOD technicians will be employed to perform construction support within the excavation footprints. All potentially contaminated soil will be handled on-site as hazardous waste until sampling indicates otherwise. Potentially contaminated soils will be stored in bermed areas on an impermeable membrane (e.g., polyethylene sheeting) to prevent run-on and subsurface contamination, or will be stored in roll-off containers. Soil piles and roll-off containers will be covered with impermeable covers, inspected, and maintained until final disposition.

- Confirmation sampling will be conducted following excavation, and excavation will continue until RGs (**Table 11,** p. 94) have been met or until a depth of 2 feet has been attained. It is estimated that approximately 35 confirmation samples [1 per 2,500 square feet (ft^2)] will be collected after completion of the excavation to ensure all contaminated soil has been removed. Confirmation samples will be analyzed at an off-site laboratory for TAL metals, PAH, pesticides, and PCBs.

- **Waste Characterization:** Waste characterization samples will be collected to determine if the contaminated soil will be disposed as a hazardous or non-hazardous waste. For FS cost estimating purposes, it was assumed that the waste soil will be sampled for full Toxicity Characteristic Leachate Procedure (TCLP), TAL metals, and RCRA characteristics at a rate of one composite sample per 500 tons, for a total of 17 samples.

- **Description of Wastes:** For cost estimating purposes, it was assumed that excavation activities will generate the following waste streams:

Waste Type	Estimated Quantity
Soil: RCRA Non-Hazardous Waste	8,241 tons
Decontamination Water – Non-Hazardous	1,000 gallons

- **Waste Transportation and Disposal:** The non-hazardous contaminated soil will be transported and disposed off-site at a licensed Subtitle D landfill. It was assumed that the decontamination water will also be non-hazardous, so it will be disposed into the APG-EA Sanitary Sewer System. Estimated costs for disposal of wastes are:

Waste Type	Disposal Method	Cost
Soil: RCRA Non-Hazardous Waste	RCRA Subtitle D Landfill	$160/ton
Decontamination Water – Non-Hazardous	APG-EA Sanitary Sewer System	No Cost

- **Site Restoration:** Clean soil fill will be obtained and used to backfill excavations to match the surrounding grade. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance. The area will be hydroseeded to reestablish vegetation for erosion control. Erosion mats or temporary barriers will be used as necessary to prevent erosion.

- **Access and Land Use Restrictions:** There are some institutional controls such as access and land use restrictions currently in place at the site. In addition to these existing controls, residential development/use of the site (including housing, elementary and secondary schools, child care facilities, and playgrounds) will be prohibited. This use restriction will be input into the APG geographic information system (GIS), which is utilized in the development of the APG Real Property Master Plan. In addition, in the unlikely event that the Army sells this property, the site restrictions must be incorporated into any real property documents necessary for transferring ownership from the Army. Such documents will also include a discussion of the NPL status, as well as a description of contamination at the site. In addition, DSHE will certify to the USEPA on an annual basis that there have been no violations of these prohibitions. Corrective action will be implemented by the Army if a violation were to occur. Since soil remediation will only be conducted to a maximum depth of 2 feet bgs, LUCs prohibiting residential land use and soil disturbance at a greater depth will be implemented if contamination exceeding RGs is present below this depth.

The Army shall be responsible for implementation, maintenance, periodic reporting, and enforcement of LUCs in accordance with the RD. As part of the Army's inspection and reporting responsibilities, periodic reviews will be undertaken and review reports will be submitted at a frequency determined by site-specific conditions. Although the Army may transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall remain ultimately responsible for remedy integrity and shall: i) perform CERCLA 121(c) Five-Year Reviews; ii) notify the appropriate regulators and/or local government representatives of any known LUC deficiencies or violations; iii) provide access to the property to conduct any necessary response; iv) retain the ability to change, modify, or terminate LUCs and any related deed or lease provisions; and v) ensure that the LUC objective is met to maintain remedy protectiveness.

The LUCs will be implemented through the APG Master Planning system with geographic information support.

As a condition of property transfer or lease, the Army may require the transferee or lessee in cooperation with other stakeholders to assume responsibility for various implementation actions. Third party LUC responsibility will be incorporated into pertinent contractual, property, and remedial documentation, such as a purchase agreement, deed, and lease. To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users. If the Army intends to transfer ownership of any site, the Army may, if Federal and/or State law allows, upon transfer of fee title, grant the State an environmental covenant or easement that would allow the State to enforce LUC terms and conditions against the transferee(s), as well as subsequent property owner(s) or user(s) or their contractors, tenants, lessees, or other parties. This covenant will be incorporated by reference in the transfer deed and will run with the land in accordance with State realty law. This state enforcement right would supplement, not replace, the Army's right and responsibility to enforce the LUCs.

- **Public Education Programs:** APG has a very active public education program already in place. The community plays an important role in the selection and implementation of remedial actions at APG. Educational programs will be developed to inform workers and local residents of the potential hazards because contamination will be left in place that does not allow for unrestricted use of the site. This will be achieved through public meetings, RAB meetings, presentations at local schools, press releases, and posted signs.

- **CERCLA 121(c) Five-Year Reviews:** Five-year reviews will be conducted to assess the long-term effectiveness of the LUCs until COCs in the soil/sediment are detected at levels that allow for unlimited use and unrestricted exposure.

12.2.2 Excavation and Off-Site Disposal Remedy for the BRDA

- **Remedial Design/Remedial Action Work Plan/Remedial Action Completion Report:** The contractor will prepare the site-specific RD/RAWP that will meet the USEPA remedial design requirements and will detail how the remedy will be implemented prior to initiation of excavation activities. RD/RAWP submittals will include components for health and safety, quality assurance/control, work tasks, land use control, etc. The RD/RAWP submittals will be reviewed and approved by the Army and USEPA prior to remedial activities. In addition to these remedial design documents and due to the potential presence of CWM and UXO in the BRDA material, a Chemical Safety Submittal addressing the MEC and CWM hazards will be required and will be submitted to the Defense Department Explosives Safety Board. The Chemical Safety Submittal is reviewed and approved through DoD and is not reviewed by USEPA, although components of the Chemical Safety Submittal will be incorporated into the remedial design documents that are submitted to USEPA for review and approval.

- After the remedial action has been completed, a RACR will be prepared in accordance with the USEPA Closeout Guidance. The RACR will include site drawings, sample data, copies of all manifests, and a detailed narrative of the remedial action. The Draft RACR will be submitted to the Army, USEPA, and other regulatory agencies for review and comment. Comments will be incorporated into the Final RACR. The Final RACR will be submitted to USEPA.

- **Contamination Delineation:** The BRDA surface soil area (outside of the BRDA burial area itself) to be excavated will be established prior to mobilization of the excavation personnel. In addition to RI sampling results, delineation samples will be collected to identify the limits of excavation. It is estimated that a total of 15 delineation samples will be collected and analyzed for TAL metals and pesticides. Preliminary boundary limits for excavation of contaminated surface soils, indicated by the extent of contamination in *Figure 4, p. 59*, have been developed based on RI sampling results. Delineation samples will be finalized in the Remedial Design.

- **Site Set-up:** Initial site set-up activities for the excavation of the BRDA material and contaminated surface soils will include establishing site access control at Salvage Yard; conducting MEC surface sweeps followed by clearing brush and trees in work and support areas; and the setup of the Command Center and personnel decontamination area. Prior to excavation activities, appropriate soil erosion and sediment control measures will be installed to prevent soil transport off-site.

- **Safety Cover and Surface Soil Excavation:** The existing safety cover over the BRDA will be initially removed, screened for potential MEC, and then staged on-site for use as backfill once the excavation is complete. Excavation will be performed with low ground pressure earthmoving equipment. This work will be performed by EOD technicians in Level D protection. Prior to excavation of the cover and contaminated surface soil, EOD technicians will be employed to perform MEC removal within the excavation footprint. All potentially contaminated soil will be handled on-site as hazardous waste until sampling indicates otherwise. Potentially contaminated soils will be stored in bermed areas on an impermeable membrane (e.g., polyethylene sheeting) to prevent run-on and subsurface contamination, or will be stored in roll-off containers. Soil piles and roll-off containers will be covered with impermeable covers, inspected, and maintained until final disposition. The safety cover material, surface soils, and BRDA materials will each be staged and characterized separately.

- **VCS Chemical Agent Filtration and Air Monitoring Systems:** Following the excavation of the cover and surface soil, the VCS and chemical agent filtration system, as well as air monitoring system, will be set up on-site and tested. The VCS structure will be erected over the entire BRDA material footprint with a buffer to provide coverage for the entire pit excavation plus any necessary benching/sloping of the excavation. The VCS and its chemical agent filtration system will be tested to ensure the integrity of the structure to contain an agent vapor release and the filtration system to remove the vapor. The VCS will be maintained under a negative pressure, and will be outfitted with a video monitoring system so that activities inside the structure would be monitored remotely from the Command Center. Real-time Miniature Chemical Agent Monitor (MINICAMS®) air monitoring with Depot Area Air Monitoring System (DAAMS) confirmation sampling will be conducted during intrusive operations inside and outside of the VCS. Edgewood Chemical Biological Center (ECBC) will be tasked with this monitoring.

- **Safety Zone Set-up:** The VCS, and attached personnel decontamination area and a surrounding fragmentation safety zone, will be considered the Exclusion Zone during the disposal pit excavation. The VCS will be maintained under negative pressure. Excavation workers inside the VCS will wear Level A personal protective equipment during intrusive operations to protect against potential exposure to CWM. Excavation equipment and tools, until satisfactorily decontaminated, will remain in the VCS. A Contamination Reduction Zone will be set up outside the personnel decontamination area for workers to re-dress into clean Level D PPE. Access to the VCS will be restricted to critical personnel (EOD Technicians, ECBC monitoring personnel, etc.) during excavation activities.

  As documented in the Final FS, Appendix A, U.S. Army Corps of Engineers (USACE) Preliminary G-Street Removal Action Hazard Evaluation (September 2002), the maximum credible event (MCE) for a BRDA material removal action is one M134 bomblet containing 1.1 pounds of the nerve agent GB. Modeling of the occurrence of the MCE with the Department of the Army accepted plume modeling program, D2PC, results in the following prospective downwind hazard distances under winter conditions:

  - 1% lethality distance – 0.19 mile.
  - No deaths distance – 0.26 mile.
  - No significant effects distance – 1.08 miles.

  These distances reflect the maximum hazard area and worst-case scenario from an open-air detonation under winter conditions. The VCS will be placed over the excavation area to control a potential CWM release. The no significant effects exclusion zone will be applied only if the VCS or air filtration system fails during an ongoing operation. If this were to occur, evacuation or shelter-in-place will be required of all unprotected personnel up to the no significant effects limits.

In addition to the evaluation of the MCE, the most probable munition will be used to calculate a minimum separation distance (MSD) or public withdrawal distance. The MSD is a minimum separation distance to ensure that non-essential personnel are kept out of the exclusion zone. According to the USACE hazard evaluation, the most probable munition is also considered to be the M134 bomblet with 0.18 pound of explosives. Engineering controls will be utilized as feasible and necessary to minimize the MSD during intrusive operations.

- **BRDA Material Excavation:** Upon completing the set-up and testing of the VCS over the BRDA, the excavation of the material will commence. All excavation work will be conducted by EOD technicians inside the VCS in Level A PPE. Assuming that the pit excavation will be deeper than 4 feet bgs, shoring and stabilizing the excavation walls, or sloping/benching, will be necessary.

  In addition to mitigating the potential CWM hazard associated with the BRDA excavation, engineering controls such as sand bags and/or metal plate barricades will be used to mitigate any explosive hazards posed to the general public.

  The BRDA material excavation will be conducted by EOD technicians by hand due to the unknown hazards in the pit and the potential for encountering MEC/CWM. As soil is excavated and cleared of MEC/CWM, it will be vacuumed from the excavation. For the purposes of estimating the remedial cost, it was assumed that three teams of four EOD technicians will rotate every hour (1 team digging, 1 team emergency responders, and 1 team on break). Also, it is assumed that an average hand dig excavation rate of contaminated pit materials of 30 yd^3/day will be achieved in the field. At this rate, it is estimated that the total excavation time to completely excavate the 2,800 yd^3 of pit materials is 19 weeks (or 4.5 months).

  Upon identification of munitions or suspect CWM, the EOD technicians will evacuate the site and dial "911" signaling appropriate Technical Escort Unit, DSHE safety, and fire department personnel to respond. Upon identification, stable munitions items will be packaged for transport by the Technical Escort Unit. Items deemed unstable, or unsafe for transport, will most likely be detonated on-site by Technical Escort Unit. Excavation will resume after the site has been cleared by the DSHE Safety Office.

- **Confirmation Sampling:** Confirmation sampling of the excavation limits will be conducted to document that the remaining BRDA soil meets established cleanup levels. Excavation will continue until RGs (**Table 12,** p. 95) have been met. It is estimated that approximately 30 confirmation samples will be collected from the final pit excavation limits and sent to an off-site laboratory for analysis for TAL metals, Target Compound List (TCL) VOCs and semivolatile organic compounds (SVOCs), pesticides/PCBs, explosives, and CWM degradation products.

- **Waste Characterization:** Characterization of debris and soil removed from the BRDA will be used to determine if it will be disposed as a hazardous or non-hazardous waste. Analysis for full TCLP, TAL metals, and RCRA characteristics was assumed for composite samples collected from the excavated soil. It is assumed that one composite sample will be completed per 500 tons, for a total of 16 samples.

- **Description of Wastes:** Excavation activities at the BRDA are expected to generate contaminated soil, mixed debris waste, potential construction debris, and potential MEC/CWM. For FS cost estimating purposes, it was assumed the following two waste streams will be generated:

Waste Type	Estimated Quantity
Soil: RCRA Non-Hazardous Waste	693 tons
BRDA Materials: Hazardous Waste	3,640 tons
Decontamination Water – Non-Hazardous	6,500 gallons

- **Waste Transportation and Disposal:** For cost estimating purposes, it was assumed that all of the materials in the BRDA are hazardous and the surface soils are non-hazardous. In addition, it was assumed that the decontamination water will be non-hazardous, so it will be disposed in the APG-EA Sanitary Sewer System. Cost for various disposal options are:

Waste Type	Disposal Method	Cost
Soil: RCRA Non-Hazardous Waste	RCRA Subtitle D Landfill	$160/ton
BRDA Materials: Hazardous Waste	Subtitle C Landfill	$320/ton
Decontamination Water – Non-Hazardous	APG-EA Sanitary Sewer System	No Cost

- **Site Restoration:** Clean soil fill will be used to backfill the BRDA excavations to match the surrounding grade. The sample results from proposed backfill material will be provided to EPA and MDE for acceptance. The area will be hydroseeded to reestablish vegetation for erosion control. Erosion mats or temporary barriers will be used as necessary to prevent erosion.

- **Access and Land Use Restrictions:** Since this alternative does not remediate soils to levels protective of unrestricted future use, prohibition of residential development/use of the site (including housing, elementary and secondary schools, child care facilities, and playgrounds) will be a land use control for the site. This land use restriction will need to be input into the APG GIS, which is utilized in the development of the APG Real Property Master Plan. In addition, in the unlikely event that the Army sells this property, this land use restriction will need to be incorporated into any real property documents necessary for transferring ownership from the Army. Such documents will also include a discussion of the NPL status, as well as a description of contamination at the site. In addition, DSHE will certify to USEPA on an annual basis that there have been no violations of this prohibition. Corrective action will be implemented by the Army if a violation were to occur. Since surface soil remediation will only be conducted to a maximum depth of 2 feet bgs, LUCs prohibiting residential land use and soil disturbance at a greater depth will be implemented if contamination exceeding RGs is present below this depth.

The Army shall be responsible for implementation, maintenance, periodic reporting, and enforcement of LUCs in accordance with the RD. As part of the Army's inspection and reporting responsibilities, periodic reviews will be undertaken and review reports will be submitted at a frequency determined by site-specific conditions. Although the Army may transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall remain ultimately responsible for remedy integrity and shall: i) perform CERCLA 121(c) Five-Year Reviews; ii) notify the appropriate regulators and/or local government representatives of any known LUC deficiencies or violations; iii) provide access to the property to conduct any necessary response; iv) retain the ability to change, modify, or terminate LUCs and any related deed or lease provisions; and v) ensure that the LUC objective is met to maintain remedy protectiveness.

The LUCs will be implemented through the APG Master Planning system with geographic information support.

As a condition of property transfer or lease, the Army may require the transferee or lessee in cooperation with other stakeholders to assume responsibility for various implementation actions. Third party LUC responsibility will be incorporated into pertinent contractual, property, and remedial documentation, such as a purchase agreement, deed, and lease. To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users. If the Army intends to transfer ownership of any site, the Army may, if Federal and/or State law allows, upon transfer of fee title, grant the State an environmental covenant or easement that would allow the State to enforce LUC terms and conditions against the transferee(s), as well as subsequent property owner(s) or user(s) or their contractors, tenants, lessees, or other parties. This covenant will be incorporated by reference in the transfer deed and will run with the land in accordance with State realty law. This state enforcement right would supplement, not replace, the Army's right and responsibility to enforce the LUCs.

- **Public Education Programs:** APG has a very active public education program already in place. The community plays an important role in the selection and implementation of remedial actions at APG. Educational programs will be developed to inform workers and local residents of the potential hazards due to the presence of residual contaminants in the soil at the BRDA. This will be achieved through public meetings, RAB meetings, presentations at local schools, press releases, and posted signs. In addition, a Public

Protection Plan will be prepared that will describe the safety precautions (such as shelter in place) to prevent harm to the surrounding community.

- **CERCLA 121(c) Five-Year Reviews.** Five-Year Reviews will be conducted for these areas (in conjunction with the periodic APG-EA NPL site review) to assess the long-term effectiveness of the remedy (including the LUCs), until COCs in soil are detected at levels that allow for unlimited use and unrestricted exposure.

12.3 Summary of Estimated Remedy Costs

The information in the cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative and post-remediation verification. This is an engineering cost estimate that is expected to be within -30 to +50 percent of the actual project cost (USEPA, 1999; USEPA, 2000). The estimated cost for each site assumes that all excavated soil will be disposed at an approved off-site facility.

The estimated cost for the Selected Remedies for the two areas include total capital cost, annual O&M costs, and present worth over a 30-year period.

The estimated costs (present worth) for these areas are provided below:

➢ Salvage Yard Soil Area		$2,544,000
➢ BRDA		$5,319,000
	Total	$7,863,000

Tables 17 and 18 (pp. 106 and 107) show the cost breakdown for each of these remedies.

12.4 Expected Outcomes of Selected Remedies

The purpose of the excavation response action is to control risks associated with contaminated soil at the two subject G-Street Salvage Yard areas and to minimize the migration of contaminants to nearby wetlands and surface water bodies. **Table 19** (p. 109) presents the expected outcomes for the Selected Remedies, and **Tables 20 and 21** (pp. 110 and 111) show the soil cleanup levels for each chemical of concern. Groundwater is not addressed in this ROD, but will be addressed under a separate remedial response process.

This action will remediate soil by excavation, and following remediation verify that exposure levels do not pose unacceptable risk to workers or ecological receptors. This action will also provide additional uncontaminated land for industrial/military use.

The following remedial performance standards were established for the two subject areas:

- Remove Salvage Yard surface soil within the excavation footprint to a depth of 0 to 2 feet bgs. Delineation samples will be used to identify the actual limits of the excavation area. Remove BRDA surface soil exceeding RGs outside of the pit footprint to a depth of 0 to

2 feet bgs. Delineation samples will be used to identify the actual limits of the surface soil excavation area. Remove BRDA residue material and contaminated soil from the pit area to the full depth of the pit (estimated to be 8 feet bgs) and until confirmation samples are within acceptable risk range.

- Establish a restriction in the Installation Master Plan prohibiting development and use of the property for future military family housing, elementary and secondary schools, child care facilities, playgrounds, and non-military residential land use until COCs in the soil are detected at levels that allow for unlimited use and unrestricted exposure.

13 STATUTORY DETERMINATIONS

The selected remedies for these areas are protective of human and ecological receptors. The excavation of contaminated soil will also minimize the potential for future transport of contaminants to nearby wetlands and surface water bodies.

13.1 Protection of Human Health and the Environment

To complete a streamlined response, USEPA and MDE support the Selected Remedies for the Salvage Yard Soil Area and BRDA as necessary to adequately and cost-effectively protect human health and the environment. The Selected Remedies for these areas are protective of human health and the environment, and address the contaminated media posing unacceptable risks at the site. Through a combination of excavation and LUCs, exposure to elevated levels of contaminants in soil will be reduced, if not eliminated, for military/industrial workers, trespassers, and ecological receptors; and residential land use will be prevented.

The Selected Remedies for these two areas and associated remedial activities do not pose a risk to remedial workers. Trained personnel following proper health and safety procedures will conduct all intrusive activities. RAOs will be achieved upon completion of the remedial activities.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

Salvage Yard Soil Area

There are no Federal or State chemical-specific ARARs for the COCs at the Salvage Yard Soil Area. For the Selected Remedy, all soil determined to contain COCs at concentrations exceeding calculated chemical-specific RGs protective of commercial/industrial use will be excavated and replaced with clean soil. This remedy can be performed in compliance with the action- and location-specific ARARs as identified in the Final FS Sections 2.2.2 and 2.2.3. A detailed assessment of the compliance of the Selected Remedy with ARARs is presented in **Table 15**, p. 101.

The soil removal will be accomplished in a manner that complies with the Maryland regulations requiring control of fugitive particulate emissions and control of erosion and stormwater/sediment runoff. Wastes generated by the remediation will be managed in compliance with COMAR solid and hazardous waste management regulations (where applicable). Any discharge of decontamination wastewater from remedial activities will be conducted in accordance with NPDES substantive requirements.

There are no ARARs associated with the LUCs.

Burn Residue Disposal Area

There are no Federal or State chemical-specific ARARs for the COCs at the BRDA. The Selected Remedy involves the excavation of BRDA materials and soil determined to contain COCs at concentrations exceeding calculated chemical-specific RGs protective of commercial/industrial use This remedy can be performed in compliance with the action- and location-specific ARARs as identified in the Final FS Sections 2.2.2 and 2.2.3. A detailed assessment of the compliance of the Selected Remedy with ARARs is presented in **Table 15**, p. 101.

The soil removal will be accomplished in a manner that complies with Maryland regulations requiring control of fugitive particulate emissions and control of erosion and stormwater/sediment runoff. Wastes generated by the remediation will be managed in compliance with COMAR solid and hazardous waste management regulations (where applicable). Any discharge of decontamination wastewater from remedial activities will be conducted in accordance with NPDES substantive requirements.

There are no ARARs associated with the LUCs.

13.3 Cost-Effectiveness

The Selected Remedies for the Salvage Yard Soil Area and BRDA are considered cost-effective because their costs are proportional to their overall effectiveness. They are sufficiently protective of human health and the environment, and comply with action- and location-specific ARARs. The remedies provide long-term effectiveness and permanence through the removal of contaminated soil above RGs. The Selected Remedies are also easily implemented, utilizing proven techniques and readily available earth-moving equipment for waste removal. These remedies do not include a treatment component; therefore, there will be no reduction in toxicity, mobility, or volume through treatment; however, exposure to contaminated soil at these two areas will be significantly reduced or eliminated.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Remedies for the Salvage Yard Soil Area and BRDA utilize permanent solutions to protect ecological receptors by removing contaminated soil from the site. Alternative treatment technologies were screened for effectiveness, implementability, and cost in the FS Report; however, they were rejected because the waste volumes were considered too small for treatment to be cost-effective.

13.5 Preference for Treatment as a Principal Element

As mentioned previously, treatment technologies were thoroughly screened for effectiveness, implementability, and cost in the FS. The Selected Remedies do not utilize these technologies to reduce the toxicity, mobility, or volume of the contaminated soil because of high costs and lack of performance advantages. The Excavation and Off-Site Disposal remedy eliminates the principal risks at each site through removal of the contaminated soil. Because the individual areas are small, treatment remedies are impractical. The Selected Remedies do not satisfy the statutory preference for treatment as a principal element.

13.6 Five-Year Review Requirement

Hazardous substances, pollutants, or contaminants may remain on-site above levels that allow for unlimited use and unrestricted exposure; therefore, CERCLA 121(c) Five-Year Reviews will be performed for the Salvage Yard Soil Area and the BRDA.

14 DOCUMENTATION OF SIGNIFICANT CHANGES

The cover constructed as part of Alternative 2 for the Burn Residue Disposal Area (Improve and Extend Existing Cover) would not meet RCRA ARARs if the area is considered a landfill. At the time the Proposed Plan was issued for this site, the need for an ARARs waiver [40 CFR Section 300.430(f)(1)(ii)(C)] for that alternative was not identified and was not included in the Proposed Plan. A more detailed analysis of ARARs during the development of this ROD, however, indicates that a waiver would be necessary if that remedy were selected.

In that case, the issuance of a new Proposed Plan would be necessary along with an associated additional public comment period. Although this alternative would typically be screened out of the ROD for non-compliance with the ARARs criteria, it has been retained in this ROD because it was one of the alternatives presented in the Proposed Plan for the site. Alternative 2 for the Burn Residue Disposal Area was not selected. The need for an ARARs waiver for this alternative was a consideration in selecting the Excavation and Off-Site Disposal Alternative (Alternative 3) for the Burn Residue Disposal Area.

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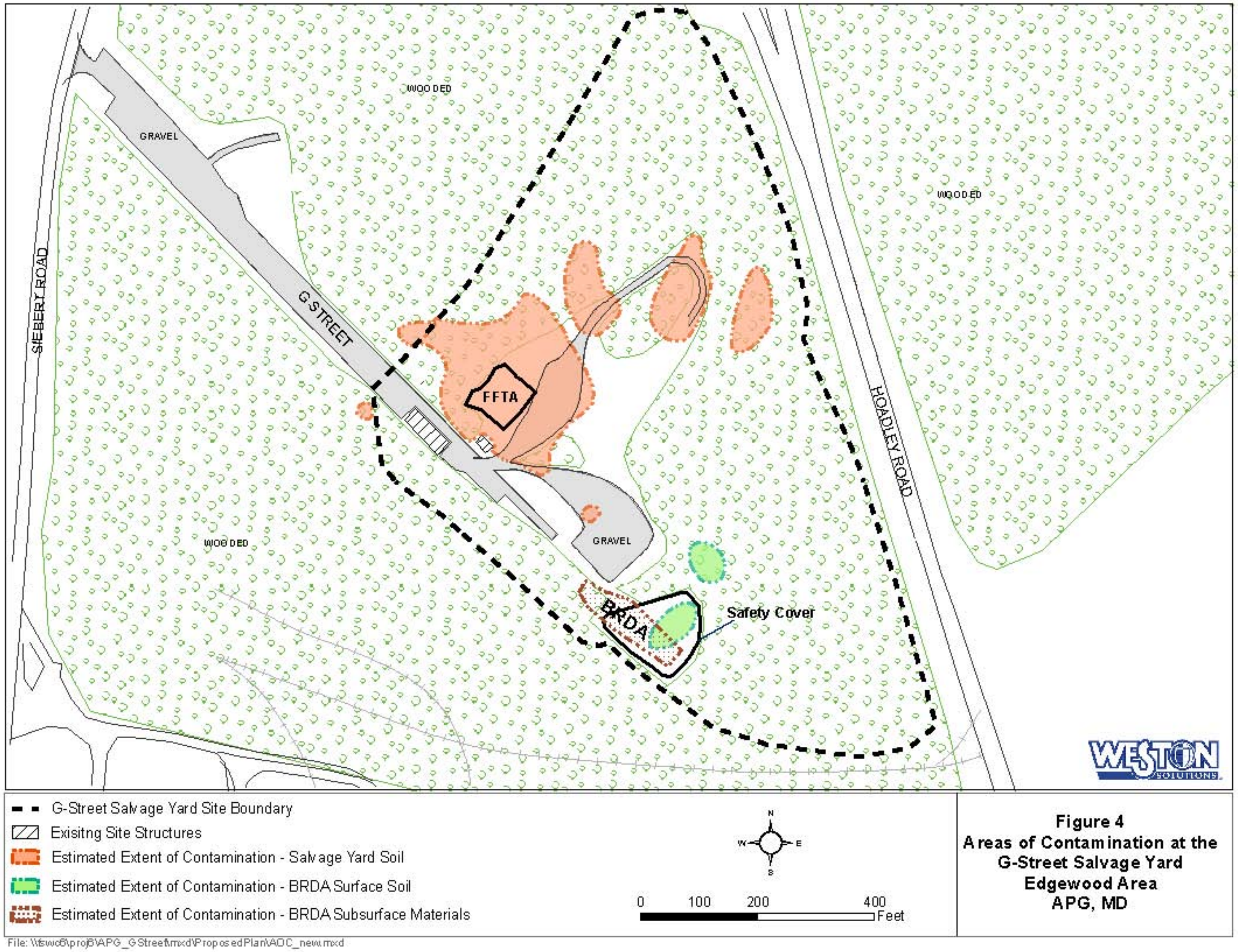

Figure 4. Areas of Contamination at the G-Street Salvage Yard

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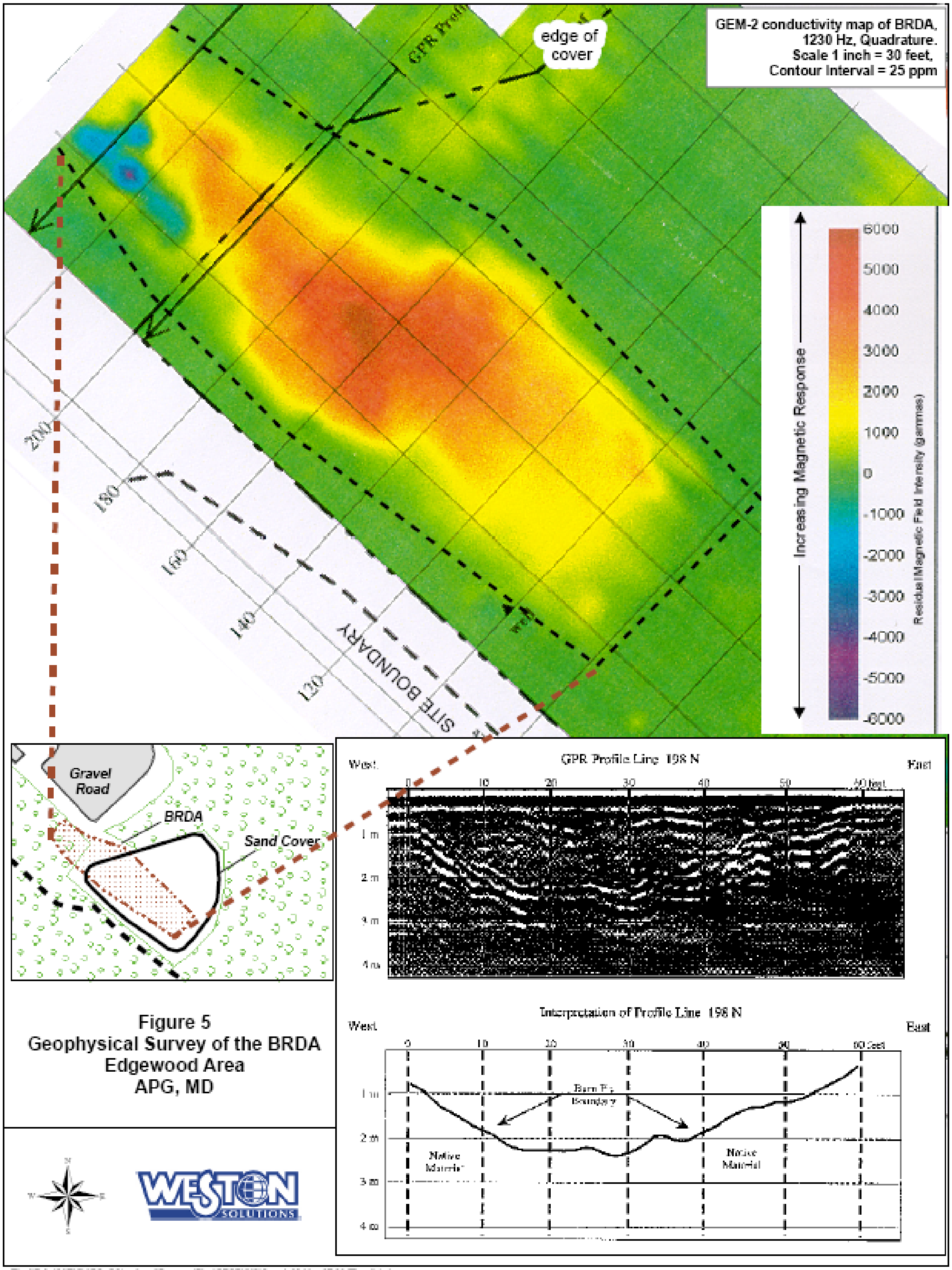

Figure 5. Geophysical Survey of the BRDA

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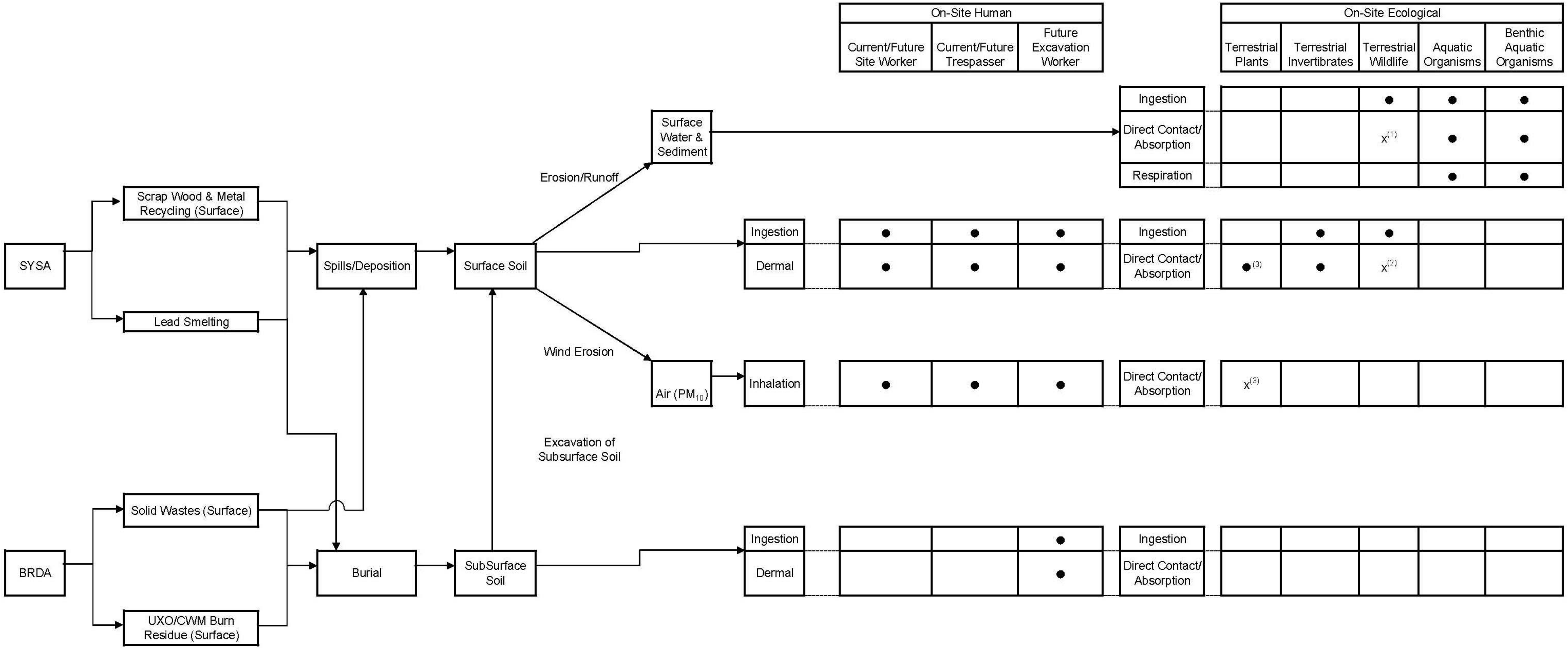

●	Pathway Complete, Quantitative Evaluation
X	Pathway is or May be Complete, Judged to be Minor, Qualitative Evaluation
x	Pathway is or May be Complete, Insufficient Data, Not Evaluated (see notes)
	Pathway is not Complete, No Evaluation Required

SYSA = Salvage Yard Soil Area
BRDA = Burn Residue Disposal Area

Notes:
1 Not evaluated. Applicable exposure and toxicity data could not be found in literature. Pathway is likely insignificant because dermal contact with surface water is likely to be limited.
2 Not evaluated. Applicable exposure data could not be found in literature. Pathway is likely insignificant in comparison to ingestion pathway due to fur/feather barrier.
3 Root uptake was evaluated quantitatively. Foliar uptake not evaluated because applicable exposure and toxicity data could not be found in literature.

Sources: 1) Phase II Remedial Investigation Report for IRP Sites 2, 6, and 46 in Canal Creek Area, Shaw 2003; 2) 3 Sites in Canal Creek Study Area Feasibility Study, Shaw 2005.

Figure 6. G-Street Conceptual Site Model

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Table 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Soil

Exposure Point	Chemical of Potential Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Salvage Yard Soils								
	Aluminum	3.00E+06	4.70E+07	µg/kg	23/23	4.70E+07	µg/kg	MAX
	Antimony	3.60E+02	1.80E+05	µg/kg	14/14	1.80E+05	µg/kg	MAX
	Arsenic	4.00E+03	1.30E+04	µg/kg	14/14	1.30E+04	µg/kg	MAX
	Barium	4.20E+04	1.20E+06	µg/kg	23/23	1.20E+06	µg/kg	MAX
	Cadmium	2.60E+02	1.60E+05	µg/kg	16/18	1.60E+05	µg/kg	MAX
	Chromium	1.20E+04	1.20E+06	µg/kg	22/22	1.20E+06	µg/kg	MAX
	Copper	1.40E+04	9.80E+06	µg/kg	23/23	9.80E+06	µg/kg	MAX
	Iron	6.70E+06	1.10E+08	µg/kg	23/23	1.10E+08	µg/kg	MAX
	Lead	3.90E+04	8.30E+07	µg/kg	28/28	8.30E+07	µg/kg	MAX
	Manganese	7.90E+04	1.10E+06	µg/kg	23/23	1.10E+06	µg/kg	MAX
	Mercury	6.00E+01	1.10E+04	µg/kg	11/11	1.10E+04	µg/kg	MAX
	Silver	4.60E+02	7.20E+04	µg/kg	4/6	7.20E+04	µg/kg	MAX
	Thallium	NA	3.00E+03	µg/kg	1/3	3.00E+03	µg/kg	MAX
	Vanadium	2.20E+04	7.50E+04	µg/kg	11/11	7.50E+04	µg/kg	MAX
	Zinc	6.60E+04	5.10E+06	µg/kg	21/21	5.10E+06	µg/kg	MAX
	Benzo(a)anthracene	4.80E+01	9.90E+03	µg/kg	8/12	9.90E+03	µg/kg	MAX
	Benzo(a)pyrene	1.30E+01	6.10E+03	µg/kg	16/26	6.10E+03	µg/kg	MAX
	Benzo(b)fluoranthene	6.40E+01	9.60E+03	µg/kg	18/26	9.60E+03	µg/kg	MAX
	Chloromethane	NA	2.00E+00	µg/kg	3/18	2.00E+00	µg/kg	MAX
	Dibenz(a,h)anthracene	4.70E+01	1.30E+03	µg/kg	6/26	1.30E+03	µg/kg	MAX
	Ideno(1,2,3-cd)pyrene	4.70E+01	3.90E+03	µg/kg	5/11	3.90E+03	µg/kg	MAX

Table 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations (Continued)

Exposure Point	Chemical of Potential Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
	TCPU	NA	3.00E+04	µg/kg	1/2	3.00E+04	µg/kg	MAX
	Aroclor 1254	NA	1.50E+04	µg/kg	1/12	1.50E+04	µg/kg	MAX
	Aroclor 1260	2.60E+02	6.20E+04	µg/kg	21/26	6.20E+04	µg/kg	MAX
	Delta-BHC	1.10E+02	2.20E+02	µg/kg	2/12	2.20E+02	µg/kg	MAX
	4,4'-DDE	1.70E+01	4.50E+03	µg/kg	27/27	4.50E+03	µg/kg	MAX
	4,4'-DDT	9.60E+00	7.70E+03	µg/kg	8/12	7.70E+03	µg/kg	MAX
	Heptachlor	7.00E+00	2.20E+02	µg/kg	3/12	2.20E+02	µg/kg	MAX
	Heptachlor epoxide	1.80E+00	1.20E+02	µg/kg	5/13	1.20E+02	µg/kg	MAX
	Total TEQ	2.70E-02	5.50E-01	µg/kg	6/6	5.50E-01	µg/kg	MAX
BRDA								
	Aluminum	2.10E+06	8.00E+06	µg/kg	5/5	8.00E+06	µg/kg	MAX
	Antimony	2.80E+02	3.80E+03	µg/kg	5/5	3.80E+03	µg/kg	MAX
	Arsenic	NA	9.00E+03	µg/kg	1/1	9.00E+03	µg/kg	MAX
	Chromium	9.20E+03	1.20E+05	µg/kg	5/5	1.20E+05	µg/kg	MAX
	Copper	1.20E+05	5.80E+06	µg/kg	5/5	5.80E+06	µg/kg	MAX
	Iron	6.40E+08	5.60E+07	µg/kg	5/5	5.60E+07	µg/kg	MAX
	Manganese	1.10E+05	4.90E+05	µg/kg	5/5	4.90E+05	µg/kg	MAX
	Mercury	1.20E+02	1.10E+03	µg/kg	2/5	1.10E+03	µg/kg	MAX
	Benzo(a)pyrene	NA	6.10E+02	µg/kg	1/6	6.10E+02	µg/kg	MAX
	Benzo(b)fluoranthene	1.50E+02	9.60E+02	µg/kg	2/6	9.60E+02	µg/kg	MAX
	Dibenz(a,h)anthracene	NA	2.50E+02	µg/kg	1/6	2.50E+02	µg/kg	MAX
	Aroclor 1260	NA	4.40E+02	µg/kg	1/6	4.40E+02	µg/kg	MAX
	Delta-BHC	1.50E+00	2.80E+00	µg/kg	2/6	2.80E+00	µg/kg	MAX

Key:

µg/kg: micrograms per kilogram
95% UCL: 95% Upper Confidence Level
MAX: Maximum Concentration
NA: Not Applicable

Table 2

Cancer Toxicity Data Summary – Ingestion

Pathway: Ingestion, Dermal

Chemical	Oral Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YY)[1]
Organics					
Aroclor 1254	2.00E+00	(mg/kg-day)-1	B2	IRIS	7/29/03:6/1/97
Aroclor 1260	2.00E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:6/1/97
Benzene	5.50E-02	(mg/kg-day)-1	A	IRIS	7/29/03:1/19/00
Benzo(a)anthracene	7.30E-01	(mg/kg-day)-1	B2	IRIS	2/8/01:3/1/94
Benzo(a)pyrene	7.30E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:11/1/94
Benzo(b)fluoranthene	7.30E-01	(mg/kg-day)-1	B2	IRIS	2/8/01:3/1/94
Benzo(e)pyrene	N/A	N/A	N/A	N/A	N/A
Benzothiazole	N/A	N/A	N/A	N/A	N/A
delta-BHC	N/A	N/A	N/A	N/A	N/A
N,n-Bis(2,4,6-trichlorophenyl) urea	N/A	N/A	N/A	N/A	N/A
Chloroform[2]	N/A	N/A	B2	IRIS	7/29/03:10/19/01
Chloromethane	N/A	N/A	N/A	N/A	N/A
P-Chlorophenylmethylsulfide	N/A	N/A	N/A	N/A	N/A
Clionasterol	N/A	N/A	N/A	N/A	N/A
4,4'-DDE	3.40E-01	(mg/kg-day)-1	B2	IRIS	2/8/01:8/22/88
4,4'-DDT	3.40E-01	(mg/kg-day)-1	B2	IRIS	2/8/01:5/1/99
Dibenz(a,h)anthracene	7.30E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:3/1/94
cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A
trans-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A
Dimethyldisulfide	N/A	N/A	N/A	N/A	N/A
4,6-Dinitro-2-methylphenol	N/A	N/A	N/A	N/A	N/A
2-amino-4,6-Dinitrotoluene	N/A	N/A	N/A	N/A	N/A
Heptachlor	4.50E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:7/1/93

Table 2

Cancer Toxicity Data Summary – Ingestion (Continued)

Chemical	Oral Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YY)[(1)]
Heptachlor Epoxide	9.10E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:7/1/93
Hexadecanoic acid	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	7.30E-01	(mg/kg-day)-1	B2	IRIS	2/8/01:3/1/94
Methyl phosphonic acid	N/A	N/A	N/A	N/A	N/A
Nitroglycerin	1.40E-02	(mg/kg-day)-1	---	NCEA	No Date
Nonacosane	N/A	N/A	N/A	N/A	N/A
1,4-Oxathiane	N/A	N/A	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	2.00E-01	(mg/kg-day)-1	C	IRIS	2/8/01:2/1/94
Tetrachloroethene[(3)]	5.40E-01	(mg/kg-day)-1	---	USEPA, 2003	6/17/2003
1,1,2-Trichloroethane	5.70E-02	(mg/kg-day)-1	C	IRIS	2/8/01:2/1/94
Trichloroethene	4.00E-01	(mg/kg-day)-1	B1	NCEA	8/1/2001
Vinyl chloride (adult)	7.20E-01	(mg/kg-day)-1	A	IRIS	7/29/03:8/7/00
Vinyl chloride (lifetime)	1.40E+00	(mg/kg-day)-1	A	IRIS	7/29/03:8/7/00
Dioxins					
2,3,7,8 Tetrachlorodibenzodioxin	1.50E+05	(mg/kg-day)-1	B2	HEAST	USEPA 1997
Inorganics					
Aluminum	N/A	N/A	N/A	N/A	N/A
Antimony	N/A	N/A	N/A	N/A	N/A
Arsenic	1.50E+00	(mg/kg-day)-1	A	IRIS	2/8/01:4/10/98
Barium	N/A	N/A	N/A	N/A	N/A
Cadmium (food)	N/A	N/A	N/A	N/A	N/A
Chromium (VI)	N/A	N/A	N/A	N/A	N/A
Cobalt	N/A	N/A	N/A	N/A	N/A
Copper	N/A	N/A	N/A	N/A	N/A
Iron	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	N/A	N/A	N/A

Table 2

Cancer Toxicity Data Summary – Ingestion (Continued)

Chemical	Oral Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YY)(1)
Mercury	N/A	N/A	N/A	N/A	N/A
Nickel	N/A	N/A	N/A	N/A	N/A
Silver	N/A	N/A	N/A	N/A	N/A
Sodium	N/A	N/A	N/A	N/A	N/A
Thallium	N/A	N/A	N/A	N/A	N/A
Vanadium	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A
Miscellaneous					
Nitrite	N/A	N/A	N/A	N/A	N/A
Nitrogen, ammonia	N/A	N/A	N/A	N/A	N/A
Phosphorus (Total)	N/A	N/A	N/A	N/A	N/A

Key:
N/A = Not Available
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

(1) For IRIS values, the date IRIS was searched and the date of the most recent review are provided.
For HEAST values, the date of HEAST is provided.
For NCEA values, the date of the article provided by NCEA is provided.
(2) For chloroform, a dose of 0.01 mg/kg-day (equal to the RfD) can be considered protective against cancer risk.
(3) Toxicity value from memorandum "Risk-Based Concentration Table: Update to April 2003 Version" from USEPA Region III Technical Support Section, dated June 17, 2003 (USEPA, 2003c).

USEPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity against cancer risk

Table 3

Cancer Toxicity Data Summary – Inhalation

Pathway: Inhalation

Chemical	Unit Risk	Units	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YY)[1]
Organics							
Benzene	7.80E-06	(μg/m^3)-1	2.90E-02	(mg/kg-day)-1	A	IRIS	7/29/03:1/19/00
Benzo(e)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
n,n-Bis(2,4,6-trichlorophenyl)urea	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	2.30E-05	(μg/m^3)-1	8.10E-02	(mg/kg-day)-1	B2	IRIS	2/8/01:3/1/91
Clionasterol	N/A	N/A	N/A	N/A	N/A	N/A	N/A
cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
trans-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,2-Dichloroethene (total)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dimethyl phthalate	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-amino-4,6-Dinitrotoluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor	1.30E-03	(μg/m^3)-1	4.50E+00	(mg/kg-day)-1	B2	IRIS	8/18/03:7/01/93
Heptachlor Epoxide	2.60E-03	(μg/m^3)-1	9.10E+00	(mg/kg-day)-1	B2	IRIS	2/8/01:7/1/93
Hexadecanoic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hexane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methyl phosphonic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitroglycerin	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nonacosane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	5.80E-05	(μg/m^3)-1	2.00E-01	(mg/kg-day)-1	C	IRIS	2/8/01:2/1/94
Tetrachloroethene[2]	5.80E-06	(μg/m^3)-1	2.00E-02	(mg/kg-day)-1	---	USEPA, 2003	4/25/2003
1,1,2-Trichloroethane	1.60E-05	(μg/m^3)-1	5.60E-02	(mg/kg-day)-1	C	IRIS	2/8/01:2/1/94
Trichloroethene	1.10E-04	(μg/m^3)-1	4.00E-01	(mg/kg-day)-1	---	NCEA	8/1/2001
Vinyl Chloride (adult)	4.40E-06	(μg/m^3)-1	1.50E-02	(mg/kg-day)-1	A	IRIS	7/29/03:8/7/00
Vinyl Chloride (lifetime)	8.80E-06	(μg/m^3)-1	3.00E-02	(mg/kg-day)-1	A	IRIS	7/29/03:8/7/00

Table 3

Cancer Toxicity Data Summary – Inhalation (Continued)

Chemical	Unit Risk	Units	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YY)(1)
Inorganics							
Arsenic	4.30E-03	(µg/m^3)-1	1.51E+01	(mg/kg-day)-1	A	IRIS	8/15/02:4/10/98
Cadmium	1.80E-03	(µg/m^3)-1	6.30E+00	(mg/kg-day)-1	B1	IRIS	2/19/01:6/01/92
Chromium	1.20E-02	(µg/m^3)-1	4.10E+01	(mg/kg-day)-1	A	IRIS	2/8/01:9/3/98
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Key:
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment

(1) For IRIS values, the date IRIS was searched and the date of the most recent review are provided.
For HEAST values, the date of HEAST is provided.
For NCEA values, the date of the article provided by NCEA is provided.
(2) Toxicity value from USEPA Region III Risk-Based Concentration Table, dated April 25, 2003.

USEPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Table 4

Non-Cancer Toxicity Data Summary – Ingestion

Pathway: Ingestion, Dermal

Chemical	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)(1)
Organics							
Aroclor 1254	Chronic	2.00E-05	mg/kg-day	Immune System, Eyes	300	IRIS	2/8/01:2/16/94
Aroclor 1260	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	Chronic	4.00E-03	mg/kg-day	Blood	300	IRIS	7/29/03:4/17/03
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(e)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzothiazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A
delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N,n-Bis(2,4,6-trichlorophenyl)urea	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	Chronic	1.00E-02	mg/kg-day	Liver	1,000	IRIS	7/29/03:9/1/92
Chloromethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P-Chlorophenylmethylsulfide	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clionasterol	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-DDT	Chronic	5.00E-04	mg/kg-day	Liver	100	IRIS	2/8/01:2/1/96
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
cis-1,2-Dichloroethene	Chronic	1.00E-02	mg/kg-day	Blood Chemistry	3,000	HEAST	1997
trans-1,2-Dichloroethene	Chronic	2.00E-02	mg/kg-day	Blood Chemistry	1,000	IRIS	2/8/01:1/1/89
Dimethyldisulfide	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-amino-4,6-Dinitrotoluene(2)	N/A	6.00E-05	mg/kg-day	Liver, Erythrocyte	10,000	NCEA	2/23/1993
Heptachlor	Chronic	5.00E-04	mg/kg-day	Liver	300	IRIS	2/8/01:3/1/91
Heptachlor Epoxide	Chronic	1.00E-05	mg/kg-day	Liver	1,000	IRIS	2/8/01:3/1/91
Hexadecanoic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 4

Non-Cancer Toxicity Data Summary – Ingestion (Continued)

Chemical	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)(1)
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methyl phosphonic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitroglycerin	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nonacosane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Oxathiane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	Chronic	6.00E-02	mg/kg-day	Liver	300	NCEA	6/24/1998
Tetrachloroethene	Chronic	1.00E-02	mg/kg-day	Liver, >Body Weight	1,000	IRIS	7/29/03:3/1/88
1,1,2-Trichloroethane	Chronic	4.00E-03	mg/kg-day	Clinical Chemistry	1,000	IRIS	2/8/01:2/1/95
Trichloroethene	Chronic	3.00E-04	mg/kg-day	Liver, Kidney. Developing Fetus	3,000	NCEA	8/1/2001
Vinyl chloride	Chronic	3.00E-03	mg/kg-day	Liver	30	IRIS	7/29/03:8/7/00
Dioxin							
2,3,7,8 Tetrachlorodibenzodioxin	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inorganics							
Aluminum	Chronic	1.00E+00	mg/kg-day	Developmental Neurotoxicity	100	NCEA	8/26/1996
Antimony	Chronic	4.00E-04	mg/kg-day	Blood Chemistry	1,000	IRIS	2/8/01:2/1/91
Arsenic	Chronic	3.00E-04	mg/kg-day	Skin, Vascular Effects	3	IRIS	2/8/01:2/1/93
Barium	Chronic	7.00E-02	mg/kg-day	Kidney	100	IRIS	2/8/01:3/30/98
Cadmium (food)	Chronic	1.00E-03	mg/kg-day	Kidney	10	IRIS	2/8/01:2/1/94
Chromium (VI)	Chronic	3.00E-03	mg/kg-day	NOAEL	900	IRIS	2/8/01:9/3/98
Cobalt	Chronic	2.00E-02	mg/kg-day	N/A	N/A	USEPA, 2003	4/25/2003
Copper	Chronic	4.00E-02	mg/kg-day	<Body Weight	N/A	NCEA	N/A
Iron	Chronic	3.00E-01	mg/kg-day	GI Irritation	1	NCEA	7/23/1996
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese (non-food)	Chronic	2.00E-02	mg/kg-day	CNS	3	IRIS	2/8/01:5/1/96
Mercury (methyl)	Chronic	1.00E-04	mg/kg-day	Developmental Neurotoxicity	10	IRIS	2/14/01:5/1/95

Table 4

Non-Cancer Toxicity Data Summary – Ingestion (Continued)

Chemical	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)(1)
Nickel	Chronic	2.00E-02	mg/kg-day	<Body Weight	300	IRIS	2/8/01:12/1/96
Silver	Chronic	5.00E-03	mg/kg-day	Skin	3	IRIS	2/8/01:12/1/96
Sodium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium(3)	Chronic	8.00E-05	mg/kg-day	Blood Chemistry	3,000	IRIS	2/8/01:9/1/90
Vanadium	Chronic	7.00E-03	mg/kg-day	NOAEL	100	HEAST	1997
Zinc	Chronic	3.00E-01	mg/kg-day	Blood Chemistry	10	IRIS	2/8/01:10/1/92
Miscellaneous							
Nitrogen, ammonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitrite	Chronic	1.00E-01	mg/kg-day	Blood (Methemoglobinemia)	10	IRIS	7/29/03:9/1/97
Phosphorus (total)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Key:
N/A = Not Available
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
USEPA 2003a = USEPA Region III April 25, 2003 RBC table.
RfD – Reference Dose

(1) For IRIS values, the date IRIS was searched and the date of the most recent review are provided.
For HEAST values, the date of HEAST is provided.
For NCEA values, the date of the article provided by NCEA is provided.
(2) Value is based on aminodinitrotoluenes.
(3) The toxicity information for thallium salts was used.

Table 5

Non-Cancer Toxicity Data Summary – Inhalation

Pathway: Inhalation

Chemical	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD [(1)]	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)[(2)]
Organics									
Benzene	Chronic	3.00E-02	mg/m^3	8.60E-03	mg/kg-day	Blood	300	IRIS	7/29/03:4/17/03
Benzo(e)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
delta-BHC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
n,n-Bis(2,4,6-trichlorophenyl)urea	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	Chronic	3.00E-04	mg/m^3	1.40E-02	mg/kg-day	N/A	N/A	USEPA, 2003; NCEA	4/25/2003
Clionasterol	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
trans-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,2-Dichloroethene (total)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dimethyl phthalate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-amino-4,6-Dinitrotoluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor Epoxide	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hexadecanoic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hexane	Chronic	2.00E-01	mg/m^3	5.71E-02	mg/kg-day	Neurotoxicity	300	IRIS	2/19/01:7/1/93
Methyl phosphonic acid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitroglycerin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nonacosane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1,2,2-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 5

Non-Cancer Toxicity Data Summary – Inhalation (Continued)

Chemical	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD (1)	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)(2)
Tetrachloroethane									
Tetrachloroethene	Chronic	5.00E-01	mg/m^3	1.40E-01	mg/kg-day	Kidney, Liver, CNS	N/A	USEPA, 2003; NCEA	6/20/1997
1,1,2-Trichloroethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Trichloroethene	N/A	N/A	N/A	1.00E-02	mg/kg-day	CNS, Liver, Endocrine System	1,000	NCEA	8/1/2001
Vinyl Chloride	Chronic	1.00E-01	mg/m^3	2.80E-02	mg/kg-day	Liver	30	IRIS	7/29/03:8/7/00
Inorganics									
Arsenic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium	Chronic	2.00E-04	mg/m^3	5.70E-05	mg/kg-day	Kidney	N/A	NCEA	3/20/1996
Chromium	Chronic	8.00E-06	mg/m^3	3.00E-05	mg/kg-day	Respiratory System	90	IRIS	2/8/01:9/3/98
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	Chronic	5.00E-05	mg/m^3	1.43E-05	mg/kg-day	Neurobehavioral Function	1,000	IRIS	2/19/01:12/1/93

Key:
N/A = Not Available
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
USEPA 2003a = USEPA Region III April 25, 2003 RBC table.
RfD = Reference Dose
RfC = Reference Concentration
(1) The adjusted inhalation RfD was derived from the RfC value assuming a 70 kg adult inhales 20 m3/day as follows: RfD = RfC * (20 m3/day / 70 kg).
(2) For HEAST values, the date of HEAST is provided.
For NCEA values, the date of the article provided by NCEA is provided.
For IRIS values, the date IRIS was searched and the date of the most recent review are provided.

Table 6

Risk Characterization Summary – Carcinogens

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
						Ingestion	Inhalation	Dermal	Exposure Routes Total
Current/Future									
	Site Worker Adult	Surface Soil	Surface Soil	Salvage Yard - Burn Residue Disposal Area	Aroclor 1260	1.50E-07	---	1.20E-07	2.70E-07
					Benzo(a)pyrene	7.80E-07	---	---	7.80E-07
					Benzo(b)fluoranthene	1.20E-07	---	---	1.20E-07
					Dibenzo(a,h)anthracene	3.20E-07	---	---	3.20E-07
					Arsenic	2.40E-06	---	1.00E-06	3.40E-06
					TOTAL	3.77E-06	---	1.12E-06	4.89E-06
		Surface Soil	Surface Soil	Salvage Yard - Former Fire Training Area [(b)]	Aroclor 1254	5.20E-06	---	4.20E-06	9.40E-06
					Aroclor 1260	2.20E-05	---	1.70E-05	3.90E-05
					Benzo(a)anthracene	4.40E-07	---	---	4.40E-07
					Benzo(a)pyrene	4.50E-06	---	---	4.50E-06
					Benzo(b)fluoranthene	5.30E-07	---	---	5.30E-07
					4,4'-DDE	2.60E-07	---	3.50E-07	6.10E-07
					4,4'-DDT	4.50E-07	---	6.00E-07	1.10E-06
					Dibenz(a,h)anthracene	1.70E-06	---	---	1.70E-06
					Heptachlor	1.70E-07	6.30E-11	2.20E-07	3.90E-07
					Heptachlor Epoxide	1.90E-07	---	2.50E-07	4.40E-07
					Indeno(1,2,3-cd)pyrene	5.00E-07	---		5.00E-07
					Total Dioxin TEQ	1.40E-05	---	5.70E-06	1.97E-05
					Arsenic	3.30E-06	---	1.40E-06	4.70E-06
					Chromium	---	3.20E-07	---	3.20E-07
					TOTAL	5.32E-05	3.20E-07	2.97E-05	8.33E-05
		Surface Soil	Surface Soil	Salvage Yard - Remaining Area [(b)]	Aroclor 1260	6.30E-07	---	5.00E-07	1.13E-06
					Benzo(a)anthracene	9.80E-08	---	---	9.80E-08
					Benzo(a)pyrene	1.00E-06	---	---	1.00E-06
					Benzo(b)fluoranthene	1.20E-07	---	---	1.20E-07
					4,4'-DDE	5.90E-08	---	6.20E-08	1.21E-07
					4,4'-DDT	1.00E-07	---	1.10E-07	2.10E-07
					Dibenz(a,h)anthracene	3.70E-07	---	---	3.70E-07
					Heptachlor	3.80E-08	2.00E-12	3.90E-08	7.70E-08
					Heptachlor Epoxide	4.30E-08	---	4.40E-08	8.70E-08
					Indeno(1,2,3-cd)pyrene	1.10E-07	---	---	1.10E-07
					Total Dioxin TEQ	1.10E-05	---	4.40E-06	1.54E-05
					Arsenic	2.60E-06	---	1.10E-06	3.70E-06
					Chromium	---	2.90E-06	---	2.90E-06
					TOTAL	1.62E-05	2.90E-06	6.26E-06	2.53E-05

Table 6

Risk Characterization Summary – Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk Ingestion	Inhalation	Dermal	Exposure Routes Total
Current/Future (Continued)									
	Trespasser Adolescent	Surface Soil	Surface Soil	Salvage Yard - Burn Residue Disposal Area	Aroclor 1260	3.40E-08	---	2.10E-08	5.50E-08
					Benzo(a)pyrene	1.70E-07	---	---	1.70E-07
					Benzo(b)fluoranthene	2.70E-08	---	---	2.70E-08
					Dibenzo(a,h)anthracene	7.10E-08	---	---	7.10E-08
					Arsenic	5.30E-07	---	1.80E-07	7.10E-07
					TOTAL	8.32E-07	---	2.01E-07	1.03E-06
		Surface Soil	Surface Soil	Salvage Yard - Former Fire Training Area [(b)]	Aroclor 1254	1.20E-06	---	7.30E-07	1.93E-06
					Aroclor 1260	4.90E-06	---	3.00E-06	7.90E-06
					Benzo(a)anthracene	8.30E-08	---	---	8.30E-08
					Benzo(a)pyrene	1.00E-06	---	---	1.00E-06
					Benzo(b)fluoranthene	1.20E-07	---		1.20E-07
					4,4'-DDE	5.90E-08	---	6.20E-08	1.21E-07
					4,4'-DDT	1.00E-07	---	1.10E-07	2.10E-07
					Dibenz(a,h)anthracene	3.70E-07	---		3.70E-07
					Heptachlor	3.80E-08	2.00E-12	3.90E-08	7.70E-08
					Heptachlor Epoxide	4.30E-08	---	4.40E-80	4.30E-08
					Indeno(1,2,3-cd)pyrene	1.10E-07	---	---	1.10E-07
					Total Dioxin TEQ	3.20E-06	---	1.00E-06	4.20E-06
					Arsenic	7.40E-07	---	2.50E-07	9.90E-07
					Chromium		1.10E-07		1.10E-07
					TOTAL	1.20E-05	1.10E-07	5.19E-06	1.73E-05
		Surface Soil	Surface Soil	Salvage Yard Remaining Area	Aroclor 1260	1.40E-07	---	8.80E-08	2.28E-07
					Benzo(a)pyrene	1.40E-07	---	---	1.40E-07
					Benzo(b)fluoranthene	1.60E-08	---	---	1.60E-08
					4,4'-DDE	2.00E-08	---	2.10E-08	4.10E-08
					Dibenz(a,h)anthracene	5.10E-08	---	---	5.10E-08
					Total Dioxin TEQ	2.50E-06	---	7.80E-07	3.28E-06
					Arsenic	5.80E-07	---	1.90E-07	7.70E-07
					Chromium	---	9.50E-08		9.50E-08
					TOTAL	3.45E-06	9.50E-08	1.08E-06	4.62E-06

Table 6

Risk Characterization Summary – Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
						Ingestion	Inhalation	Dermal	Exposure Routes Total
Future									
	Excavation Worker Adult	Total Soil	Total Soil	Salvage Yard - Burn Residue Disposal Area	Aroclor 1260	5.80E-06	---	4.80E-09	5.80E-06
					Benzo(a)pyrene	3.00E-07	---	---	3.00E-07
					Benzo(b)fluoranthene	4.70E-08	---	---	4.70E-08
					Dibenzo(a,h)anthracene	1.20E-07	---	---	1.20E-07
					Arsenic	9.10E-07	---	4.00E-08	9.50E-07
					TOTAL	7.18E-06	---	4.48E-08	7.22E-06
		Total Soil	Total Soil	Salvage Yard - Former Fire Training Area (b)	Aroclor 1254	2.00E-06	---	1.70E-07	2.17E-06
					Aroclor 1260	8.30E-06	---	6.90E-07	8.99E-06
					Benzo(a)anthracene	4.80E-07	---	---	4.80E-07
					Benzo(a)pyrene	3.00E-06	---	---	3.00E-06
					Benzo(b)fluoranthene	4.70E-07	---	---	4.70E-07
					4,4'-DDE	1.00E-07	---	1.40E-08	1.14E-07
					4,4'-DDT	1.10E-07	---	1.50E-08	1.25E-07
					Dibenzo(a,h)anthracene	6.40E-07	---		6.40E-07
					Heptachlor	6.50E-08	2.50E-12	8.90E-12	6.50E-08
					Heptachlor Epoxide	7.30E-08	---	1.00E-08	8.30E-08
					Indeno(1,2,3-cd)pyrene	1.90E-07	---	---	1.90E-07
					Total Dioxin TEQ	5.60E-06	---	2.30E-07	5.83E-06
					Arsenic	1.10E-06	---	4.90E-08	1.15E-06
					Cadmium	---	1.80E-07	---	1.80E-07
					Chromium	---	1.30E-07	---	1.30E-07
					TOTAL	2.21E-05	3.10E-07	1.18E-06	2.36E-05
		Total Soil	Total Soil	Salvage Yard - Remaining Area (b)	Aroclor 1260	1.20E-07	---	9.70E-09	1.30E-07
					Benzo(a)pyrene	2.40E-07	---	---	2.40E-07
					Benzo(b)fluoranthene	1.90E-08	---	---	1.90E-08
					4,4'-DDE	3.20E-08	---	4.40E-09	3.64E-08
					Dibenzo(a,h)anthracene	8.80E-08	---	---	8.80E-08
					Total Dioxin TEQ	4.30E-06	---	1.80E-07	4.48E-06
					Arsenic	7.50E-07	---	3.30E-08	7.83E-07
					Chromium	---	3.10E-09	---	3.10E-09
					TOTAL	5.55E-06	3.10E-09	2.27E-07	5.78E-06

Table 6

Risk Characterization Summary – Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk Ingestion	Inhalation	Dermal	Exposure Routes Total
Future (Continued)									
	Site Worker Adult	Total Soil	Total Soil	Salvage Yard - Burn Residue Disposal Area	Arsenic	2.40E-06	---	1.00E-06	3.40E-06
					TOTAL	2.40E-06	0.00E+00	1.00E-06	3.40E-06
		Soil	Soil	Salvage Yard - Former Fire Training Area [(b)]	Aroclor 1254	5.20E-06	---	4.20E-06	9.40E-06
					Aroclor 1260	2.20E-05	---	1.70E-05	3.90E-05
					Benzo(a)anthracene	1.30E-06	---	---	1.30E-06
					Benzo(a)pyrene	7.80E-06	---	---	7.80E-06
					Benzo(b)fluoranthene	1.20E-06	---	---	1.20E-06
					4,4'-DDE	2.60E-07	---	3.50E-07	6.10E-07
					4,4'-DDT	2.80E-07	---	3.80E-07	6.60E-07
					Dibenzo(a,h)anthracene	1.70E-06	---	---	1.70E-06
					Heptachlor	1.70E-06	6.30E-11	2.20E-07	1.92E-06
					Heptachlor Epoxide	1.90E-07	---	2.50E-07	4.40E-07
					Total Dioxin TEQ	1.40E-05	---	5.70E-06	1.97E-05
					Arsenic	2.90E-06	---	1.20E-06	4.10E-06
					Cadmium	---	4.40E-06	---	4.40E-06
					Chromium	---	3.20E-06	---	3.20E-06
					TOTAL	5.60E-05	7.60E-06	2.80E-05	9.54E-05
		Total Soil	Total Soil	Salvage Yard - Remaining Area [(b)]	Aroclor 1260	3.10E-07	---	2.40E-07	5.50E-07
					Benzo(a)pyrene	6.40E-07	---	---	6.40E-07
					Benzo(b)fluoranthene	5.00E-08	---	---	5.00E-08
					4,4'-DDE	8.40E-08	---	1.10E-07	1.94E-07
					Dibenzo(a,h)anthracene	2.30E-07	---	---	2.30E-07
					Total Dioxin TEQ	1.10E-05	---	4.40E-06	1.54E-05
					Arsenic	2.03E-06	---	8.30E-07	2.86E-06
					Chromium	---	7.70E-08	---	7.70E-08
					TOTAL	1.43E-05	7.70E-08	5.58E-06	2.00E-05

Table 6

Risk Characterization Summary – Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk: Ingestion	Inhalation	Dermal	Exposure Routes Total
Future (Continued)									
	Trespasser Adolescent	Total Soil	Total Soil	Salvage Yard - Burn Residue Disposal Area	SPECIFIC CHEMICALS AND VALUES NOT PRESENTED IN SOURCE DOCUMENT				
					TOTAL	0.00E+00	0.00E+00	0.00E+00	1.0E-06[a]
		Total Soil	Total Soil	Salvage Yard - Former Fire Training Area [b]	Aroclor 1254	1.20E-06	---	7.30E-07	1.93E-06
					Aroclor 1260	4.90E-06	---	3.00E-06	7.90E-06
					Benzo(a)anthracene	2.80E-07	---	---	2.80E-07
					Benzo(a)pyrene	1.70E-06	---	---	1.70E-06
					Benzo(b)fluoranthene	2.70E-07	---	---	2.70E-07
					4,4'-DDE	5.90E-08	---	6.20E-08	1.21E-07
					4,4'-DDT	6.40E-08	---	6.60E-08	1.30E-07
					Dibenzo(a,h)anthracene	3.70E-07	---	---	3.70E-07
					Heptachlor	3.80E-08	2.00E-12	3.90E-08	7.70E-08
					Heptachlor Epoxide	4.30E-08	---	4.40E-08	8.70E-08
					Indeno(1,2,3-cd)pyrene	1.10E-07	---	---	1.10E-07
					Total Dioxin TEQ	3.20E-06	---	1.00E-06	4.20E-06
					Arsenic	6.50E-07	---	2.20E-07	8.70E-07
					Cadmium	---	1.40E-07	---	1.40E-07
					Chromium	---	1.10E-07	---	1.10E-07
					TOTAL	1.29E-05	2.50E-07	5.16E-06	1.83E-05
		Total Soil	Total Soil	Salvage Yard - Remaining Area [b]	Aroclor 1260	6.90E-08	---	4.30E-08	1.12E-07
					Benzo(a)pyrene	1.40E-07	---	---	1.40E-07
					Benzo(b)fluoranthene	1.10E-08	---	---	1.10E-08
					4,4'-DDE	1.90E-08	---	2.00E-08	3.90E-08
					Dibenzo(a,h)anthracene	5.10E-08	---	---	5.10E-08
					Total Dioxin TEQ	2.50E-06	---	7.80E-07	3.28E-06
					Arsenic	4.40E-07	---	1.50E-07	5.90E-07
					Chromium	---	2.50E-09	---	2.50E-09
					TOTAL	3.23E-06	2.50E-09	9.93E-07	4.23E-06

Key:
(a) Although the total risk is equal to or above 1E-06, no single chemical was equal to or above 1E-06 .
(b) Exposure points as identified in the FS (Shaw, 2005). As evaluated for human health risk in the FS, the Salvage Yard Soil Area consists of the Former Fire Training Area and the Remaining Area.
Source: Shaw, 2005. Note that some values may not be exactly identical to the source document due to spreadsheet rounding differences.

Table 7

Risk Characterization Summary – Non-Carcinogens

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
						Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Current/Future										
	Site Worker Adult	Surface Soil	Surface Soil	Salvage Yard-Burn Residue Disposal Area	Aluminum	Dev Neurotoxicity	3.90E-03	---	1.90E-03	5.80E-03
					Antimony	Blood Chemistry	4.60E-03	---	4.10E-03	8.70E-03
					Arsenic	Skin, Vascular	1.50E-02	---	6.20E-03	2.12E-02
					Chromium[b]	NOAEL	1.93-02	---	1.30E-01	1.30E-01
					Cooper	<Body Weight	7.10E-02	---	1.70E-02	8.80E-02
					Iron	GI Irritation	9.20E-02	---	8.10E-02	1.73E-01
					Manganese	CNS	1.20E-02	---	1.60E-03	1.36E-02
					Mercury	Dev Neurotoxicity	5.40E-03		7.50E-04	6.15E-03
					TOTAL		2.04E-01	---	2.43E-01	4.46E-01
		Surface Soil	Surface Soil	Salvage Yard-Former Fire Training Area[(b)]	Aroclor 1254	Immune System	3.70E-01	---	2.90E-01	6.60E-01
					4,4'-DDT	Liver	7.50E-03	---	9.90E-03	1.74E-02
					Heptachlor	Liver	2.10E-04	---	2.80E-04	4.90E-04
					Heptachlor Epoxide	Liver	4.50E-03	---	6.00E-03	1.00E-02
					Aluminum	Dev Neurotoxicity	4.70E-03	---	2.30E-03	7.00E-03
					Antimony	Blood Chemistry	2.30E-01	---	2.00E-01	4.30E-01
					Arsenic	Skin, Vascular	2.00E-02	---	8.60E-03	2.86E-02
					Barium	Kidney	4.40E-03	---	8.20E-03	1.26E-02
					Cadmium	Kidney	7.90E-02	---	4.20E-01	4.99E-01
					Chromium	NOAEL; Respiratory System	2.00E-01	7.40E-03	1.30E+00	1.51E+00
					Copper	<Body Weight	3.50E-02	---	8.00E-03	4.30E-02
					Iron	GI Irritation	5.10E-02	---	4.50E-02	9.60E-02
					Manganese	CNS	1.70E-02	---	2.30E-03	1.93E-02
					Mercury	Dev Neurotoxicity	3.80E-03	---	5.30E-04	4.33E-03
					Thallium	Blood Chemistry	1.80E-02	---	2.40E-03	2.04E-02
					Vanadium	NOAEL	3.10E-03	------	1.30E-02	1.61E-02
					Zinc	Blood Chemistry	4.10E-03	------	5.40E-04	4.64E-03
					TOTAL		1.05E+00	7.40E-03	2.32E+00	3.38E+00
		Surface Soil	Surface Soil	Salvage Yard-Remaining Area [(b)]	Aluminum	Dev Neurotoxicity	8.60E-03	---	4.20E-03	1.28E-02
					Antimony	Blood Chemistry	1.10E-02	---	9.90E-03	2.09E-02
					Arsenic	Skin, Vascular	1.60E-02	---	6.80E-03	2.28E-02
					Barium	Kidney	3.50E-03	---	6.60E-03	1.01E-02
					Cadmium	Kidney	5.20E-03	---	2.80E-02	3.32E-02
					Chromium	NOAEL; Respiratory System	1.30E-01	6.60E-03	8.60E-01	9.97E-01
					Copper	<Body Weight	1.20E-01	---	2.80E-02	1.48E-01
					Iron	GI Irritation	6.60E-02	---	5.80E-02	1.24E-01
					Manganese	CNS	1.70E-02	---	2.30E-03	1.93E-02
					Silver	Skin	7.00E-03	---	2.30E-02	3.00E-02
					Zinc	Blood Chemistry	8.20E-03	---	1.10E-03	9.30E-03
					TOTAL		0.3925	0.0066	1.0279	1.43E+00

Table 7

Risk Characterization Summary – Non-Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
						Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Current/Future (Continued)										
	Trespasser Adolescent	Surface Soil	Surface Soil	Salvage Yard-Burn Residue Disposal Area	Aluminum	Dev Neurotoxicity	2.20E-03	---	8.40E-04	3.04E-03
					Antimony	Blood Chemistry	2.60E-03	---	1.80E-03	4.40E-03
					Arsenic	Skin, Vascular	8.20E-03	---	2.70E-03	1.09E-02
					Chromium[b]	NOAEL	1.10E-02	---	5.70E-02	6.80E-02
					Cooper	<Body Weight	4.00E-02	---	7.30E-03	4.73E-02
					Iron	GI Irritation	5.20E-02	---	3.60E-02	8.80E-02
					Manganese	CNS	6.70E-03	---	7.00E-04	7.40E-03
					Mercury	Dev Neurotoxicity	3.00E-03	---	3.30E-04	3.33E-03
					TOTAL		2.10E+00	---	1.07E-01	2.32E-01
		Surface Soil	Surface Soil	Salvage Yard-Former Fire Training Area [(b)]	Aroclor 1254	Immune System	2.10E-01	---	1.30E-01	3.40E-01
					4,4'-DDT	Liver	4.20E-03	---	4.40E-03	8.60E-03
					Heptachlor	Liver	1.20E-04	---	1.20E-04	2.40E-04
					Heptachlor Epoxide	Liver	2.50E-03	---	2.60E-03	5.10E-03
					Aluminum	Dev Neurotoxicity	2.60E-03	---	1.00E-03	3.60E-03
					Antimony	Blood Chemistry	1.30E-01	---	8.70E-02	2.17E-01
					Arsenic	Skin, Vascular	1.10E-02	---	3.80E-03	1.48E-02
					Barium	Kidney	2.40E-03	---	3.60E-03	6.00E-03
					Cadmium	Kidney	4.40E-02	---	1.80E-01	2.24E-01
					Chromium	NOAEL; Respiratory System	1.10E-01	6.00E-04	5.80E-01	6.91E-01
					Copper	<Body Weight	1.90E-02	---	3.50E-03	2.25E-02
					Iron	GI Irritation	2.90E-02	---	2.00E-02	4.90E-02
					Manganese	CNS	9.63-03	---	1.00E-03	1.00E-03
					Mercury	Dev Neurotoxicity	2.10E-03	---	2.40E-04	2.34E-03
					Thallium	Blood Chemistry	1.00E-02	---	1.10E-03	1.11E-02
					Vanadium	NOAEL	1.70E-03	---	6.00E-03	7.70E-03
					Zinc	Blood Chemistry	2.30E-03	---	2.40E-04	2.54E-03
					TOTAL		5.81E-01	6.00E-04	1.02E+00	1.61E+00
		Surface Soil	Surface	Salvage Yard-Remaining Area [(b)]	Aluminum	Dev Neurotoxicity	4.80E-03	---	1.80E-03	6.60E-03
					Antimony	Blood Chemistry	6.30E-03	---	4.40E-03	1.07E-02
					Arsenic	Skin, Vascular	9.10E-03	---	3.00E-03	1.21E-02
					Barium	Kidney	2.00E-03	---	2.90E-03	4.90E-03
					Cadmium	Kidney	2.90E-03	---	1.20E-02	1.49E-02
					Chromium	NOAEL; Respiratory System	7.30E-02	5.40E-04	3.80E-01	4.54E-01
					Copper	<Body Weight	6.70E-02	---	1.20E-02	7.90E-02
					Iron	GI Irritation	3.70E-02	---	2.60E-02	6.30E-02
					Manganese	CNS	9.70E-03	---	1.00E-03	1.07E-02
					Silver	Skin	3.90E-03	---	1.00E-02	1.39E-02
					Zinc	Blood Chemistry	4.60E-03	---	4.80E-04	5.08E-03
					TOTAL		2.20E-01	5.40E-04	4.54E-01	6.74E-01

Table 7

Risk Characterization Summary – Non-Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
						Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Future										
	Excavation Worker Adult	Total Soil	Total Soil	Salvage Yard - Burn Residue Disposal Area	Aluminum	Dev Neurotoxicity	3.70E-02	---	1.90E-03	3.89E-02
					Antimony	Blood Chemistry	4.50E-02	---	4.10E-03	4.91E-02
					Arsenic	Skin, Vascular	1.40E-01	---	6.20E-03	1.46E-01
					Chromium[b]	NOAEL	1.90E-01	---	1.30E-01	3.20E-01
					Cooper	<Body Weight	6.90E-01	---	1.70E-02	7.07E-01
					Iron	GI Irritation	8.80E-01	---	8.10E-02	9.61E-01
					Manganese	CNS	1.10E-01	---	1.60E-03	1.12E-01
					Mercury	Dev Neurotoxicity	5.20E-02	---	7.50E-04	5.28E-02
					TOTAL		2.1 (a)	---	2.43E-01	2.4 (a)
		Total Soil	Total Soil	Salvage Yard-Former Fire Training Area [(b)]	Aroclor 1254	Immune System, Eyes	3.50E+00	---	2.90E-01	3.79E+00
					4,4'-DDE	Liver	4.50E-02	---	6.20E-03	5.12E-02
					Heptachlor	Liver	2.00E-03	---	2.80E-04	2.28E-03
					Heptachlor Epoxide	Liver	4.30E-02	---	6.00E-03	4.90E-02
					Aluminum	Dev Neurotoxicity	4.00E-02	---	2.10E-03	4.21E-02
					Antimony	Blood Chemistry	7.50E+00	---	6.90E-01	8.19E+00
					Arsenic	Skin	1.70E-01	---	7.60E-03	1.78E-01
					Barium	Kidney	4.90E-02	---	9.50E-03	5.85E-02
					Cadmium	Kidney	5.10E+01	3.40E-02	2.80E+01	7.90E+01
					Chromium	NOAEL, Respiratory System	1.90E+00	7.40E-03	1.30E+00	3.21E+00
					Copper	<Body Weight	6.60E-01	---	1.60E-02	6.76E-01
					Iron	GI Irritation	3.60E-01	---	3.30E-02	3.93E-01
					Manganese	Dev Neurotoxicity	3.10E-02	---	4.50E-04	3.15E-02
					Mercury	Blood Chemistry	1.80E-01	---	2.40E-03	1.82E-01
					Thallium	Blood Chemistry	1.80E-01	---	2.40E-03	1.82E-01
					Vanadium	NOAEL	2.50E-02	---	1.20E-02	3.70E-02
					Zinc	Blood Chemistry	3.40E-02	---	4.70E-04	3.45E-02
					TOTAL		6.57E+01	4.14E-02	3.04E+01	9.61E+01
		Total Soil	Total Soil	Salvage Yard-Remaining Area [(b)]	Aluminum	Dev Neurotoxicity	5.60E-02	---	2.90E-03	5.89E-02
					Antimony	Blood Chemistry	1.10E-01	---	9.90E-03	1.20E-01
					Arsenic	Skin	1.20E-01	---	5.10E-03	1.25E-01
					Barium	Kidney	1.50E-02	---	3.00E-03	1.80E-02
					Cadmium	Kidney	2.90E-03	---	1.60E-03	4.50E-03
					Chromium	NOAEL, Respiratory System	3.30E-02	1.80E-04	2.30E-02	5.62E-02
					Copper	<Body Weight	7.80E-03	---	1.90E-04	7.99E-03
					Iron	GI Irritation	4.80E-01	---	4.40E-02	5.24E-01
					Manganese	Dev Neurotoxicity	2.50E-01	---	3.50E-03	2.54E-01
					Silver	Skin	5.50E-04	---	1.90E-04	7.40E-04
					Zinc	Blood Chemistry	5.70E-02	---	7.90E-04	5.78E-02
					TOTAL		1.13E+00	1.80E-04	9.42E-02	1.23E+00

Table 7

Risk Characterization Summary – Non-Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
						Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Future (Continued)										
	Site Worker Adult	Total Soil	Total Soil	Salvage Yard-Burn Residue Disposal Area	SPECIFIC CHEMICALS AND VALUES NOT PRESENTED IN SOURCE DOCUMENT					
					TOTAL		0.00E+00	0.00E+00	0.00E+00	<1
		Total Soil	Total Soil	Salvage Yard-Former Fire Training Area [(b)]	Aroclor 1254	Immune System	3.70E-01	---	2.90E-01	6.60E-01
					4,4'-DDT	Liver	4.70E-03	---	6.20E-03	1.09E-02
					Heptachlor	Liver	2.10E-04	---	2.80E-04	4.90E-04
					Heptachlor Epoxide	Liver	4.50E-03	---	6.00E-03	1.05E-02
					Aluminum	Dev Neurotoxicity	4.20E-03	---	2.10E-03	6.30E-03
					Antimony	Blood Chemistry	7.90E-01	---	6.90E-01	1.48E+00
					Arsenic	Skin	1.80E-02	---	7.60E-03	2.56E-02
					Barium	Kidney	5.10E-03	---	9.50E-03	1.46E-02
					Cadmium	Kidney	5.30E+00	3.40E-02	2.80E+01	3.33E+01
					Chromium	NOAEL, Respiratory System	2.00E-01	7.40E-03	1.30E+00	1.51E+00
					Copper	<Body Weight	6.90E-02	---	1.60E-02	8.50E-02
					Iron	GI Irritation	3.70E-02	---	3.30E-02	7.00E-02
					Manganese	CNS	1.40E-02	---	1.80E-03	1.58E-02
					Mercury	Dev Neurotoxicity	3.20E-03	---	4.50E-04	3.65E-03
					Thallium	Blood Chemistry	1.80E-02	---	2.40E-03	2.04E-02
					Vanadium	NOAEL	2.60E-03	---	1.20E-02	1.46E-02
					Zinc	Blood Chemistry	3.60E-03	---	4.70E-04	4.07E-03
					TOTAL		6.84E+00	4.14E-02	3.04E+01	3.73E+01
		Total Soil	Total Soil	Salvage Yard-Remaining Area [(b)]	Aluminum	Dev Neurotoxicity	5.90E-03	---	2.90E-03	8.80E-03
					Antimony	Blood Chemistry	1.10E-02	---	9.90E-03	2.09E-02
					Arsenic	Skin	1.20E-02	---	5.10E-03	1.71E-02
					Barium	Kidney	1.60E-03	---	3.00E-03	4.60E-03
					Cadmium	Kidney	3.00E-04	---	1.60E-03	1.90E-03
					Chromium	NOAEL, Respiratory System	3.50E-03	1.80E-04	2.30E-02	2.67E-02
					Copper	<Body Weight	8.10E-04	---	1.90E-04	1.00E-03
					Iron	GI Irritation	5.00E-02	---	4.40E-02	9.40E-02
					Manganese	CNS	2.60E-02	---	3.50E-03	2.95E-02
					Silver	Skin	5.80E-05	---	1.90E-04	2.48E-04
					Zinc	Blood Chemistry	6.00E-03	---	7.90E-04	6.79E-03
					TOTAL		1.17E-01	1.80E-04	9.42E-02	2.12E-01

Table 7

Risk Characterization Summary – Non-Carcinogens (Continued)

Timeframe	Receptor Population and Age	Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
						Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Future (Continued)										
	Trespasser Adolescent	Total Soil	Total Soil	Salvage Yard-Burn Residue Disposal Area	SPECIFIC CHEMICALS AND VALUES NOT PRESENTED IN SOURCE DOCUMENT					
					TOTAL					<1
		Total Soil	Total Soil	Salvage Yard-Former Fire Training Area [(b)]	Aroclor 1254	Immune System	2.10E-01	---	1.30E-01	3.40E-01
					4,4'-DDT	Liver	2.60E-03	---	2.70E-03	5.30E-03
					Heptachlor	Liver	1.30E-04	---	1.20E-04	2.50E-04
					Heptachlor Epoxide	Liver	2.50E-03	---	2.60E-03	5.10E-03
					Aluminum	Dev Neurotoxicity	2.40E-03	---	9.10E-04	3.31E-03
					Antimony	Blood Chemistry	4.40E-01	---	3.00E-01	7.40E-01
					Arsenic	Skin	1.00E-02	---	3.40E-03	1.34E-02
					Barium	Kidney	2.80E-03	---	4.20E-03	7.00E-03
					Cadmium	Kidney	3.00E+00	2.80E-03	1.20E+01	1.50E+01
					Chromium	NOAEL	1.10E-01	6.00E-04	5.80E-01	6.91E-01
					Cooper	<Body Weight	3.90E-02	---	7.10E-03	4.61E-02
					Iron	GI Irritation	2.10E-02	---	1.50E-02	3.60E-02
					Manganese	CNS	7.60E-03	---	7.90E-04	8.39E-03
					Mercury	Dev Neurotoxicity	1.80E-03	---	2.00E-04	2.00E-03
					Thallium	Blood Chemistry	1.00E-02	---	1.10E-03	1.11E-02
					Vanadium	NOAEL	1.50E-03	---	5.10E-03	6.60E-03
					Zinc	Blood Chemistry	2.00E-03	---	2.10E-04	2.21E-03
					TOTAL		3.86E+00	3.40E-03	1.31E+01	1.69E+01
		Total Soil	Total Soil	Salvage Yard-Remaining Area [(b)]	Aluminum	Dev Neurotoxicity	3.30E-03	---	1.30E-03	4.60E-03
					Antimony	Blood Chemistry	6.30E-03	---	4.40E-03	1.07E-02
					Arsenic	Skin	6.80E-03	---	2.30E-03	9.10E-03
					Barium	Kidney	8.80E-04	---	1.30E-03	2.18E-03
					Cadmium	Kidney	1.70E-04	---	7.00E-04	8.70E-04
					Chromium	NOAEL	1.90E-03	1.40E-05	1.00E-02	1.19E-02
					Cooper	<Body Weight	4.50E-04	---	8.30E-05	5.33E-04
					Iron	GI Irritation	2.80E-02	---	2.00E-02	4.80E-02
					Manganese	CNS	1.50E-02	---	1.50E-03	1.65E-02
					Silver	Skin	3.20E-05	---	8.40E-05	1.16E-04
					Zinc	Blood Chemistry	3.30E-03	---	3.50E-04	3.65E-03
					TOTAL		6.61E-02	1.40E-05	4.20E-02	1.08E-01

Key:
(a) Although the total hazard index is above 1, no single chemical hazard quotient was above 1.
(b) Exposure points as identified in the FS (Shaw, 2005). As evaluated for human health risk in the FS, the Salvage Yard Soil Area consists of the Former Fire Training Area and the Remaining Area.
Source: Shaw, 2005. Note that some values may not be exactly identical to the source document due to spreadsheet rounding differences.

Table 8

Occurrence, Distribution, and Selection of Chemicals of Potential Concern – Ecological Risk Assessment

Chemical	Minimum Concentration (1)	Maximum Concentration (1)	Mean Concentration (2)	95% UCL of the Mean (3)	Background Concentration Range	Screening Toxicity Value	Screening Toxicity Value Source (4)	HQ Value (5)	COC Flag (Y or N)
G-Street Salvage Yard Surface Soil									
Organics (ug/kg)									
Acenaphthene	NA	890	164	2.16E+02	ND	100	REGION III BTAG	**8.9**	Y
Acetone	3.91	580	74.9	1.25E+02	ND	NSL	REGION III BTAG	**---**	Y
Acetophenone	NA	94.4	141	2.10E+02	ND	NSL	REGION III BTAG	**---**	Y
Aldrin	0.590	2.20	2.13	3.36E+00	ND	<100	REGION III BTAG	<0.1	N
Anthracene	99.0	3,700	269	4.95E+02	ND	100	REGION III BTAG	**37**	Y
Aroclor 1016	NA	130	153	2.97E+02	ND	100	REGION III BTAG, PCBs	**1.3**	Y
Aroclor 1254	NA	15,000	666	1.61E+03	ND	100	REGION III BTAG, PCBs	**150**	Y
Aroclor 1260	43.0	62,000	*2,650*	5.87E+03	ND	100	REGION III BTAG, PCBs	**620**	Y
Benz(a)anthracene	35.0	9,900	550	1.17E+03	56-230	100	REGION III BTAG	**99**	Y
Benzene	2.42	3.12	1.93	2.53E+00	ND	100	REGION III BTAG	<0.1	N
Benzo(a)pyrene	4.30	6,100	*200*	3.80E+02	60-440	100	REGION III BTAG	**61**	Y
Benzo(b)fluoranthene	36.0	9,600	603	1.20E+03	35-350	100	REGION III BTAG	**96**	Y
Benzo(g,h,i)perylene	46.0	3,500	292	5.15E+02	41-200	100	REGION III BTAG	**35**	Y
Benzo(k)fluoranthene	28.0	4,400	*240*	3.88E+02	29-140	100	REGION III BTAG	**44**	Y
alpha-BHC	NA	1.0	8.89	1.74E+01	ND	<100	REGION III BTAG, lindane	<0.1	N
beta-BHC	0.520	4.90	*2.07*	3.03E+00	ND	<100	REGION III BTAG, lindane	<0.1	N
delta-BHC	2.80	220	14.1	2.93E+01	ND	<100	REGION III BTAG, lindane	**2.2**	Y
gamma-BHC (Lindane)	0.920	0.990	6.16	1.17E+01	ND	<100	REGION III BTAG	<0.1	N
di-n-Butylphthalate	40.0	400	150	1.90E+02	ND	NSL	REGION III BTAG	**---**	Y
Carbazole	49.0	3,600	274	4.95E+02	ND	NSL	REGION III BTAG	**---**	Y

Table 8

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (Continued)

Chemical	Minimum Concentration (1)	Maximum Concentration (1)	Mean Concentration (2)	95% UCL of the Mean (3)	Background Concentration Range	Screening Toxicity Value	Screening Toxicity Value Source (4)	HQ Value (5)	COC Flag (Y or N)
alpha-Chlordane	0.700	69.0	6.50	1.14E+01	ND	<100	REGION III BTAG, chlordane	0.7	N
gamma-Chlordane	0.650	62.0	6.96	1.20E+01	ND	<100	REGION III BTAG, chlordane	0.6	N
Chloromethane	2.0	4.0	2.84	3.69E+00	ND	NSL	REGION III BTAG	---	Y
Chrysene	39.0	12,000	660	1.41E+03	71-380	100	REGION III BTAG	**120**	Y
4,4'-DDD	3.40	2,200	140	2.82E+02	2.8	<100	REGION III BTAG	**22**	Y
4,4'-DDE	5.20	6,800	*365*	7.00E+02	4.1-392	<100	REGION III BTAG	**68**	Y
4,4'-DDT	9.60	12,000	585	1.34E+03	2.6-143	<100	REGION III BTAG	**120**	Y
Dibenz(a,h)anthracene	21.0	1,300	114	1.94E+02	ND	100	REGION III BTAG	**13**	Y
Dibenzofuran	130	570	170	2.08E+02	ND	NSL	REGION III BTAG	---	Y
Dieldrin	NA	2.18	11.1	2.09E+01	ND	<100	REGION III BTAG	<0.1	N
Diethylphthalate	120	260	143	1.74E+02	36-72	NSL	REGION III BTAG	---	Y
Diisopropylmethylphosphonate	2.20	22.9	28.2	4.45E+01	ND	NSL	REGION III BTAG	---	Y
Dimethylphthalate	NA	54.0	136	1.68E+02	ND	NSL	REGION III BTAG	---	Y
Endosulfan I	0.450	1.20	4.61	8.51E+00	ND	NSL	REGION III BTAG	---	Y
Endosulfan sulfate	NA	2.30	5.51	9.41E+00	ND	NSL	REGION III BTAG	---	Y
Endrin	NA	13.0	12.4	2.31E+01	ND	<100	REGION III BTAG	0.13	N
Endrin aldehyde	1.60	10.5	3.23	4.51E+00	ND	<100	REGION III BTAG, endrin	0.11	N
Endrin ketone	0.903	46.0	6.28	9.82E+00	ND	<100	REGION III BTAG, endrin	0.5	N
bis(2-Ethylhexyl)phthalate	51.0	7,810	1,100	1.91E+03	ND	NSL	REGION III BTAG	---	Y
Fluoranthene	69.0	23,000	1,150	2.64E+03	33-320	100	REGION III BTAG	**230**	Y
Fluorene	NA	1,300	179	2.57E+02	ND	100	REGION III BTAG	**13**	Y
Heptachlor	7.0	270	21.0	3.97E+01	ND	<100	heptachlor epoxide	**2.7**	Y
Heptachlor epoxide	1.97	120	11.1	1.98E+01	ND	<100	REGION III BTAG	**1.2**	Y

Table 8

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (Continued)

Chemical	Minimum Concentration (1)	Maximum Concentration (1)	Mean Concentration (2)	95% UCL of the Mean (3)	Background Concentration Range	Screening Toxicity Value	Screening Toxicity Value Source (4)	HQ Value (5)	COC Flag (Y or N)
1,2,3,4,6,7,8-HpCDD	0.0321	0.433	*0.144*	3.16E-01	0.056-0.057	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,4,6,7,8-HpCDF	0.0154	0.448	*0.105*	2.65E-01	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,4,7,8,9-HpCDF	0.0010	0.0334	*0.00860*	2.19E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,4,7,8-HxCDD	0.000790	0.00900	*0.00322*	6.71E-03	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,6,7,8-HxCDD	0.00180	0.0227	0.00890	1.72E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,7,8,9-HxCDD	0.00220	0.0260	*0.0100*	2.07E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,4,7,8-HxCDF	0.00410	0.174	*0.0378*	9.81E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,6,7,8-HxCDF	0.00230	0.0644	*0.0135*	3.48E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,7,8,9-HxCDF	NA	0.00340	0.000667	1.77E-03	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
2,3,4,6,7,8-HxCDF	0.00230	0.0552	*0.0164*	4.08E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Indeno(1,2,3-c,d)pyrene	40.0	3,900	307	5.56E+02	40-210	100	REGION III BTAG	**39**	Y
4-Methyl-2-pentanone	NA	6.0	3.25	4.22E+00	ND	100,000	REGION III BTAG	<0.1	N
2-Methylnaphthalene	46.0	520	160	1.97E+02	ND	NSL	REGION III BTAG	---	Y
4-Methylphenol	NA	110	154	1.82E+02	ND	100	REGION III BTAG	**1.1**	Y
Naphthalene	50.0	370	*155*	1.81E+02	ND	100	REGION III BTAG	**3.7**	Y
OCDD	1.08	7.97	*4.52*	6.80E+00	0.3-9.1	10	REGION III BTAG, 2,3,7,8-TCDD	0.8	N
OCDF	0.0203	0.419	0.138	2.84E-01	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
di-n-Octylphthalate	64.1	190	140	1.74E+02	ND	NSL	REGION III BTAG	---	Y

Table 8

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (Continued)

Chemical	Minimum Concentration (1)	Maximum Concentration (1)	Mean Concentration (2)	95% UCL of the Mean (3)	Background Concentration Range	Screening Toxicity Value	Screening Toxicity Value Source (4)	HQ Value (5)	COC Flag (Y or N)
1,2,3,7,8-PeCDD	0.000590	0.00760	*0.00289*	6.14E-03	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,3,7,8-PeCDF	0.00140	0.0940	*0.0108*	3.42E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
2,3,4,7,8-PeCDF	0.00230	0.0599	*0.0129*	3.17E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Phenanthrene	44.0	19,000	895	2.08E+03	27-170	100	REGION III BTAG	**190**	Y
Pyrene	39.0	27,000	1,350	3.11E+03	38-620	100	REGION III BTAG	**270**	Y
2,3,7,8-TCDD	0.000200	0.00270	*0.000903*	1.96E-03	ND	10	REGION III BTAG	<0.1	N
2,3,7,8-TCDF	0.00520	0.126	*0.0321*	7.48E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Toluene	1.30	3.40	1.74	2.42E+00	ND	100	REGION III BTAG	<0.1	N
Total HpCDDs	0.0771	0.879	0.350	6.62E-01	0.13-0.14	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total HpCDFs	0.0234	0.840	*0.193*	5.16E-01	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total HxCDDs	0.0221	0.235	*0.0886*	1.82E-01	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total HxCDFs	0.03010	0.677	0.254	5.17E-01	0.12	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total PeCDDs	0.00150	0.0646	*0.0212*	5.56E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total PeCDFs	0.0383	0.783	0.259	5.28E-01	0.29	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total TCDDs	0.00350	0.0624	*0.0251*	5.29E-02	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
Total TCDFs	0.0281	0.627	*0.192*	4.29E-01	ND	10	REGION III BTAG, 2,3,7,8-TCDD	<0.1	N
1,2,4-Trichlorobenzene n,n-bis(2,4,6-Trichlorophenyl)urea	98.0 NA	1,400 30,000	224 11,300	3.15E+02 2.60E+04	ND	<100 NSL	REGION III BTAG, trichlorobenzene	**14**	Y

Table 8

Occurrence, Distribution, and Selection of Chemicals of Potential Concern (Continued)

(1) Minimum/maximum detected concentration above the sample quantitation limit (SQL).
(2) Minimum variance unbiased estimate (MVUE) mean for lognormally distributed data indicated in italics.
(3) 95% Upper Confidence Limit (UCL).
(4) Screening toxicity value source is from the U.S. Environmental Protection Agency (USEPA) Region III Biological Technical Advisory Group (BTAG) Screening Levels, Draft Document (USEPA, 1995).
(5) Hazard quotient (HQ) is defined as Maximum Concentration/Screening Toxicity Value. Values greater than or equal to 1.0 are indicated in bold type.
NA = Not applicable. ND = Not detected.
NSL = No screening level available.

Table 9

Chemicals of Potential Concern Assessed for Ecological Receptors

Habitat Type	Assessment Endpoint	Chemicals of Potential Concern (COC)
Forest	Vegetation- survival, diversity	Cadmium, copper, lead, silver
	Soil invertebrates – survival, reproduction	Copper, lead, mercury
	Terrestrial wildlife	
	Herbivorous birds – survival, reproduction	Not assessed
	Herbivorous mammals – survival, reproduction	None
	Invertebrate-eating mammals – survival, reproduction	Aroclor 1260, lead
	Vertebrate-eating mammals – survival, reproduction	None
	Invertebrate-eating birds – survival, reproduction	Aroclor 1260, chromium, lead , zinc, DDTr
	Vertebrate-eating birds – survival, reproduction	DDTr
	Amphibians – survival, reproduction	Not assessed

Table 10

Ecological Exposure Pathways of Concern

Exposure Medium	Sensitive Environment Flag (Y or N)	Receptor	Endangered/ Threatened Special Flag (Y or N)	Exposure Routes	Assessment Endpoints	Measurement Endpoints
Soil	N	Terrestrial plants	N	uptake of chemicals via root systems	toxicity of soil to rye grass	survival, diversity, growth
	N	Soil invertebrates	N	dermal contact, ingestion	toxicity of soil to *Eisenia foetida*	survival, growth, reproduction
	N	Vermivorous mammals	N	direct contact, ingestion	toxicity of soil to short-tailed shrew	survival, growth, reproduction
	N	Vermivorous birds	N	direct contact, ingestion	toxicity of soil to American robin	survival, growth, reproduction
	N	Amphibians and reptiles	N	direct contact, ingestion	no specific receptor	survival, reproduction

Table 11

Remedial Goals – Salvage Yard Soil Area (mg/kg)
G-Street Salvage Yard

Medium/COC	COC Type (c/n/e)	Receptor Risk-Based Remedial Goals					
		Site Worker	Excavation Worker	Trespasser	Ecological-Robin/Shrew	Background SL	RG-Industrial Use
Soil							
Benzo(a)anthracene	c	7.13	—	—	—	—	7.13
Benzo(a)pyrene	c	0.71	4.08	8.75	—	—	0.71
Benzo(b)fluoranthene	c	7.13	—	—	—	—	7.13
4,4'-DDT	c/n	65.9	—	—	—	NA	65.9
DDTr	c/n/e	6.59	—	—	0.372	—	0.372
Dibenzo(a,h)anthracene	c	0.71	—	—	—	—	0.71
Aroclor 1254	c/n	1.45	1.97	5.89	—	—	1.45
Aroclor 1260	c	1.45	13.8	19.7	—	—	1.45
PCBs	e	—	—	—	3.64	—	3.64
Total Dioxin TEQ	c	0.000025	0.00019	0.00033	—	—	0.000025
Antimony	n	217	19.5	431	—	—	19.5
Arsenic	c/n	2.43	19	—	—	5.6	5.6
Cadmium	c/n	163	68.7	354	—	1.4	68.7
Chromium	c/n	343	189	882	—	40.6	189
Copper	n	33,200	4,160	—	—	20.24	4,160
Iron	n	163,000	29,300	—	—	23,440	29,300
Lead	n/e	800	800	800	1,604	60.8	800
Manganese	n	—	1,990	—	—	868	1,990
Thallium	n	—	4.2	—	—	—	4.2

c - carcinogenic
n - non-carcinogenic
e - ecological

SL - screening level
NA - not applicable
TEQ = toxicity equivalence

Source: Shaw, 2005

Table 12

Remedial Goals – Burn Residue Disposal Area (mg/kg)
G-Street Salvage Yard

Medium/COC	COC Type (c/n/e)	Receptor Risk-Based Remedial Goals				Background SL	RG-Industrial Use
		Site Worker	Excavation Worker	Trespasser	Ecological-Robin/Shrew		
Surface Soil							
DDTr	e	—	—	—	0.372	—	0.372
PCBs	c/e	—	—	—	3.64	—	3.64
Arsenic	c/n	26.8	15.3	—	—	5.6	15.3
Copper	n	—	2,080	—	—	20.24	2,080
Lead	e	—	—	—	1,604	60.8	1,604

c - carcinogenic
n - non-carcinogenic
e - ecological
SL - screening level
Source: Shaw, 2005

Table 13

Comparative Analysis of Alternatives, Salvage Yard Soil Area

Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Low-Permeability Cover	Alternative 4 RCRA Cap	Alternative 5 Soil Excavation and Off-Site Disposal
OVERALL PROTECTIVENESS					
Human Health Protection					
Direct Contact/ Soil Ingestion	No reduction in risk	Will keep human receptors from entering site	Protective of human health because the low-permeability cover prevents human contact with contaminated soils.	Protective of human health because the RCRA cap prevents human contact with contaminated soils.	Surface soils with contaminant concentrations above RGs are removed and LUCs prevent future residential land use and restrict soil disturbance below 2 ft, thus protecting human health.
Environmental Protection					
Environmental Protection	Allows continued contamination of soil	No change for ecological receptors	Protective of the environment because soils with contaminant concentrations above RGs are covered, not allowing environmental receptors to come into contact with contaminated soils or migration of contaminants from the site.	Protective of the environment because soils with contaminant concentrations above RGs are covered, not allowing environmental receptors to come into contact with contaminated soils or migration of contaminants from the site.	Surface soils with contaminant concentrations above RGs are removed, thus protecting environmental receptors.
COMPLIANCE WITH ARARS					
Chemical-Specific ARARs (None – Remedial Goals)	N/A	Does not meet RGs in soil, though human contact with soil is prevented.	Contact with soil contaminated above RGs is prevented by the installation of the cover, preventing human and ecological receptor exposures to contaminants at levels that exceed the acceptable risk.	Contact with soil contaminated above RGs is prevented by the installation of the cap, preventing human and ecological receptor exposures to contaminants at levels that exceed the acceptable risk.	Achieves accepted risk levels by removing soils with contaminant concentrations above RGs.
Location-Specific ARARs	N/A	Meets location-specific ARARs	Meets location-specific ARARs.	Meets location-specific ARARs.	Meets location-specific ARARs.
Action-Specific ARARs	N/A	Not applicable	Cover prevents erosion of contaminants from the site.	Cap prevents erosion of contaminants from the site.	Removal of contaminant concentrations above RGs

Table 13

Comparative Analysis of Alternatives, Salvage Yard Soil Area (Continued)

Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Low-Permeability Cover	Alternative 4 RCRA Cap	Alternative 5 Soil Excavation and Off-Site Disposal
			Waste handling ARARs would be met through proper project planning and implementation.	Cap meets RCRA ARARs. Waste handling ARARs would be met through proper project planning and implementation.	precludes migration of contaminants from the site. Waste handling ARARs would be met through proper project planning and implementation.
LONG-TERM EFFECTIVENESS AND PERMANENCE					
Long-term effectiveness and permanence	Source has not been addressed. Existing risk will remain.	Partially effective because institutional controls only protect human health and not the environment.	Effective, but not permanent because cover will require continued maintenance.	Effective, but not permanent because cover will require continued maintenance.	Effective and permanent because contaminated soils with concentrations exceeding RGs would be removed.
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT					
Treatment process used	None	None	None	None	None
Amount destroyed or treated	None	None	None	None	None
Reduction of toxicity, mobility, or volume	None	None	None	None	None
Irreversible treatment	None	None	None	None	None
Type and quantity of residuals remaining after treatment	Contaminated soil remains.	Contaminated soil remains.	Contaminated soil remains.	Contaminated soil remains.	Contaminated soil is removed to an off-site location.
SHORT-TERM EFFECTIVENESS					
Community Protection, worker protection, environmental impacts, time until action is complete	Continued risk to community through no action.	Alternative can be implemented safely and would be effective in 12 months (for implementation of LUCs).	Alternative can be implemented safely and would be effective in 24 months (12 months for construction; 12 months for implementation of LUCs).	Alternative can be implemented safely and would be effective in 24 months (12 months for construction; 12 months for implementation of LUCs).	Alternative can be implemented safely and would be effective in 24 months (12 months for construction; 12 months for implementation of LUCs).
IMPLEMENTABILITY					
Technically practical, practical administratively, services and materials are available.	No construction or operation.	Easily implemented, no construction or operation.	More challenging, but can still be implemented.	More challenging, but can still be implemented.	More challenging, but can still be implemented.

Table 13

Comparative Analysis of Alternatives, Salvage Yard Soil Area (Continued)

Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls	Alternative 3 Low-Permeability Cover	Alternative 4 RCRA Cap	Alternative 5 Soil Excavation and Off-Site Disposal
COST (Rounded to Nearest $1,000)					
Capital Cost	$0	$84,000	$903,000	$974,000	$2,448,000
Annual O&M Cost	$3,000	$21,000	$18,000	$18,000	$6,000
Present Worth Cost	$46,000	$412,000	$1,181,000	$1,252,000	$2,544,000
State Acceptance					
State Acceptance	Not acceptable. Not protective of human health and the environment.	Not acceptable. Not protective of the environment.	Acceptable	Acceptable	Acceptable
Community Acceptance					
Community Acceptance	Not acceptable	Not Acceptable	Acceptable	Acceptable	Acceptable

Table 14

Comparative Analysis of Alternatives – BRDA

Criteria	Alternative 1 No Action	Alternative 2 Improve Existing Cover	Alternative 3 Soil Excavation and Off-Site Disposal
OVERALL PROTECTIVENESS			
Human Health Protection			
Direct Contact/Soil Ingestion	No reduction in risk; allows continued contamination of soil.	Protective of human health because the improved cover prevents human contact with contaminated soils .	All soils with contaminant concentrations above RGs in the burial area are removed, thus protecting human health. Surface soils outside of the burial area with contaminant concentrations above RGs are removed and LUCs prevent future residential land use and restrict soil disturbance below 2 ft, thus protecting human health.
Environmental Protection			
	No reduction in risk; allows continued contamination of soil.	Protective of the environment because soils with contaminant concentrations above RGs are covered, not allowing environmental receptors to come into contact with contaminated soils or migration of contaminants from the site.	All soils with contaminant concentrations above RGs in the burial area are removed. Surface soils outside of the burial area with contaminant concentrations above RGs are removed, thus protecting environmental receptors.
COMPLIANCE WITH ARARS			
Chemical-Specific ARARs (None – Remedial Goals)	Soils will always exceed RGs	Contaminated soil will be covered.	Removal of soils with contaminant concentrations above RGs.
Location-Specific ARARs	None	Meets location-specific ARARs	Meets location-specific ARARs
Action-Specific ARARs	None	May not meet action-specific ARARs if the area is considered a landfill because materials within the BRDA are potentially hazardous and the proposed cover does not meet RCRA standards.	Removal of contaminant concentrations above RGs within the burial area precludes migration of contaminants from the site. Waste handling ARARs will be met through proper project planning and implementation. Achieves accepted risk levels by removing soils with contaminant concentrations above RGs outside of the burial area.
LONG-TERM EFFECTIVENESS AND PERMANENCE			
Long-term effectiveness and permanence	Source has not been addressed. Existing risk will remain.	Effective, but not permanent.	Effective and permanent because contaminated soils with concentrations exceeding RGs would be removed.
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT			
Treatment process used	None	None	None
Amount destroyed or treated	None	None	None
Reduction of toxicity,	None	None	None

Table 14

Comparative Analysis of Alternatives – BRDA (Continued)

Criteria	Alternative 1 No Action	Alternative 2 Improve Existing Cover	Alternative 3 Soil Excavation and Off-Site Disposal
mobility, or volume			
Irreversible treatment	None	None	None
Type and quantity of residuals remaining after treatment	Contaminated soil remains.	Contaminated soil remains.	Contaminated soil is removed to an off-site location in the burial area. Contaminated soil may remain at depths below 2 feet below ground surface in some areas outside of the burial area.
SHORT-TERM EFFECTIVENESS			
Community Protection, worker protection, environmental impacts, time until action is complete	Continued risk to community through no action.	Alternative can be implemented safely and would be effective in 18 months (9 months construction; 9 months to implement LUCs).	Alternative meets criterion because safety measures would be implemented to address UXO/CWM hazards that potentially could be encountered. Alternative can be implemented safely and would be effective in 30 months (15 months construction; 15 months to implement LUCs).
IMPLEMENTABILITY			
Technically practical, practical administratively, services and materials are available.	No construction or operation	Easily implemented.	More challenging, but can still be implemented.
COST (Rounded to Nearest $1,000)			
Capital Cost	$0	$464,000	$5,223,000
Annual O&M Cost	$3,000	$17,000	$6,000
Present Worth Cost	$46,000	$729,000	$5,319,000
State Acceptance			
State Acceptance	Not acceptable. Not protective of human health and the environment.	Acceptable short-term. Protective of human health and the environment.	Acceptable.
Community Acceptance			
Community Acceptance	Not acceptable	Acceptable short-term. Protective of human health and the environment.	Acceptable.

Table 15

Salvage Yard Soil Area and BRDA: Compliance with ARARs

Authority	Medium	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
Chemical-Specific ARARs					
N/A	N/A	N/A	N/A	N/A	N/A
Location-Specific ARARs					
Federal	Soil	Endangered Species Act, 16 USC 1531 Migratory Bird Treaty Act: 16 USC 703 et seq Bald and Golden Eagle Protection Act: 16 USC 668 et seq	Potentially applicable	Requires action to conserve threatened or endangered species and their habitat.	Potentially applicable if endangered or threatened species are identified at the G-Street Salvage Yard. None have been identified to date. It is not anticipated that any endangered or threatened species will be identified; however, bald eagles are known to nest on APG-EA.
State of Maryland	Soil	Maryland Threatened and Endangered Species Regulations: COMAR 08.03.08; Maryland Environmental Policy Act of 1973; Maryland Endangered Species Act of 1971; Maryland non-game and Endangered Species Conservation Action of 1975.	Potentially applicable	Requires action to conserve threatened or endangered species and their habitat.	Potentially applicable if endangered or threatened species are identified at the G-Street Salvage Yard. None have been identified to date. It is not anticipated that any endangered or threatened species will be identified; however, bald eagles are known to nest on APG-EA.
Action-Specific ARARs					
State of Maryland	Soil	COMAR 26.13.03.02	Applicable	Specific requirements for identifying hazardous wastes. Establishes analytical requirements for testing and evaluating solid, hazardous, and water wastes.	Sampling and analysis will be conducted in accordance with State requirements.

Table 15

Salvage Yard Soil Area and BRDA: Compliance with ARARs (Continued)

Authority	Medium	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
Federal	Soil	40 CFR 261.2(a)(2)(iv) and 266.200-266.206, Subpart M [reference 40 CFR 260-270]; DoD policy to implement the USEPA Military Munitions Rule (MMR)	Applicable	Regulations that identify when military munitions become a solid waste and if hazardous. DoD policy to implement the MMR outlines DoD procedures for the identification of and response to munitions residues.	Regulations will be followed in the handling of MMR.
State of Maryland	Soil	COMAR 26.13.05.09	Applicable	Provides requirements for the management of hazardous waste in containers.	Relevant and appropriate to the on-site storage of media in containers. All regulations will be followed.
State of Maryland	Soil	RCRA Treatment Storage and Disposal of Hazardous Waste COMAR 26.13.05.12	Applicable	Provides requirements for handling waste at the following facility types: ➢ Temporary units (TUs) ➢ Staging piles ➢ Hazardous waste munitions and explosive storage.	Applicable to the storage and treatment of soils contaminated with munitions residues and hazardous wastes from remediation activities. All regulations will be followed.
Federal	Soil	RCRA Land Disposal Restrictions: 40 CFR 268 Subparts A through E	Potentially applicable	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise restricted waste may continue to be land disposed.	Potentially applicable if soils and media containing munitions residues are disposed off-site in a landfill as hazardous waste. Wastes will be carefully screened to ensure that no munitions are included in off-site wastes.
Federal	Soil	RCRA Hazardous Waste Generation 40 CFR 262 Subpart C 262.34 Accumulation Time	Applicable	Accumulation time.	Wastes will be tracked to ensure that none are stored on-site in exceedance of time allowed.

Table 15

Salvage Yard Soil Area and BRDA: Compliance with ARARs (Continued)

Authority	Medium	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
Federal/State of Maryland	Soil	40 CFR 50.7 COMAR 26.11.06	Applicable	Requires reasonable precautions be implemented to prevent particulate matter from fugitive dust and emissions from becoming airborne. Prohibits the discharge of visible dust emissions beyond the lot line of the property.	Applicable to clearing, grubbing, and excavation activities. Engineering controls on dust emissions will be emplaced to ensure that there are no visible dust emissions beyond the property line.
Federal	Soil	40 CFR 50.12	Applicable	Establishes national primary and secondary ambient air quality standards for lead and its compounds.	Potentially applicable to fugitive dust emissions during clearing, grubbing, excavation. Engineering controls on dust emissions will be emplaced to ensure that there are no visible dust emissions beyond the property line.
State of Maryland	Soil	COMAR 26.11.04	Applicable	Air quality standards for ambient air.	Potentially applicable to fugitive dust emissions during clearing, grubbing, excavation. Engineering controls on dust emissions will be emplaced to ensure that there are no visible dust emissions beyond the property line.
State of Maryland	Soil	Air Quality Fugitive Dust Emissions COMAR 26.11.04	Applicable	Specifies acceptable emission levels	Potentially applicable to fugitive dust emissions during clearing, grubbing, excavation. Engineering controls on dust emissions will be emplaced to ensure that there are no visible dust emissions beyond the property line.
State of Maryland	Soil	Erosion and Sediment Control COMAR 26.17.01	Applicable	Specifies erosion and sediment control guidelines	Applicable to excavation activities. An approved erosion and sediment control plan will be followed during the remedial action activities.

Table 15

Salvage Yard Soil Area and BRDA: Compliance with ARARs (Continued)

Authority	Medium	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
State of Maryland	Soil	Stormwater Management COMAR 26.17.02	Applicable	Specifies stormwater management guidelines	Potentially applicable during excavation activities. Stormwater management will be conducted during the remedial action activities.

Table 16

Applicable Guidance

Authority	Medium	Requirement	Status	Synopsis of Requirement	Action to be Taken to Attain Requirement
Federal Guidance	Soil	USEPA Industrial Screening Level of 800 ppm for lead	TBC	800 ppm lead in industrial soil	The Selected Remedy will comply with this through removal of soils with lead concentrations greater than 800 ppm.
Army/DoD	Soil	DA PAM 50-6 DA PAM 385-61 DA PA 40-137	TBC	Defines procedures for emergency decontamination of site workers.	Will be followed if UXOs are discovered during excavation and/or clearing activities at the site. All Army regulations will be followed.
Army/DoD	Soil	DOD 6055.9-STD	TBC	Requires specialized personnel in detection, removal, and disposal of ordnance and explosives (OE); stipulates required safety precautions and procedures for detonation/ disposal; establishes depth of remediation based on land use.	Will be followed if UXOs are discovered during excavation and/or clearing activities at the site. All Army regulations will be followed.
Army/DoD	Soil	USAT CESP 385-02 AR 385-64 DA PAM 385-64	TBC	UXO safety guidelines for explosives and ammunition.	Will be followed if UXOs are discovered during excavation and/or clearing activities at the site. All Army regulations will be followed.
Army/DoD	Soil	TM-9-1375-213-12	TBC	Defines the minimum safe distance between emitters of electromagnetic radiation in the radio frequency range and UXO clearance/ demolition activities.	Will be followed if UXOs are discovered during excavation and/or clearing activities at the site.

Table 17

Salvage Yard Soil Area Cost Estimate Summary for the Selected Remedy: Alternative 5 Soil Excavation and Off-Site Disposal

ITEM	UNITS	NUMBER	UNIT COST	TOTAL
CAPITAL COSTS				
Work Plans/Reporting				
H&S Plan	Plan	1	$10,000.00	$10,000
QCP	Plan	1	$10,000.00	$10,000
Work Plan	Plan	1	$30,000.00	$30,000
Long-term Monitoring Plan	Report	1	$10,000.00	$10,000
RAC Report	Report	1	$30,000.00	$30,000
Deed Restrictions	Lump Sum	1	$10,000.00	$10,000
Contamination Delineation				
Project Chemist	Hour	16	$79.00	$1,264
Field Technician (2)	Hour	80	$30.00	$2,400
EOD Technician - avoidance support	Hour	30	$45.00	$1,350
Sample Analysis	Sample	48	$416.00	$19,968
Site Set-Up				
Decontamination Pad Construction	Site	1	$5,000.00	$5,000
Rental of 6,500-Gallon Storage Tank	Month	3	$448.00	$1,344
Rental of Office/Storage Trailer & Porta Pots	Month	3	$528.32	$1,585
UXO Surface Sweep of Work/Support Areas	Acre	5	$1,000.00	$5,000
Clearing and Grubbing	Acre	3.5	$2,952.00	$10,332
Safety/QC Oversight	Hour	585	$39.00	$22,815
Surface Soil Excavation				
UXO Clearance in Excavation Areas	Lump Sum	1	$45,000.00	$45,000
Field Supervisor	Hour	585	$46.00	$26,910
Field Technician (2)	Hour	1080	$30.00	$32,400
Equipment Operators (2)	Hour	1080	$42.00	$45,360
Project Chemist	Hour	60	$79.00	$4,740
D6 Bulldozer	Week	12	$1,910.00	$22,920
3 CY Trackhoe	Week	12	$2,379.00	$28,548
Water Truck w/operator	Week	6	$773.00	$4,638
Confirmation Sample Analysis	Sample	42	$416.00	$17,472
Waste Characterization, Transportation, and Disposal				
Analysis	Sample	17	$837.50	$14,238
Non-Hazardous Waste T&D	Ton	8,241	$160.00	$1,318,560
Site Restoration				
Fill Material	CY	6,339	$14.00	$88,746
Seeding, Vegetative Cover	Acre	4	$4,939.20	$19,757
	SUBTOTAL			**$1,840,346**
	PROJECT MANAGEMENT @ 8%			$147,228
	CONTINGENCY @ 25%			$460,087
TOTAL CAPITAL COST				**$2,447,661**
ANNUAL O&M COSTS				
Administrative Actions				
5-Year Reviews	Report	1	$3,000.00	$3,000
Public Education	Lump Sum	1	$1,000.00	$1,000
Institutional Controls/Oversight	Lump Sum	1	$1,000.00	$1,000
	SUBTOTAL			**$5,000**
	CONTINGENCY @ 25%			$1,250
	TOTAL O&M COSTS			**$6,250**
PRESENT WORTH (30 YEARS AT 5%)				**$2,543,738**

Table 18

BRDA Cost Estimate Summary for the Selected Remedy: Alternative 3 Soil Excavation and Off-Site Disposal

ITEM	UNITS	NUMBER	UNIT COST	TOTAL
CAPITAL COSTS				
Work Plans/Reporting				
H&S Plan	Plan	1	$15,000.00	$15,000
QCP	Plan	1	$15,000.00	$15,000
Work Plan	Plan	1	$50,000.00	$50,000
CWM Safety Submittal	Plan	1	$40,000.00	$40,000
RAC Report	Report	1	$35,000.00	$35,000
Contamination Delineation				
Project Chemist	Hour	16	$79.00	$1,264
Field Technician (2)	Hour	60	$38.00	$2,280
EOD Technician - avoidance support	Hour	30	$45.00	$1,350
Sample Analysis	Sample	15	$606.00	$9,090
Site Set-Up				
Decontamination Pad Construction	Site	1	$5,000.00	$5,000
Rental of 6,500-Gallon Storage Tank	Month	8	$448.00	$3,584
Office/Storage Trailer Setup (electric, phone, etc)	lump sum	1	$4,000.00	$4,000
Rental of Office/Storage Trailer & Porta Pots	Month	9	$528.32	$4,755
UXO Surface Sweep of Work/Support Areas	Acre	3	$1,500.00	$4,500
Clearing and Grubbing	Acre	2	$2,952.00	$5,904
Cover and Surface Soil Excavation				
UXO Clearance in Excavation Area	lump sum	1	$15,000.00	$15,000
Field Supervisor	Hour	180	$46.00	$8,280
Field Technician (2)	Hour	360	$30.00	$10,800
Equipment Operators (2)	Hour	360	$42.00	$15,120
Project Chemist	Hour	24	$79.00	$1,896
Low Ground Pressure Bulldozer	Week	4	$1,910.00	$7,640
3 CY Trackhoe	Week	4	$2,379.00	$9,516
Water Truck w/operator	Week	1	$773.00	$773
Confirmation Sampling	Sample	20	$269.00	$5,380
VCS/ CWM PPE/Air Monitoring				
Rental of VCS	lump sum	1	$359,520.00	$359,520
Setup/Teardown of VCS	lump sum	1	$176,815.00	$176,815
ECBC Site Prep/VCS/Filter Unit	hour	600	$81.00	$48,600
ECBC Cascade Air System Usage/Recharge Fee	lump sum	1	$1,600.00	$1,600
ECBC Cascade Air System Cooling Unit	lump sum	1	$1,800.00	$1,800
ECBC Level A Suits Test/SCBA	lump sum	1	$3,270.00	$3,270
ECBC Level A Suits Cleaning/Test/Repair	hour	600	$81.00	$48,600
ECBC Pre-op Support	hour	140	$81.00	$11,340
ECBC "Hot Operations" Monitoring Support	hour	4,500	$81.00	$364,500
ECBC Cascade Air System Operator	hour	600	$81.00	$48,600
ECBC Sample Analysis	Sample	100	$240.00	$24,000
ECBC Expendables/Supplies	lump sum	1	$28,000.00	$28,000
ECBC Site Teardown	hour	300	$81.00	$24,300
ECBC Fee	lump sum	1	$109,000.00	$109,000

Table 18

BRDA Cost Estimate Summary for the Selected Remedy: Alternative 3 Soil Excavation and Off-Site Disposal (Continued)

ITEM	UNITS	NUMBER	UNIT COST	TOTAL
BRDA Excavation				
EOD Team	Day	95	$6,002.00	$570,190
Site Engineer	hour	1350	$90.00	$121,500
Field Supervisor	hour	1215	$70.00	$85,050
Field Office Manager	hour	1350	$50.00	$67,500
Video Monitoring System	lump sum	1	$15,000.00	$15,000
Miscellaneous Engineering Controls	lump sum	1	$25,000.00	$25,000
Vacuum Rental	lump sum	1	$43,000.00	$43,000
Roll-off Rental	lump sum	1	$6,300.00	$6,300
Confirmational Sampling	Sample	36	$1,338.50	$48,186
Waste Characterization, Transportation, and Disposal				
Analysis	Sample	9	$837.50	$7,538
Non-Hazardous Waste T&D	Tons	693	$160.00	$110,880
Hazardous Waste T&D	Tons	3,640	$320.00	$1,164,800
Site Restoration				
Borrow Material	CY	3,333	$14.00	$46,662
Seeding, Vegetative Cover	Acre	2	$4,939.20	$9,878
	SUBTOTAL			**$3,812,561**
	PROJECT MANAGEMENT @ 12%			$457,507
	CONTINGENCY @ 25%			$953,140
TOTAL CAPITAL COST				**$5,223,208**
ANNUAL O&M COSTS				
Administrative Actions				
5-Year Reviews	Report	1	$3,000.00	$3,000
Public Education	Lump Sum	1	$1,000.00	$1,000
Institutional Controls/Oversight	Lump Sum	1	$1,000.00	$1,000
	SUBTOTAL			**$5,000**
	CONTINGENCY @ 25%			$1,250
	TOTAL O&M COSTS			**$6,250**
PRESENT WORTH (30 YEARS AT 5%)				**$5,319,286**

Table 19

Expected Outcomes for the Selected Remedies

	Salvage Yard Soil Area Commercial/Industrial Use	**BRDA Commercial/Industrial Use**
Site Scenario	Exposure controlled through removal of COCs with concentrations greater than RGs to a depth of 2 feet bgs	Exposure controlled through removal of COCs with concentrations greater than RGs to a depth of 2 feet bgs and removal of MEC and burn residue to full depth (estimated at 8 feet bgs) in the pit area
Expected Outcomes	➢ Land may be used for commercial and/or industrial purposes 24 months after initiation of Selected Remedy (12 months construction, 12 months to implement LUCs).	➢ Land may be used for commercial and/or industrial purposes 30 months after initiation of Selected Remedy (15 months construction, 15 months to implement LUCs).
	➢ Removal of contaminated soil and off-site disposal will protect human health and the environment.	➢ Removal of contaminated soil and off-site disposal will protect human health and the environment.
	➢ Remedial goals are presented in **Table 11**, p. 94.	➢ Remedial goals are presented in **Table 12**, p. 95**.**

Table 20

Cleanup Levels and Calculated Commercial/Industrial Risk at Cleanup for the Chemicals of Concern at the Salvage Yard Soil Area (mg/kg)

Media: Soil
Site Area: Salvage Yard Soil Area
Available Use: Commercial/Industrial
Controls to Ensure Restricted Use: LUCs

COC	Cleanup Level	Basis for Cleanup Level	Risk at Cleanup Level
Benzo(a)anthracene	7.13	Risk Assessment	Cancer Risk = 1×10^{-6}
Benzo(a)pyrene	0.71	Risk Assessment	Cancer Risk = 1×10^{-6}
Benzo(b)fluoranthene	7.13	Risk Assessment	Cancer Risk = 1×10^{-6}
4,4-DDT	65.9	Risk Assessment	Cancer Risk = 1×10^{-6}
DDTr	0.372	Risk Assessment	Based on background
Dibenzo(a,h)anthracene	0.71	Risk Assessment	Cancer Risk = 1×10^{-6}
Heptachlor	--	Risk Assessment	Cancer Risk = 1×10^{-6}
Heptachlor epoxide	--	Risk Assessment	Cancer Risk = 1×10^{-6}
Ideno(1,2,3-cd)pyrene	--	Risk Assessment	Cancer Risk = 1×10^{-6}
Aroclor 1254	1.45	Risk Assessment	Cancer Risk = 1×10^{-6}
Aroclor 1260	1.45	Risk Assessment	Cancer Risk = 1×10^{-6}
PCBs	3.64	Risk Assessment	Based on ecological risk
Total dioxin TEQ	0.000025	Risk Assessment	Cancer Risk = 1×10^{-6}
Aluminum	--	Risk Assessment	HI < 1
Antimony	19.5	Risk Assessment	HI < 1
Arsenic	5.6	Risk Assessment	HI < 1
Barium	--	Risk Assessment	HI < 1
Cadmium	68.7	Risk Assessment	HI < 1
Chromium	189	Risk Assessment	HI < 1
Copper	4,160	Risk Assessment	HI < 1
Iron	29,300	Risk Assessment	HI < 1
Lead	800	Risk Assessment	HI < 1
Manganese	1,990	Risk Assessment	HI < 1
Mercury	--	Risk Assessment	HI < 1
Silver	--	Risk Assessment	HI < 1
Thallium	4.2	Risk Assessment	HI < 1
Vanadium	--	Risk Assessment	HI < 1
Zinc	--	Risk Assessment	HI < 1

Table 21

Cleanup Levels and Calculated Commercial/Industrial Risk at Cleanup for the Chemicals of Concern at the BRDA (mg/kg)

Media: Soil
Site Area: BRDA
Available Use: Commercial/Industrial
Controls to Ensure Restricted Use: **LUCs**

COC	Cleanup Level	Basis for Cleanup Level	Risk at Cleanup Level
Benzo(a)pyrene	--	Risk Assessment	Cancer Risk = 1×10^{-6}
DDTr	0.372	Risk Assessment	Based on background
Dibenzo(a,h)anthracene	--	Risk Assessment	Cancer Risk = 1×10^{-6}
PCBs	3.64	Risk Assessment	Based on ecological risk
Aluminum	--	Risk Assessment	HI < 1
Antimony	--	Risk Assessment	HI < 1
Arsenic	15.3	Risk Assessment	HI < 1
Copper	2,080	Risk Assessment	HI < 1
Lead	1,604	Risk Assessment	HI < 1
Mercury	--	Risk Assessment	HI < 1
Zinc	--	Risk Assessment	HI < 1

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PART 3: RESPONSIVENESS SUMMARY

The final component of the ROD is the Responsiveness Summary. The purpose of the Responsiveness Summary is to provide a summary of the public's comments, concerns, and questions about the two areas included in this ROD, and the Army responses to these concerns.

APG held a public meeting on 25 June 2007 to formally present the Proposed Plan and remedial actions, and to answer questions and receive comments. During the public comment period, APG also received written comments. All comments and concerns summarized below have been considered by the Army and USEPA in selecting the Remedies for the Salvage Yard Soil Area and BRDA.

This responsiveness summary is divided into the following sections:

1 Overview.

2 Background on community involvement.

3 Summary of comments received during the public comment period and the APG responses.

1 OVERVIEW

At the time of the public comment period, the Army had published the preferred alternatives for the two areas at G-Street. Excavation and off-site disposal and LUCs were proposed as the preferred alternative for both areas to reduce potential risks to human and ecological receptors and to prevent future military family housing, elementary and secondary schools, child care facilities, playgrounds, and non-military residential land use. There are uncertainties associated with the ERAs that would require additional extensive and expensive studies to make a more definitive determination of risk. To complete a streamlined response, USEPA and MDE support the Selected Remedies outlined in this ROD as necessary to adequately and cost-effectively protect human health and the environment. The community generally agrees with the selected remedies.

2 BACKGROUND ON COMMUNITY INVOLVEMENT

APG has maintained an active public involvement and information program for the IRP since the early 1990s. APG performed community relations activities for the G-Street Salvage Yard areas as follows:

- Information regarding the two areas was presented to the RAB several times over the last few years.
- The public comment period on the Proposed Plan ran from 25 June 2007 to 8 August 2007. Copies of the Proposed Plan were made available to the public through the APG Administrative Record locations at the Edgewood and Aberdeen branches of the Harford

County Library and the Miller Library at Washington College in Chestertown, Kent County.

- APG prepared a release announcing the availability of the Proposed Plan, the dates of the public comment period, and the date and time of the public meeting. APG placed newspaper advertisements announcing the public comment period and meeting in *The Aegis, The Avenue, The Cecil Whig, The East County Times*, and *The Kent County News.* See *Figure 7, p. 121* for a copy of the newspaper advertisement.

- APG prepared and published a fact sheet on the Proposed Plan including information on the public meeting. APG mailed copies of this fact sheet to more than 2,600 citizens and elected officials on its IRP mailing list. The fact sheet included a form, which citizens could use to send APG their comments.

- On 25 June 2007, APG held a public meeting at the Edgewood Senior Center in Edgewood, Maryland. Representatives of the Army, USEPA, and MDE were present at the meeting. APG representatives presented information on the Salvage Yard Soil Area and BRDA, and on the proposed remedial actions. A full transcript of the meeting is available in the Administrative Record.

3 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

Comments raised during the public comment period on the two areas are summarized below.

COMMENTS FROM THE FACT SHEET MAILER

As part of the fact sheet on the Proposed Plan, APG included a questionnaire that residents could return with their comments. APG received **9** completed forms. The alternatives preferred by individuals that returned comment forms were:

Salvage Yard Soil Area

______Alternative No. 1 – No Action
______Alternative No. 2 – Institutional Controls
______Alternative No. 3 – Low Permeability Cover
__**1**__Alternative No. 4 – Resource Conservation and Recovery Act (RCRA) Cap
__**8**__Alternative No. 5 – Soil Excavation and Off-Site Disposal

The Army selected Alternative 5, with concurrence from the USEPA and agreement from MDE. Alternative 4, preferred by one of the responding community members, was not selected because contaminants would remain on-site and the land could not be re-used. Alternatives 3 and 4 provide adequate protection for this site, but contaminants would remain on-site and the land could not be re-used.

BRDA

______Alternative No. 1 – No Action
1 Alternative No. 2 – Improve and Extend Existing Cover
8 Alternative No. 3 – Excavation and Off-Site Disposal

At the time of the public meeting, the Army preferred Alternative 3, with concurrence from the USEPA and agreement from MDE. Alternative 2, preferred by one of the responding community members, was not selected because contaminants would remain on-site and the land could not be re-used.

Written comments from the fact sheet mailers and oral comments from the public meeting are summarized below.

Comment #1: ***a) Pretend we remediate it instead of going somewhere else. What do you plan on doing with the land? Is it industrial or are you going to bring back [Commenter stopped question in mid-sentence and proceeded with b) and c) below]***

b) Will it be a dump?

c) Well what that really means is no residential?

Response #1a: This site will be cleaned up to a condition where the Army could use it for industrial purposes.

Response #1b: No. This site will be cleaned up for industrial use, such as office parks/complexes or parking lots.

Response #1c: Yes. This site will be cleaned up to allow industrial use of the area. The USEPA has indicated that when a site is cleaned up to industrial standards, residential use is prohibited. APG's remedy for the G-Street Salvage Yard will include procedures that will prohibit residential use.

Comment #2: ***So you only plan to remove everything and then bring in, not more industrial waste or anything… use it for something else. Is it feasible that you can really do that, I guess, to that level where you could stand on it?***

Response #2: Yes. The G-Street Salvage Yard would be cleaned up to industrial standards so that the area will be safe for various scenarios, such as people safely walking across parking lots or working in office buildings for 30+ years without any additional adverse impacts.

Comment #3: ***a) Is this one of the worst sites at the field or no?***

b) Has there been other places where you have done this?

c) Has it not been this bad?

Response #3a: No. APG's restoration program addresses sites to protect human health and the environment. Many former contaminated sites at APG have successfully undergone the remediation process to remove contaminants that were demonstrated to impact human health or the environment. The restoration process is an ongoing program where additional sites are being investigated to determine impacts and possible remediation.

Response #3b: Yes. Many former contaminated sites at APG have successfully undergone the remediation process to remove contaminants that were demonstrated to impact human health or the environment.

Response #3c: APG has cleaned up similar sites. Contamination that poses a risk to human health and the environment must be cleaned up, in this case, contaminated soil removal and off-site disposal. If a spill occurs during material transport, APG would receive notice, and that has never happened before. MDE has strict regulations about how material must be transported on public roads in Maryland and APG follows those regulations. In addition, only qualified contractors are hired to operate within those regulations. These qualified contractors have the knowledge to respond if there is an incident.

Comment #4: ***If I was a terrorist or something I would put a big score on that because it's already there, all you gotta do is "boom". Is that why you're trying to move it someplace where nobody knows where it is?***

Response #4: Waste is delivered to landfills according to its classification. Each landfill is permitted to accept certain materials. Model City, New York is one place this material may be shipped to. There's another landfill in Emelle, Alabama that APG has used. It all depends on what the material is and what the individual landfill may accept in accordance with their operating permit. Items like UXO are not taken off of APG. APG has several permitted units on-site to handle UXO. If chemical munitions were found, there are places at APG called Munitions Assessment and Processing System facilities or the J-Field area where these items are handled. Normally what we dispose of off-post is contaminated soil with some minor debris.

Comment #5: ***I'm going to have to pray. I'll pray for you.*****[Regarding trucking hazardous waste from MD to NY]**

Response #5: APG appreciates your concern. When these materials are removed and excavated, they have to go to a location that is permitted to accept them. In Maryland, there are no facilities that can accept these materials, if in fact these materials are declared a hazardous waste. So those materials would have to go to facility that is permitted by the State regulatory agency that has all the controls in place. A lot of these materials that are solids will be treated to meet certain levels before they go to the landfill. The landfills or the disposal sites have robust permit requirements so that risks at those facilities are minimal or non-existent. With respect to your concern about materials going down the highway, our program certifies vehicles and companies to haul hazardous wastes if their materials are classified as hazardous wastes. Most of the risk comes on highway transportation from raw materials and goods. Unfortunately, fuel gasoline presents the greatest risk for transportation. But hazardous waste going down the highway has very little risk. Many controls are in place for hazardous wastes because they have little value. You cannot get a return from hazardous wastes. So Congress in 1976 said, "We are going to put a lot of control on wastes to make sure that they end up from cradle to grave in a safe repository." It's not a 100% guarantee that there will not be an incident with a hazardous waste vehicle, but it is very rare that something happens. And there are emergency response measures in place, with communication and safety procedures that must be followed, should an incident occur.

Comment #6: ***Is the clean soil to put back checked?***

Response #6: Yes. In fact, APG requires the contractor for the Army to provide a profile for the soil they are planning to use as backfill. APG checks the standards to verify that the soil will not be an issue for future generations.

Comment #7: ***[Chemical bomblets] can be detonated?***

Response #7: While the Munitions Assessment and Processing System facilities provide a means of disposal, the most effective way to dispose of munitions is detonation down at the J-Field area. When chemical bomblets are surrounded by enough explosives, they are literally destroyed. Like thermal destruction, everything burns up and the remaining chemicals are non-toxic. Precautions will be taken at the site should these bomblets be found.

Comment #8: ***a) Do you have [guard] vehicles around the [transport] vehicles?***

b) I'm a terrorist. I'm going to head down to the Salvage Yard and get this type and… That's what I'm going to do.

Response #8a: These transport vehicles are not what would generally be considered a terrorist target. There are chemical plants that have in-use chemicals that would be of significantly more interest to a terrorist than a truck filled with contaminated soil.

Response #8b: Again, these transport vehicles are not what would generally be considered a terrorist target.

Comment #9: ***I feel the [Salvage] Yard soil and disposal burn residue should be controlled to the utmost. The environment and people must be protected until better remedy of clean up can be met. You know where and what you have now- I am strongly against excavation and disposal of contaminated soils, materials etc. to other places. It only spreads it to other areas and can cause more problems to other people.***

Response #9: It appears the means of remediation for this site are misunderstood. APG takes appropriate measures to ensure that all contaminated waste are well contained and prevented from causing a risk to human health and the environment. APG plans to safely transport the contaminated soil to a designated landfill which has been authorized to accept the specified chemicals. APG by no means disposes of waste in a manner that would leave a problem for others to rectify. Please see Responses #4 and #5 for more details.

The following is a summary of the public meeting, held on 25 June 2007 at the Edgewood Senior Center:

Attendees:

Community Members: Don Martin, Verna White
Maryland Department of the Environment (MDE): Heather Njo, Butch Dye
Restoration Advisory Board (RAB) Member: Chris Grochowski
US Army Aberdeen Proving Ground (USAPG) Directorate of Safety, Health and the Environment (DSHE) Environmental Conservation and Restoration Division (ECRD): John Wrobel, Ken Stachiw
USAPG Public Affairs Office (PAO): George Mercer
US Army Environmental Center (AEC): Rich Isaac, Margaret Howard
US Environmental Protection Agency (USEPA) Region III: Frank Vavra
Weston Solutions, Inc.: Joe Gross, Mike Ervine
General Physics Corporation: Sarah Coffey
Myers Engineering: Lisa Myers

** Prior to the start of the meeting, an informal information poster session was held to provide an opportunity for community members to ask questions about the sites included in the G-Street Salvage Yard Proposed Plan. There were questions and discussions, but John Wrobel asked to bring up those same questions during the presentation. The entire presentation was recorded and a transcript is available on CD-ROM in the Administrative Record.*

1.0 Welcome and Introductions

Mr. George Mercer (APG PAO) welcomed all attendees to the Proposed Plan (PP) briefing for the G-Street Salvage Yard. In particular, he introduced Mr. Butch Dye (MDE), Ms Heather Njo (MDE), Mr. Frank Vavra (USEPA), Ms. Chris Grochowski (RAB), Mr. Rich Isaac (AEC), Ms. Margaret Howard (AEC), and Mr. Ken Stachiw (Chief, DSHE ECRD). He then turned the meeting over to Mr. John Wrobel (DSHE ECRD).

2.0 Salvage Yard Disposal Area and Burn Residue Disposal Area

Mr. Wrobel gave a general overview of the CERCLA process before proceeding into details about the G-Street Salvage Yard PP. He described the subdivision of the area into the Salvage Yard Soil Area and the BRDA) and gave a brief history of each. Mr. Wrobel then described the primary COCs at both areas and described the use of a geophysical survey to estimate the metallic hits in the BRDA.

Mr. Wrobel proceeded to describe the rationale for choosing the proposed alternative for each area (soil excavation and off-site disposal). Finally, he described the procedures that would be taken after the response action was completed to confirm the remediation of the COCs.

3.0 General Questions and Discussion

Ms. Verna White (community member) questioned how the remediated land would be used. Mr. Wrobel replied that the land would be used for industrial purposes, such as office complexes or parking lots. Mr. Stachiw clarified that the term industrial implies that adults could work there but children should not be raised there.

Ms. White asked if it was feasible to excavate the soil from the areas to a point where it was safe for industrial use. Mr. Wrobel replied that he had full confidence that it was feasible.

Ms. White expressed her concerns regarding the transportation of this soil. Mr. Wrobel replied that they would address her concerns in the Record of Decision (ROD) and invited her, after reviewing the guidelines that they follow, to make any suggestions she feels necessary.

Ms. White asked if the G-Street site was one of the worst sites at Aberdeen Proving Ground (APG). Mr. Wrobel replied that it was one of the priority sites that they wanted to address. Ms. White then asked if there were other sites where they pursued this course of action (soil excavation), and had the situation not been this severe before. Mr. Wrobel replied that they have removed contaminated soil from APG at other sites. As for the severity, Mr. Wrobel explained that all APG follows all precautions laid out by MDE for transportation of contaminants.

Ms. White commented that the contaminated soil may be a tempting target for terrorists and asked if that was the reason the military was moving the soil to an unspecified location. Mr. Wrobel explained that the locations of the disposal sites were public information and that any facility with proper permitting could take the contaminants. Mr. Stachiw added that items such as unexploded ordnance and chemical munitions do not leave APG and are treated at facilities at APG. Contaminated soil, however, is disposable off-base at a permitted landfill.

Ms. White questioned whether backfill soil was clean. Mr. Wrobel replied that a soil profile is conducted on backfill soil for approval. Mr. Stachiw continued that the real COC at G-Street was the lead and that one of the potential risks was the presence of bomblets.

Ms. White asked how the bomblets could be detonated. Mr. Stachiw explained that when chemical bomblets are surrounded by enough explosives, thermal destruction burns up the product and leaves non-toxic chemicals. The reason for the precaution being taken is due to the potential, although very small, to encounter a chemical bomblet.

After a general transportation comment from Ms. White, Mr. Dye explained the precautions and procedures involved in transporting the contaminated soil from "cradle to grave." He described how hazardous materials are treated to be within acceptable levels prior to landfill disposal and explained that fuel/gasoline presents a greater risk in transportation. Waste transportation has more controls since wastes don't have value and cannot be recycled.

Ms. White expressed more concern regarding potential for terrorist use, to which Mr. Dye replied that there are more useful chemicals and locations for terrorists to target in the U.S. and that they would be wasting their time with this site. Mr. Wrobel restated their plan to respond to comments more thoroughly in the ROD.

4.0 Closing Comments

Mr. Wrobel asked if anyone had any additional comments. No additional comments were made.

U.S. ARMY INVITES PUBLIC COMMENT ON PROPOSED PLAN FOR THE G-STREET SALVAGE YARD

The U.S. Army at Aberdeen Proving Ground (APG) invites the public to comment on its Proposed Plan for the G-Street Salvage Yard in the Canal Creek Study Area, located in the Edgewood Area of APG.

FACT SHEET

APG has prepared a fact sheet on the Proposed Plan that includes a comment form that can be returned to APG.

If you are not on APG's mailing list, you can request a copy of the fact sheet by calling APG's 24-hour Environmental Information Line at (410) 272-8842 or (800) APG-9998.

PUBLIC MEETING

APG invites the public to attend a meeting:

Date: Monday, June 25, 2007

Time: 6:00 p.m. –informal poster/ information session
6:45 p.m. –presentation

Place: Edgewood Senior Center
1000 Gateway Road
Edgewood, MD 21040

The meeting location is wheelchair accessible, and an interpreter for the hearing impaired is available with 72-hours advance notice (call 800-APG-9998).

WEB SITE

You can request a copy of the Proposed Plan and provide comments through the APG web site at www.apg.army.mil

WRITTEN COMMENTS

The 45-day public comment period on the proposed action extends from June 25 through August 8, 2007. Written comments, postmarked by August 8, should be sent to:

Mr. Ken Stachiw
Directorate of Safety, Health & Environment
ATTN: IMNE-APG-SHE-R
Building E5771, Magnolia Road
Aberdeen Proving Ground, MD 21010; or

Mr. Frank Vavra
U.S. Environmental Protection Agency
Region III, 1650 Arch Street (3HS11)
Philadelphia, PA 19103-2029; or

Ms. Heather Njo
Maryland Department of the Environment
Federal Facilities Division
1800 Washington Boulevard, Suite 645
Baltimore, MD 21230-1719

PROPOSED ACTION

APG is proposing to take action to address two contaminated soil areas at the G-Street Salvage Yard, which is located in the Canal Creek Study Area of the Edgewood Area of APG. These two areas are the Salvage Yard Soil Area and Burn Residue Disposal Area (BRDA). At the Salvage Yard Soil Area, the primary contaminants of concern are metals and polychlorinated biphenyls (PCBs) in surface soils. At the BRDA, buried residue materials, potentially containing unexploded ordnance (UXO) and/or chemical warfare materiel (CWM), and metals contamination in surface soils are the primary contaminants of concern.

Figure 7. Newspapaer Ad

ALTERNATIVES EVALUATED FOR THE SALVAGE YARD SOIL AREA

No Action: The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requires that a "no action" alternative be evaluated to establish a baseline for comparison to other alternatives. **Cost: $46,000**

Institutional Controls: APG would limit exposure to the contaminated soil by implementing controls including legal mechanisms and notices to restrict access and prohibit unauthorized excavation or construction at the site. **Cost: $412,000**

Low Permeability Cover: APG would construct a low permeability cover, limiting water infiltration, over contaminated soil exceeding industrial and ecological remedial goals (RGs) to limit the potential migration of contaminants from the area, and prevent worker and ecological receptor contact with the soils. Land use controls (LUCs) would limit site access to protect the integrity of the cover, and long-term monitoring (LTM) and maintenance would ensure long-term effectiveness of the cover. **Cost: $1,181,000**

Resource Conservation and Recovery Act (RCRA) Cap: APG would construct a RCRA cap, limiting water infiltration, over contaminated soil exceeding industrial and ecological RGs to limit the potential migration of contaminants from the area, and prevent worker and ecological receptor contact with the soils. A RCRA cap includes a synthetic liner to ensure no water infiltrates through the cap. LUCs would limit site access to protect the integrity of the cap, and LTM and maintenance would ensure long-term effectiveness of the cap. **Cost: $1,252,000**

Soil Excavation and Offsite Disposal: APG would excavate approximately 6,339 cubic yards (yd^3) of surface soil with contaminant concentrations exceeding industrial and ecological RGs and dispose it offsite. **Cost: $2,592,000**

Based on an analysis of the alternatives, APG prefers Soil Excavation and Offsite Disposal. Future land use within the Salvage Yard Soil Area will be limited to industrial.

ALTERNATIVES EVALUATED FOR THE BURN RESIDUE DISPOSAL AREA

No Action: The NCP requires that a "no action" alternative be evaluated to establish a baseline for comparison to other alternatives. **Cost: $46,000**

Improve and Extend Existing Cover: APG would enhance and extend the existing temporary sand cover to provide a permanent containment remedy for protection of human health and the environment from potential contaminants and UXO/CWM. LUCs would limit site access to protect the integrity of the cover, and LTM and maintenance would ensure long-term effectiveness of the cover. **Cost: $729,000**

Excavation and Offsite Disposal: APG would excavate approximately 2,800 yd^3 of BRDA materials and 533 yd^3 of contaminated surface soils and dispose of it offsite. Due to the potential presence of UXO/CWM, excavation and removal of buried residue materials would be conducted under strict Army safety requirements of a UXO/CWM removal action. All intrusive operations into the BRDA materials would be performed in a vapor containment structure in order to contain a CWM release if one were to occur. Surface soils with contaminant concentrations exceeding industrial and ecological RGs would also be excavated. **Cost: $5,317,000**

Based on an analysis of the alternatives, APG prefers Excavation and Offsite Disposal. Future land use within the BRDA will be limited to industrial.

The preferred alternatives may be modified or new alternatives may be developed based on public input. The final alternatives selected will be documented in a Record of Decision (ROD) that summarizes the decision-making process. APG will summarize and respond to comments received during the comment period as part of the ROD. Copies of the Feasibility Study and the Proposed Plan are available for review at the APG information repositories. The repositories are located at the Edgewood (410-612-1600) and Aberdeen (410-273-5608) branches of Harford County Library and Miller Library at Washington College in Kent County (410-778-7280).

Figure 7 Newspaper Ad (Continued)

PART 4: REFERENCES

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