ACCESS NUMBER: A-100

SITE NAME: Bush River

REPORT TITLE: REMOVAL ACTIONS FOR THE ADAMSITE STORAGE VAULTS AT EDGEWOOD AREA, ABERDEEN PROVING GROUND, MARYLAND

AUTHOR: Roy F. Weston

REPORT STATUS: Final

PUBLICATION DATE: February 17, 1994

DATE SENT TO EPA: N/A

DATE SENT TO STATE: N/A

RELEASED TO THE PUBLIC: Yes

ABSTRACT: This Work Plan includes removal actions at the Adamsite Strorage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland. The removal actions include removal of the contents of the vaults, sealing the inside of the vaults, removal of the above ground building structure, securing each vault by filling with nonporous material, soil removal in areas surrounding the vaults, and soil sampling for characterization process.

U.S. Army Corps of Engineers Baltimore District

Baltimore, Maryland

Removal Actions for the Adamsite Storage Vaults at Edgewood Area Aberdeen Proving Ground, Maryland

Contract/Purchase Order No.
DACA87-90-D-0031

Work Plan - Delivery Order 10

17 February 1994

DISTRIBUTION RESTRICTION STATEMENT
APPROVED FOR PUBLIC RELEASE:
DISTRIBUTION IS UNLIMITED.

0440-B-1

94P-1102

WESTON

FINAL WORK PLAN APPROVALS

REMOVAL ACTIONS FOR THE ADAMSITE STORAGE VAULTS AT EDGEWOOD AREA ABERDEEN PROVING GROUND, MARYLAND

CONTRACT NO. DACA87-90-D-0031
DELIVERY ORDER NO. 10

WESTON PROJECT NO. 03886-071-009
Date Prepared: 17 February 1994

Signature

Robert P. Rizzieri, P.E.
Deputy Area Engineer
U.S. Army Corps of Engineers
Aberdeen Area Office

11 MAR '94
Date

Kenneth Stachiw
Chief, Environmental Conservation
and Restoration Division

2 May 94
Date

per Richard Albins
U.S. Army, Aberdeen Proving Ground
Support Activity
Acting Chief, Installation Safety Division
Directorate of Safety, Health, and Environment

5 May 94
Date

Peter A. Ciotoli, AICP
Roy F. Weston, Inc.
Program Manager

18 Feb 1994
Date

for Jeanne O'Leary, CHMM, Const. Mgr.
Roy F. Weston, Inc.
DO Project Manager

18 FEB 1994
Date

Note: Copies of this approved Work Plan will be furnished to the following support agencies:

Commander, Kirk Army Health Clinic — Edgewood Area
Edgewood Research, Development, and Engineering Center (ERDEC)
U.S. Army Technical Escort Unit (TEU)

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	09 December 1993	Site Specific Work Plan, Rev. C

4. TITLE AND SUBTITLE

Removal Actions for the Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland

5. FUNDING NUMBERS

Contract No.
DACA87-90-D-0031

6. AUTHOR(S)

Roy F. Weston, Inc.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Roy F. Weston, Inc.
1 Weston Way
West Chester, PA 19380

Roy F. Weston, Inc.
Bldg #E1356-1T, P.O. Box 65
APG, MD 21010

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Corps of Engineers
4602 Deer Creek Loop
APG, MD 21005

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This Work Plan includes removal actions at the Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland. The removal actions include removal of the contents of the vaults, sealing the inside of the vaults, removal of the above ground building structure, securing each vault by filling with nonporous material, soil removal in areas surrounding the vaults, and soil sampling for characterization purposes.

14. SUBJECT TERMS

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

ROY F. WESTON, INC.
Bldg #E1356-1T
Aberdeen Proving Ground, MD 21010
(410) 612-0712

LETTER OF TRANSMITTAL

Contract No.: #DACA87-90-D-0031
Delivery Order No.: Delivery Order 10
Adamsite Storage Vaults

Commander
Project Officer for DSHE
Bldg 4430, Edgewood Area, APG
Edgewood, MD 2010

Attn: Don Green

Reference: Work Plan (Revision C) for the Removal Actions for the Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland
DCN: APG-8117-10-AADK

X Attached

Copies	Date	Description
4	09DEC93	Work Plan (Revision C) for the Removal Actions for the Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland

These items are transmitted for your action as noted:

X FOR YOUR REVIEW AND COMMENTS

Your comments are requested by 25 January 1994. Your cooperation in adhereing to this suspense date is greatly appreciated. If you have any questions or comments, please contact Roberto Rico or Mike Mazelon at (410) 612-0712.

Transmitted by:

Linda S. Lee
ROY F. WESTON, INC.

10 January 1994
Date

Received By:

Date

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES
(Continued)

LIST OF ACRONYMS

LIST OF ACRONYMS

AA	Aberdeen Area
AHA	Activity Hazard Analysis
AICP	American Institute of Certified Planners
ANSI	American National Standards Institute
APG	Aberdeen Proving Ground
APR	Air Purifying Respirator
ARAR	Applicable or Relevant and Appropriate Requirement
BNA	Base/Neutral/Acid
CAA	Clean Air Act
CAIRA	Chemical Accident/Incident Response Assistance
CAC	Chemical Agent Compound
CAM	Chemical Agent Monitor
CBDA	Chemical Biological Defense Agency
CCMP	Contamination Control Measures Plan
CDAP	Chemical Data Acquisition Plan
CDQM	Chemical Data Quality Management
CEAAO	U.S. Army Corps of Engineers, Aberdeen Area Office
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
CLP	Contract Laboratory Program
CMS/DA	Contaminated Materials Staging/Decontamination Area
CO	Contracting Officer
COMAR	Maryland Code of Regulations
COR	Contracting Officer's Representative
CPR	Cardiopulmonary Resuscitation
CQC	Contractor Quality Control
CQCP	Contractor Quality Control Plan
CRZ	Contamination Reduction Zone
CSD-MB	Chemical Support Division — Monitoring Branch
CSM	Chemical Surety Materials
CWA	Clean Water Act
DAAMS	Depot Area Air Monitoring System
dB	Decibel
DI	Deionized

LIST OF ACRONYMS
(Continued)

DO	Delivery Order
DOT	United States Government Department of Transportation
DQCR	Daily Quality Control Report
DRMO	Defense Reutilization Marketing Office
DSHE	Directorate of Safety, Health, and Environment
DSO	Divisional Safety Officer
EA	Edgewood Area
EMD	Environmental Management Division
EMR	Environmental Medicine Resources, Inc.
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
EPP	Environmental Protection Plan
ERDEC	Edgewood Research, Development, and Engineering Center
FID	Flame Ionization Detector
FSAP	Field Sampling and Analysis Plan
FTs	Field Technicians
FWPCAA	Federal Water Pollution Control Act Amendments
GC/MS	Gas Chromatography/Mass Spectrometry
GP	General Physics
HFA	Human Factors Applications, Inc.
HSWA	Hazardous and Solid Waste Amendments
IATA	International Air Transport Association
ICAD	Individual Chemical Agent Detector
ICAO	International Commercial Aviation Organization
ICt_{50}	Incapacitating Concentration, time avg., 50% population
IDLH	Immediately Dangerous to Life and Health
IRM	Interim Remedial Measure
LCt_{50}	Lethal Concentration, time avg., 50% population
LD	Lethal Dose
LEL	Lower Explosive Limit
LOP	Level of Protection (Personnel Protective Equipment)
MDE	Maryland Department of Environment
MRI	Midwest Research Institute
MSA	Mine Safety Appliances, Inc.
MSDS	Material Safety Data Sheet
MSP	Maximum Skin Protection

LIST OF ACRONYMS
(Continued)

NEPA	National Environmental Policy Act
NFPA	National Fire Prevention Association
NIOSH	National Institute for Occupational Safety and Health
NMR	Nuclear Magnetic Resonance
OSHA	Occupational Safety and Health Act
OT	Oral Temperature
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyl
PE	Professional Engineer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PSI	Pound Per Square Inch
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit
RSO	Regional Safety Officer
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self-Contained Breathing Apparatus
SE	Site Engineer
SHERP	Safety, Health, and Emergency Response Plan
SOP	Standard Operating Procedure
SSHO	Site Safety and Health Officer
SSWP	Site-Specific Work Plan
STEL	Short-Term Exposure Limit
SWDA	Solid Waste Disposal Act
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
TEU	Technical Escort Unit

LIST OF ACRONYMS
(Continued)

TI	Teledyne Isotopes
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
TWA	Time Weighted Average
USAEHA	United States Army Environmental Hygiene Agency
USACE	United States Army Corps of Engineers, Baltimore District
USCG	United States Coast Guard
USGS	United States Geological Survey
UST	Underground Storage Tank
UTMS	Universal Transverse Mercator System
UXO	Unexploded Ordnance
WESTON	Roy F. Weston, Inc.
WMP	Work Management Plan

LIST OF CHEMICAL ACRONYMS

Military Abbreviation	Name
AT	Arsenic trichloride
BZ	3-quinuclidinyl benzilate
CAC	Chloroacetylchloride
CB	Cyanogen bromide
CC2, CC-2	N,N'-dichloro-bis(2,4,6-trichlorophenyl)urea
CDA or CYANDA	Diphenylcyanoarsine
CG	Phosgene, carbonyl chloride
ChloroGB	Isopropylmethylphosphonochloridate
CN	Chloroacetone, Chloroacetophenone
CNB	10% CN, 45% benzene, 45% carbon tetrachloride
CS	Ortho-chlorobenzalmalononitrile, ortho-chlorobenzylidine malononitrile
DA	Diphenylchloroarsine
DC	Methylphosphonic dichloride
DF	Methylphosphonite, methylphosphonic difluoride
DM	Adamsite, diphenylaminechloroarsine
DMHP	Dimethylhydrogen phosphite
DMMP	Dimethylmethylphosphonate
DPU	Sym-diphenylurea
FM	Titanium tetrachloride
FS	Sulfur trioxide-chlorosulfonic acid mixture
GA	Tabun, ethyl N,N-dimethyl phosphoramidocyanidate
GB	Sarin, isopropylmethylphosphonofluoridate
GD	Soman, pinacolylmethylphosphonofluoridate
H	Mustard

LIST OF CHEMICAL ACRONYMS
(continued)

Military Abbreviation	Name
HD	Mustard
HN-1	Bis(2-chloroethyl)ethylamine
HN-3	Tris(2-chloroethyl)amine
HS	Mustard
HT	Mustard
HTH	Calcium hypochlorite
IMPA	Isopropyl methyl phosphonic acid
L	Lewisite, dichloro(2-chlorovinyl)arsine,
M	2-chlorovinyldichloroarsine,
M-1	beta-chlorovinyldichloroarsine
M2, M-2	Dichlorovinylchloroarsine
M3, M-3	Trichlorovinylarsine
M5	Methyldifluoroarsine
MD	Methyldichloroarsine
MD-2	Methyldifluoroarsine
MEA	Monoethanolamine
MF	Methyldifluoroarsine
NaI	Sodium Iodide
NM	Dimethylpolysulfide
O	Ortho-chlorobenzaldehyde
PEG	Polyethylene glycol
PETN	Pentaerythrite tetranitrate
PS	Chloropicrin
QL	Ethyl 2-diisopropylaminoethylmethylphosphonite

LIST OF CHEMICAL ACRONYMS
(continued)

Military Abbreviation	Name
SW	Methyldichlorophosphene, methyldichlorophosphine
TBA	Tributylamine
TCA	2,4,6-trichloroaniline
TCPBA	2,4,6-trichlorophenylbenzoylamine
TCPU	Sym-bis(2,4,6-trichlorophenyl)urea
TEA	Triethylaluminum
TG	Thiodiglycol
TH	Phosphorous trichloride
TR	Diethylmethylphosphonite
VX	O-ethyl S-(2-diisoproplyaminoethyl)-methylphosphonothioate
WP	White phosphorus

LIST OF CDAP/LABORATORY QA ACRONYMS

AA	Atomic Absorption
BNA	Base, Neutrals, Acids
CCB	Continuing Calibration Blank
CCC	Calibration Check Compound
CCV	Continuing Calibration Verification Standard
COC	Chain-of-Custody
GC	Gas Chromatography
GC/FPD	Gas Chromatography/Flame Photometric Detection
GC/MS	Gas Chromatography/Mass Spectrometry
ICB	Initial Calibration Verification Blank
ICP	Inductively Coupled Plasma
ICV	Initial Calibration Verification Standard
IDL	Instrument Detection Limit
IOP	Internal Operating Procedures
LCS	Laboratory Control Standard
MDL	Method Detection Limits
QA	Quality Assurance
QC	Quality Control
%R	Percent Recovery
RPD	Relative Percent Difference
RSD	Percent Relative Standard Deviation
RF	Response Factors
SPCC	System Performance Check Compound

Table 3-8

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Drill Cuttings and Decon Water

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 01082 Decon Water	Sample # 01081 Decon (DUP)	Sample # 01101 MW-1-T-Comp	Sample # 01102 MW-2-T-Comp	Sample # 01103 MW-3-T-Comp	Sample # 00829 Trip Blank	Sample # 00830 Trip Blank
TCLP								
Metals								
– Barium (Total)	100,000 ug/L	126 ug/L	76.2 ug/L	533 ug/L	472 ug/L	771 ug/L	----	----
– Arsenic	5,000 ug/L	ND	ND	ND	144 ug/L	ND	----	----
Volatiles	----	ND	ND	ND	ND	ND	ND	ND
Semivolatiles	----	ND	ND	ND	ND	ND	----	----
Herbicides	----	ND	ND	ND	ND	ND	----	----
Pesticides	----	ND	ND	ND	ND	ND	----	----
Reactivity								
– Cyanide	----	ND	ND	ND	ND	ND	----	----
– Sulfide	----	ND	8.69 mg/kg	11.5 mg/kg	13.8 mg/kg	14.4 mg/kg	----	----
PCBs	----	ND	ND	----	----	---	----	----
Corrosivity (pH)	< 2 or > 12.5	7.78	7.66	5.9	5.55	5.86	----	----
Ignitibility	----	No flash	No flash	No flash	No flash	No flash	----	----
Nitrate	----	0.091 mg/L	0.09 mg/L	----	----	----	----	----

Table 3-9

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Soil Boring Tailings

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 01104 B-1-T-Comp	Sample # 01105 B-2-T-Comp	Sample # 01106 B-3-T-Comp	Sample # 01107 B-3-T-Comp (DUP)	Sample # 00834 Trip Blank	Sample # 00835 Trip Blank	TCLP Blank
TCLP								
Metals								
– Arsenic	5,000 ug/L	ND	276 ug/L	ND	ND	----	----	ND
– Barium (Total)	100,000 ug/L	624 ug/L	649 ug/L	178 ug/L	416 ug/L	----	----	ND
Volatiles	----	ND	ND	ND	ND	ND	ND	ND
Semivolatiles	----	ND	ND	ND	ND	----	----	ND
Herbicides	----	ND	ND	ND	ND	----	----	ND
Pesticides	----	ND	ND	ND	ND	----	----	ND
Reactivity								
– Cyanide	----	ND	ND	ND	ND	----	----	----
– Sulfide	----	14.3 mg/kg	19.3 mg/kg	19.8 mg/kg	20.8 mg/kg	----	----	----
Corrosivity (pH)	< 2 or > 12.5	4.72	7.21	6.17	5.64	----	----	----
Ignitibility	----	No flash	No flash	No flash	No flash	----	----	----

SECTION 1

INTRODUCTION

TABLE OF CONTENTS

LIST OF FIGURES

SECTION 1

INTRODUCTION

The U.S. Army Corps of Engineers, Aberdeen Area Office (CEAAO), is providing environmental remediation support to the Aberdeen Proving Ground (APG) Environmental Management Division (EMD) for remediation activities negotiated between the Department of the Army and the U.S. Environmental Protection Agency (EPA). In support of this effort, CEAAO will employ contracted analytical laboratory and remedial action (RA) services.

CEAAO has tasked Roy F. Weston, Inc. (WESTON®) with implementing a removal action at Building E-2370, the former Adamsite Storage Vaults, which is located in Edgewood at the Bush River Research Operations Area of APG. Federal, state, and local statutes and associated regulations applicable to this action are listed in Attachment 1-1. Applicable or relevant and appropriate requirements (ARARs) pertinent to this action are discussed in Subsection 2.5 of this document. This Site-Specific Work Plan (SSWP) is intended to be used in conjunction with the "Standard Supplement to the SSWPs for Edgewood Area, Aberdeen Proving Ground, Maryland" (Standard Supplement). The Standard Supplement contains attachments referenced in this SSWP.

The objective of this removal action is to mitigate the potential hazard to the environment and to human health presented by contaminants that may infiltrate from contaminated soil and groundwater in the vicinity of the Adamsite Storage Vaults. Actions to be performed under the scope of this effort include:

- Removal of the existing water and sediments from the vaults.
- Removal of the aboveground building structure.
- Securement of each vault through sealing the floors and sidewalls with a sealant material and backfilling with nonporous material.
- Removal of surface contaminants surrounding the vault.

1.1 SITE LOCATION AND HISTORICAL BACKGROUND

Building E-2370, the former Adamsite Storage Vaults, is located on the eastern side of the peninsula between the Gunpowder River and the Bush River, in an area of Edgewood known as the Bush River Research Operations Area of APG, as shown in Figure 1-1. Two vaults, the Northeast (NE) vault and the Southwest (SW) vault, are located in the building and are separated by a concrete wall.

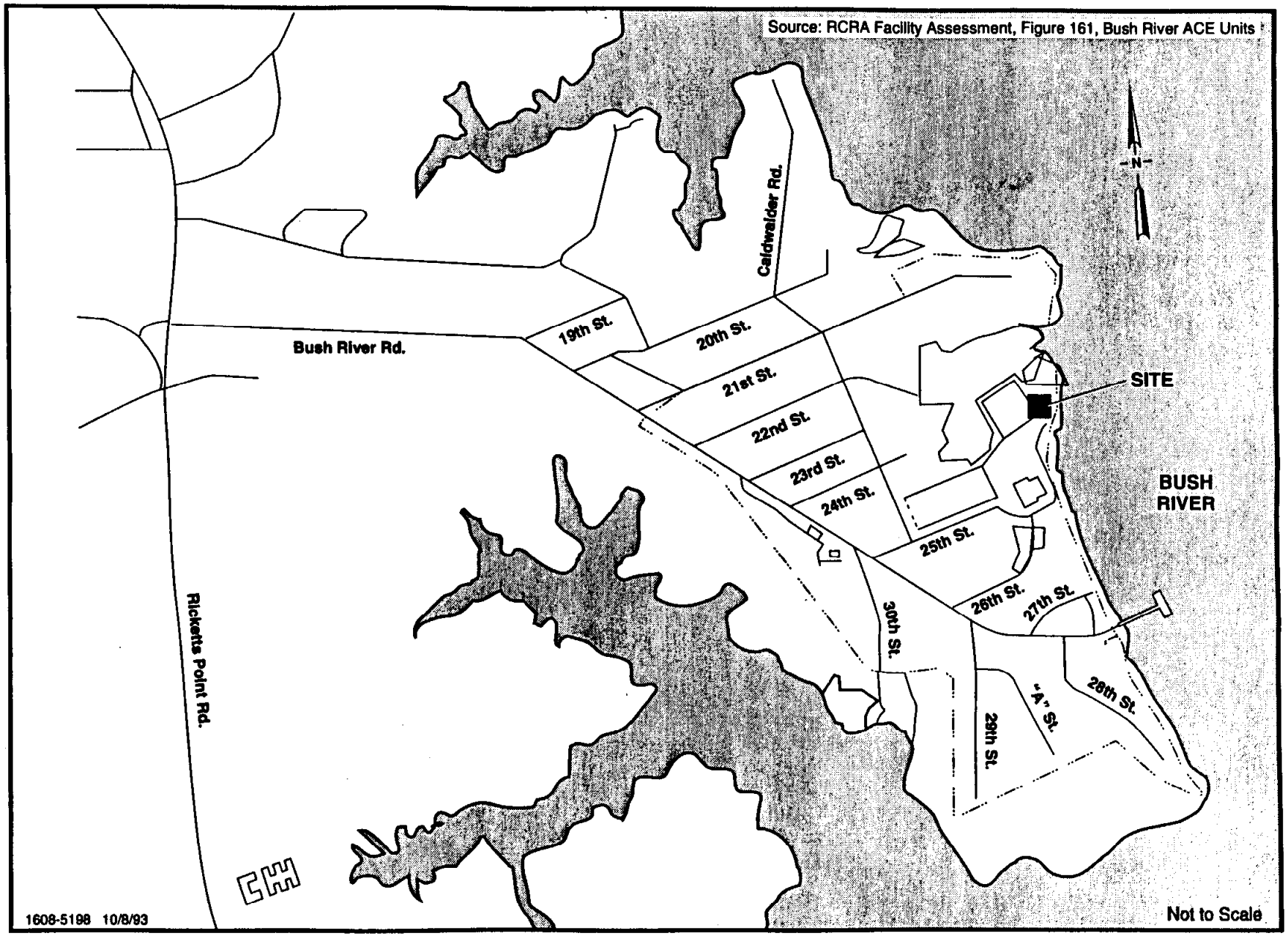


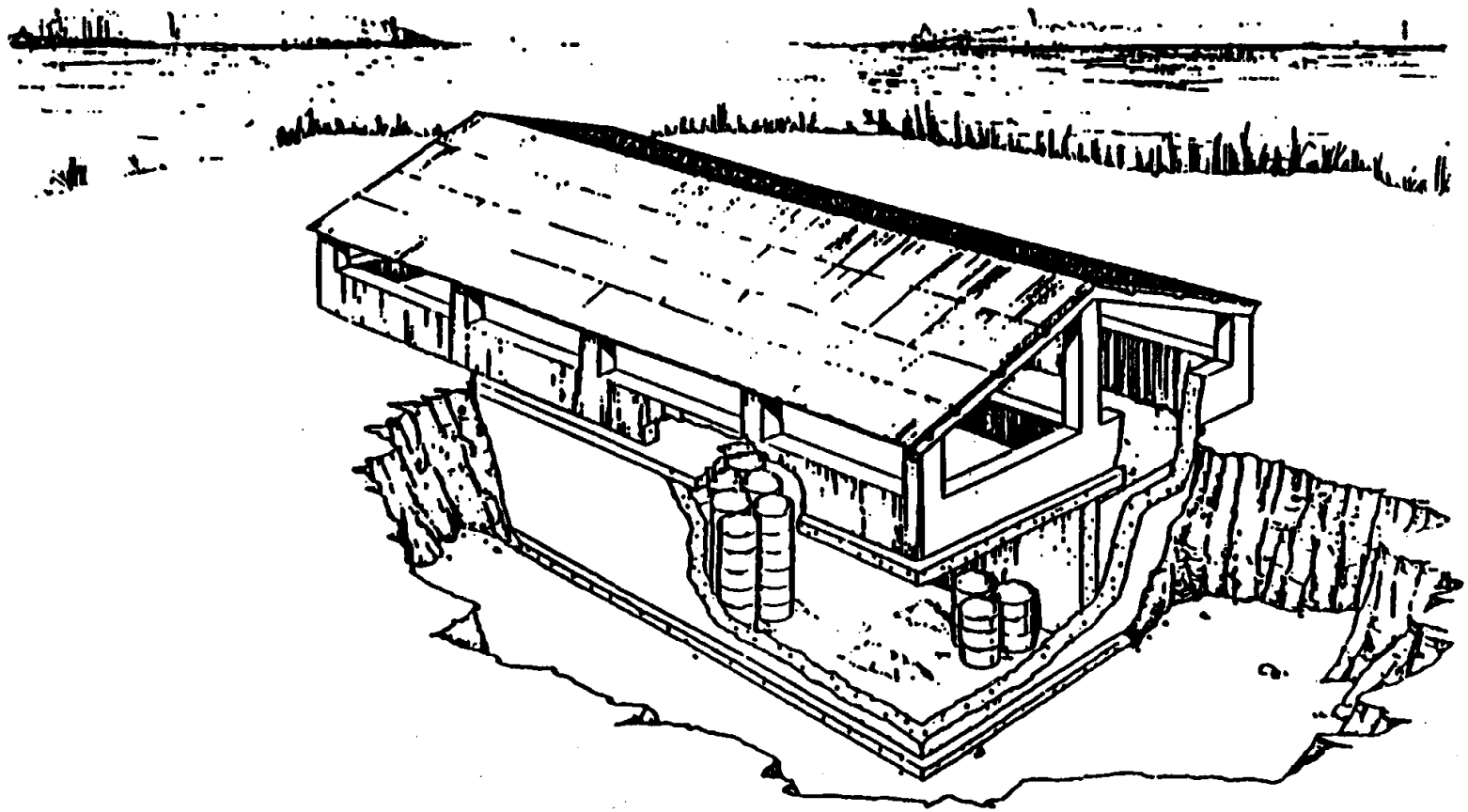
FIGURE 1-1 SITE LOCATION MAP, BUSH RIVER RESEARCH OPERATION AREA, ADAMSITE STORAGE VAULTS, APG, MD

The building was constructed in 1931 and used for the bulk storage of white phosphorus underwater until 1960, according to the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) Report, Edgewood Area, Aberdeen Proving Ground (Nemeth, 1989). In 1960, the SW vault was used to store Adamsite (DM, diphenyl cyanoarsine) prior to disposal (Nemeth, 1989). More than 700 55-gallon drums were placed in the vault in two layers and surrounded with sand (Nemeth, 1989). A concrete pad was poured to form a ceiling over the drums 1 ft thick at ground level (Nemeth, 1989). According to the RFA Report, the drums of DM were removed in 1983, and the bulk of the sand and concrete cap was also removed off-site for disposal. The RFA also states that one of the recovered drums contained chloroacetophenone (CN), a lachrymator and an active ingredient in the riot control gas mace (Nemeth, 1989). CN may have been stored in or around the facility (Nemeth, 1989). Reports that the NE vault was used for storing wastewater from a nearby shower house for personnel engaged in radioactive waste disposal have been recorded (Barr, 1977), but are unsubstantiated. Sediment was removed from the SW vault in the late 1980s by Chemical Waste Management (CWM) under contract to the Directorate of Safety, Health, and Environment (DSHE). There has been no use of the building since 1983. An artist's sketch of the building is shown in Figure 1-2.

1.2 PREVIOUS ASSESSMENTS

In 1976, 15 12-ft-deep soil borings were taken from around the building by the Baltimore District U.S. Army Corps of Engineers (CENAB) in order to determine if contamination from the vaults was entering the surrounding area (Technical Report ARCSL-TR-77050, June 1977). Arsenic concentrations up to 60 parts per million (ppm) were found in the soils at the southern corner of the property. Arsenic was the only parameter analyzed at that time.

In May 1992, General Physics (GP), under contract to DSHE, sampled the sediment and water in the NE vault. One sample each of water and sediment was collected and analyzed for Target Analyte List/Target Compound List (TAL/TCL) parameters and gross alpha and gross beta contamination. The GP analytical report dated 11 June 1992 indicated that several chemicals were present in the samples of water and sediment collected from the NE vault. The GP Report is included in Attachment 1-2. The following analytical results were extracted from the GP Report dated 11 June 1992.



Source: Baltimore District USACE Technical Report, ARCSL-TR-77050, June 1977

1595-5088 9/17/93

Partial list of analytical results for the NE vault sediment:

Arsenic	1,370 ppm	Barium	573 ppm
Lead	25,000 ppm	Cyanide	12 ppm
Copper	422 ppm	Gross alpha	12 ± 5 pCi/g
Chromium	183 ppm	Gross beta	25 ± 3 pCi/g

Partial list of analytical results for the NE vault water:

Tetrachloroethane	91 ppb	Copper	422 ppm
Arsenic	1,370 ppb	Gross alpha	12 ± 5 pCi/g
Lead	25,000 ppm	Gross beta	25 ± 3 pCi/g
Chromium	183 ppm		

Under Contract No. DACA87-90-D-0031, WESTON performed field investigation activities at the Adamsite Vaults in July and August 1993. The field investigation activities focused on sampling the soils surrounding the vaults, determining the depth of and sampling the groundwater near the vaults, sampling the water and sediments remaining in the vaults for additional characterization purposes, and sampling the vault concrete. WESTON obtained one water sample and two sediment samples from the NE vault, two sediment samples from the SW vault, and concrete samples at two discrete intervals at two locations in each vault. All of these samples were analyzed for Toxicity Characteristic Leachate Procedure (TCLP) parameters and radionuclides and were determined to be nonhazardous waste. Samples retrieved from soil borings around the vaults revealed surface contamination of polychlorinated biphenyls (PCBs), arsenic, mercury, and beryllium in samples up to 12 ft in depth. Groundwater samples were obtained and indicated the presence of chloroform, 1,1,2,2-tetrachloroethane, tetrachloroethane, trichloroethane, beryllium, and 1,1,2-trichloroethane. Attachment 1-3 includes Summary of Results - From the Preliminary Field Investigation Report; Sampling of the Adamsite Storage Vaults at Edgwood Area, WESTON, 22 October 1993 (WESTON, 1993).

Recommendations were made in the Preliminary Field Investigation Report (WESTON, 1993) to remove the portion of the building structure that extends above the ground surface, remove the contents of the vaults, including water and sediment, seal the inside of the vaults with an impermeable material, backfill the vaults with flowable fill, and remove surface soil contamination from areas surrounding the vaults.

1.3 GENERAL APPROACH

WESTON has developed this SSWP for the performance of Delivery Order (DO) No. 10 at APG-EA. This plan includes the following subplans:

- Work Management Plan (WMP).
- Contractor Quality Control Plan (CQCP).
- Safety, Health, and Emergency Response Plan (SHERP).
- Field Sampling and Analysis Plan (FSAP).
- Environmental Protection Plan (EPP).

Each of these plans concentrates on different aspects of the project, while as a whole, they define the procedures and guidelines for implementing the mitigative actions and management activities associated with this DO.

ATTACHMENT 1-1: ASSOCIATED REGULATIONS APPLICABLE TO THIS ACTION

Attachment 1-1

Associated Regulations Applicable to this Action

- **Public Law 91-190**, The National Environmental Policy Act (NEPA'70), 83 Stat. 852 et seq., 1 January 1970, as amended. Codified in **Title 42 USC § 4321 et seq. (NEPA'70)**.

- **Public Law 92-500**, Federal Water Pollution Control Act Amendments of 1972 (FWPCAa'72) [a.k.a. Clean Water Act (CWA'72)], 86 Stat. 1251 et seq., 18 October 1972, as amended. Codified in **Title 16 USC § 661 et seq. (FWPCAa'72)** and **Title 33 USC § 1251 et seq. (CWA'72)**.

- **Public Law 94-469**, Toxic Substance Control Act (TSCA'76), 90 Stat. 2003 et seq., 11 October 1976, as amended. Codified in **Title 15 USC § 2601 et seq. (TSCA'76)**.

- **Public Law 94-580**, Resource Conservation and Recovery Act of 1976 (RCRA'76), 90 Stat. 2795 et seq., 21 October 1976, as amended. Codified in **Title 42 USC § 6901 et seq. (RCRA'76)**.

- **Public Law 96-483**, Solid Waste Disposal Act Amendments of 1980 (SWDA'80), 94 Stat. 2334 et seq., 21 October 1980, as amended.

- **Public Law 95-510**, Comprehensive Environmental Compensation and Liability Act of 1980 (CERCLA'80), 94 Stat. 2767 et seq., 11 December 1980, as amended. Codified in **Title 42 USC § 9601 et seq. (CERCLA'80)**.

- **Public Law 96-616**, Hazardous and Solid Waste Amendments of 1980 (HSWa'80), 08 November 1980. Codified in **Title 42 USC § 6901 et seq. (RCRA'76)**.

- **Public Law 99-499**, Superfund Amendment and Reauthorization Act of 1986 (SARA'86), 100 Stat. 1724 et seq., 17 October 1986. Codified in **Title 10 USC § 2701 et seq. (SARA'86)**.

  Special attention to: § 211, Department of Defense Environmental Restoration Program.

- **EO 11990** (24 May 1977), Protection of Wetlands, as amended.

- Code of Federal Regulations (CFR):

  - **Title 29:** Parts 1910 & 1926
  - **Title 40:** Parts 260 - 268, 271, and 700 to end
  - **Title 49:** Parts 107, 171-178

- **AR 55-56**, Transportation of Dangerous or Hazardous Materials.
- **AR 190-40**, Serious Incident Reports.
- **AR 385-10**, The Army Safety Program.
- **AR 385-32**, Protective Clothing and Equipment.
- **AR 385-40**, Accident Reporting and Records.
- **AR 385-55**, Prevention of Motor Vehicle Accidents.
- **AR 420-47**, Solid & Hazardous Waste Management.
- **ER 385-1-92**, Safety and Occupational Health Document Requirements for Hazardous Waste Site Remediation Actions.
- **EM 385-1-1**, Safety and Health Requirements Manual.
- **AMC-R 385-100**, Safety Manual.
- Annotated Code of Maryland Environmental Article, Title 7, Hazardous Materials and Hazardous Substances, Subtitle 2, Controlled Hazardous Substances.
- Maryland Code of Regulations (COMAR), Title 26, Department of the Environment, Subtitle 9, Chapter 1, Sedimentation and Erosion Control.
- Maryland Code of Regulations (COMAR), 3.2. Title 26, Department of the Environment, Subtitle 13, Disposal of Controlled Hazardous Substances.
- International Air Transport Association (IATA), Dangerous Goods Regulations.
- International Commercial Aviation Organization (ICAO), Technical Instructions for the Safe Transportation of Dangerous Goods.

ATTACHMENT 1-2: GP ANALYTICAL REPORT DATED 11 JUNE 1992

GP Work Order # 92-05-187

SAMPLE ANALYSIS REPORT

Prepared For:

Dir. of Safety, Health & Env.
Bldg. EA 4430, Aberdeen
Edgewood, MD 21010-5401

ARM 410

Prepared By:

GP Environmental Services
202 Perry Parkway
Gaithersburg, Maryland 20877

June 11, 1992

for Paul Ioannides, Laboratory Director

GP ENVIRONMENTAL SERVICES
ANALYTICAL RESULTS

Work order: 9205187
Work ID: ARM 410
Date Received: 05/20/92

Dir. of Safety, Health & Env.
Bldg. EA 4430, Aberdeen
Edgewood, MD 21010-5401
Atten: Mr. Bob Solyan

GP ENVIRONMENTAL SERVICES
202 Perry Parkway
Gaithersburg, MD 20877

Atten: Client Services
Phone: (800) 926-6802

Certified by: _____

SAMPLE IDENTIFICATION

GP ID	Client ID
9205187-01A	325-2141-EZ370W
9205187-01B	
9205187-01C	
9205187-01D	
9205187-01E	
9205187-01F	
9205187-01G	
9205187-01H	
9205187-01I	
9205187-01J	
9205187-01K	
9205187-01L	
9205187-01M	
9205187-02A	326-2141-EZ370S
9205187-02B	
9205187-02C	
9205187-02D	

GP ENVIRONMENTAL SERVICES
ANALYTICAL RESULTS

Work order: 9205187
Work ID: ARM 410
Date Received: 05/20/92

Dir. of Safety, Health & Env.
Bldg. EA 4430, Aberdeen
Edgewood, MD 21010-5401
Atten: Mr. Bob Solyan

GP ENVIRONMENTAL SERVICES
202 Perry Parkway
Gaithersburg, MD 20877

Atten: Client Services
Phone: (800) 926-6802

Certified by: _____

SAMPLE IDENTIFICATION

GP ID	Client ID
9205187-01A	325-2141-EZ3704
9205187-01B	
9205187-01C	
9205187-01D	
9205187-01E	
9205187-01F	
9205187-01G	
9205187-01H	
9205187-01I	
9205187-01J	
9205187-01K	
9205187-01L	
9205187-01M	
9205187-02A	326-2141-EZ3705
9205187-02B	
9205187-02C	
9205187-02D	

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01A
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8270
Units: ug/L

Analyst: FP
Analyzed: 05/28/92
Extracted: 05/26/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,2,4-Trichlorobenzene	BQL	11	
1,2-Dichlorobenzene	BQL	11	
1,3-Dichlorobenzene	BQL	11	
1,4-Dichlorobenzene	BQL	11	
2,4,5-Trichlorophenol	BQL	11	
2,4,6-Trichlorophenol	BQC	11	
2,4-Dichlorophenol	BQL	11	
2,4-Dimethylphenol	BQL	11	
2,4-Dinitrophenol	BQI	54	
2,4-Dinitrotoluene	BQL	11	
2,6-Dinitrotoluene	BQL	11	
2-Chloronaphthalene	BQL	11	
2-Chlorophenol	BQL	11	
2-Methylnaphthalene	BQL	11	
2-Methylphenol	BQL	11	
2-Nitroaniline	BQL	54	
2-Nitrophenol	BQL	11	
3,3'-Dichlorobenzidine	BQL	22	
3-Nitroaniline	BQL	54	
4,6-Dinitro-2-methylphenol	BQL	54	
4-Bromophenyl phenyl ether	BQL	11	
4-Chloro-3-methylphenol	BQL	22	
4-Chloroaniline	BQL	22	
4-Chlorophenyl phenyl ether	BQL	11	
4-Methylphenol	BQL	11	
4-Nitroaniline	BQL	22	
4-Nitrophenol	BQL	54	
Acenaphthene	BQL	11	
Acenaphthylene	BQL	11	
Anthracene	BQL	11	
Benzo(a)anthracene	BQL	11	
Benzo(a)pyrene	BQL	11	
Benzo(b)fluoranthene	BQL	11	

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01A
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8270
Units: ug/L

Analyst: FP
Analyzed: 05/28/92
Extracted: 05/26/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,2,4-Trichlorobenzene	BDL	11	
1,2-Dichlorobenzene	BDL	11	
1,3-Dichlorobenzene	BDL	11	
1,4-Dichlorobenzene	BDL	11	
2,4,5-Trichlorophenol	BDL	11	
2,4,6-Trichlorophenol	BDL	11	
2,4-Dichlorophenol	BDL	11	
2,4-Dimethylphenol	BDL	11	
2,4-Dinitrophenol	BDL	54	
2,4-Dinitrotoluene	BDL	11	
2,6-Dinitrotoluene	BDL	11	
2-Chloronaphthalene	BDL	11	
2-Chlorophenol	BDL	11	
2-Methylnaphthalene	BDL	11	
2-Methylphenol	BDL	11	
2-Nitroaniline	BDL	54	
2-Nitrophenol	BDL	11	
3,3'-Dichlorobenzidine	BDL	22	
3-Nitroaniline	BDL	54	
4,6-Dinitro-2-methylphenol	BDL	54	
4-Bromophenyl phenyl ether	BDL	11	
4-Chloro-3-methylphenol	BDL	22	
4-Chloroaniline	BDL	22	
4-Chlorophenyl phenyl ether	BDL	11	
4-Methylphenol	BDL	11	
4-Nitroaniline	BDL	22	
4-Nitrophenol	BDL	54	
Acenaphthene	BDL	11	
Acenaphthylene	BDL	11	
Anthracene	BDL	11	
Benzo(a)anthracene	BDL	11	
Benzo(a)pyrene	BDL	11	
Benzo(b)fluoranthene	BDL	11	

Notes and definitions for this report:
BDL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01A
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8270
Units: ug/L

Analyst: FP
Analyzed: 05/28/92
Extracted: 05/26/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
Benzo(g,h,i)perylene	BQL	11	
Benzo(k)fluoranthene	BQL	11	
Benzoic acid	84.8	54	
Benzyl alcohol	BQL	22	
Butyl benzyl phthalate	BQL	11	
Chrysene	BQL	11	
Di-n-butylphthalate	BQL	11	
Di-n-octylphthalate	BQL	11	
Dibenz(a,h)anthracene	BQL	11	
Dibenzofuran	BQL	11	
Diethylphthalate	BQL	11	
Dimethyl phthalate	BQL	11	
Fluoranthene	BQL	11	
Fluorene	BQL	11	
Hexachlorobenzene	BQL	11	
Hexachlorobutadiene	BQL	11	
Hexachlorocyclopentadiene	BQL	11	
3.0 Hexachloroethane	BQL	11	
Indeno(1,2,3-cd)pyrene	BQL	11	
Isophorone	BQL	11	
N-Nitroso-di-n-dipropylamine	BQL	11	
N-nitrosodiphenylamine	BQL	11	
Naphthalene	BQL	11	
Nitrobenzene	BQL	11	
Pentachlorophenol	BQL	54	
Phenanthrene	BQL	11	
Phenol	BQL	11	
Pyrene	BQL	11	
bis(2-Chloroethoxy) methane	BQL	11	
bis(2-Chloroethyl) ether	BQL	11	
bis(2-Chloroisopropyl) ether	BQL	11	
bis(2-Ethylhexyl)phthalate	BQL	11	

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01A
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8270
Units: ug/L

Analyst: FP
Analyzed: 05/28/92
Extracted: 05/26/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
Benzo(g,h,i)perylene	BQL	11	
Benzo(k)fluoranthene	BQL	11	
Benzoic acid	84.8	54	
Benzyl alcohol	BQL	22	
Butyl benzyl phthalate	BQL	11	
Chrysene	BQL	11	
Di-n-butylphthalate	BQL	11	
Di-n-octylphthalate	BQL	11	
Dibenz(a,h)anthracene	BQL	11	
Dibenzofuran	BQL	11	
Diethylphthalate	BQL	11	
Dimethyl phthalate	BQL	11	
Fluoranthene	BQL	11	
Fluorene	BQL	11	
Hexachlorobenzene	BQL	11	
Hexachlorobutadiene	BQL	11	
Hexachlorocyclopentadiene	BQL	11	
Hexachloroethane	BQL	11	
Indeno(1,2,3-cd)pyrene	BQL	11	
Isophorone	BQL	11	
N-Nitroso-di-n-dipropylamine	BQL	11	
N-nitrosodiphenylamine	BQL	11	
Naphthalene	BQL	11	
Nitrobenzene	BQL	11	
Pentachlorophenol	BQL	54	
Phenanthrene	BQL	11	
Phenol	BQL	11	
Pyrene	BQL	11	
bis(2-Chloroethoxy) methane	BQL	11	
bis(2-Chloroethyl) ether	BQL	11	
bis(2-Chloroisopropyl) ether	BQL	11	
bis(2-Ethylhexyl)phthalate	BQL	11	

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-010
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: SW846 8080
Units: ug/L

Analyst: PM
Analyzed: 05/23/92
Extracted: 05/21/92

GC TARGET COMPOUNDS

	Parameter	Result	Det.Lim.	Qualifier
	4,4'-DDD	BQL	0.11	
	4,4'-DDE	8.94	0.041	
	4,4'-DDT	BQL	0.12	
	Aldrin	BQL	0.041	
	Aroclor-1016	BQL	0.52	
	Aroclor-1221	BQL	0.52	
	Aroclor-1232	BQL	0.52	
	Aroclor-1242	BQL	0.67	
	Aroclor-1248	BQL	1.0	
	Aroclor-1254	BQL	1.0	
	Aroclor-1260	BQL	1.0	
	Chlordane	BQL	0.14	
	Dieldrin	BQL	0.021	
	Endosulfan I	BQL	0.14	
	Endosulfan II	BQL	0.041	
	Endosulfan sulfate	BQL	0.68	
0.02	Endrin	BQL	0.062	
	Endrin aldehyde	BQL	0.24	
0.008	Heptachlor	BQL	0.031	
0.008	Heptachlor Epoxide	BQL	0.85	
10	Methoxychlor	BQL	1.8	
	Toxaphene	BQL	2.5	
	alpha-BHC	BQL	0.031	
	beta-BHC	BQL	0.062	
	delta-BHC	BQL	0.093	
	gamma-BHC (Lindane)	BQL	0.041	

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01D
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: SW846 8080
Units: ug/L

Analyst: PH
Analyzed: 05/23/92
Extracted: 05/21/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BDL	0.11	
4,4'-DDE	8.94	0.041	
4,4'-DDT	BDL	0.12	
Aldrin	BDL	0.041	
Aroclor-1016	BDL	0.52	
Aroclor-1221	BDL	0.52	
Aroclor-1232	BDL	0.52	
Aroclor-1242	BDL	0.67	
Aroclor-1248	BDL	1.0	
Aroclor-1254	BDL	1.0	
Aroclor-1260	BDL	1.0	
Chlordane	BDL	0.14	
Dieldrin	BDL	0.021	
Endosulfan I	BDL	0.14	
Endosulfan II	BDL	0.041	
Endosulfan sulfate	BDL	0.68	
Endrin	BDL	0.062	
Endrin aldehyde	BDL	0.26	
Heptachlor	BDL	0.031	
Heptachlor Epoxide	BDL	0.85	
Methoxychlor	BDL	1.8	
Toxaphene	BDL	2.5	
alpha-BHC	BDL	0.031	
beta-BHC	BDL	0.062	
delta-BHC	BDL	0.093	
gamma-BHC (Lindane)	BDL	0.041	

Notes and definitions for this report:
BDL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01K
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8240W
Units: ug/l

Analyst: DR
Analyzed: 05/29/92

VOLATILE TARGET COMPOUNDS

	Parameter	Result	Det.Lim.	Qualifier
	1,1,1-Trichloroethane	BQL	5.0	
	1,1,2,2-Tetrachloroethane	BQL	5.0	
	1,1,2-Trichloroethane	BQL	5.0	
	1,1-Dichloroethane	BQL	5.0	
0.7	1,1-Dichloroethene	BQL	5.0	
0.5	1,2-Dichloroethane	BQL	5.0	
	1,2-Dichloropropane	BQL	5.0	
	2-Butanone	BQL	100	
	2-Chloroethylvinyl ether	BQL	10	
	2-Hexanone	BQL	50	
	4-Methyl-2-pentanone	BQL	50	
	Acetone	156	100	
5mg/l	Benzene	BQL	5.0	
	Bromodichloromethane	BQL	5.0	
	Bromoform	BQL	5.0	
	Bromomethane	BQL	10	
	Carbon Disulfide	BQL	100	
0.5	Carbon Tetrachloride	BQL	5.0	
100	Chlorobenzene	BQL	5.0	
	Chlorodibromomethane	BQL	5.0	
	Chloroethane	BQL	10	
6	Chloroform	BQL	5.0	
	Chloromethane	BQL	10	
	Ethylbenzene	BQL	5.0	
	Methylene Chloride	2.49	5.0	J
	Styrene	BQL	5.0	
	Tetrachloroethene	BQL	5.0	
	Toluene	BQL	5.0	
	Trichloroethene	BQL	5.0	
	Vinyl Acetate	BQL	50	
	Vinyl Chloride	BQL	10	
	Xylene	BQL	5.0	
	cis-1,3-Dichloropropene	BQL	5.0	
	trans-1,2-Dichloroethene	BQL	5.0	
	trans-1,3-Dichloropropene	BQL	5.0	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-01K
Client ID: 325-2141-E2370W
Collected: 05/20/92
Dilution: 1

Matrix: WATER
Method: 8240W
Units: ug/L

Analyst: DR
Analyzed: 05/29/92

VOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,1,1-Trichloroethane	BQL	5.0	
1,1,2,2-Tetrachloroethane	BQL	5.0	
1,1,2-Trichloroethane	BQL	5.0	
1,1-Dichloroethane	BQL	5.0	
1,1-Dichloroethene	BQL	5.0	
1,2-Dichloroethane	BQL	5.0	
1,2-Dichloropropane	BQL	5.0	
2-Butanone	BQL	100	
2-Chloroethylvinyl ether	BQL	10	
2-Hexanone	BQL	50	
4-Methyl-2-pentanone	BQL	50	
Acetone	156	100	
Benzene	BQL	5.0	
Bromodichloromethane	BQL	5.0	
Bromoform	BQL	5.0	
Bromomethane	BQL	10	
Carbon Disulfide	BQL	100	
Carbon Tetrachloride	BQL	5.0	
Chlorobenzene	BQL	5.0	
Chlorodibromomethane	BQL	5.0	
Chloroethane	BQL	10	
Chloroform	BQL	5.0	
Chloromethane	BQL	10	
Ethylbenzene	BQL	5.0	
Methylene Chloride	2.69	5.0	J
Styrene	BQL	5.0	
Tetrachloroethene	BQL	5.0	
Toluene	BQL	5.0	
Trichloroethene	BQL	5.0	
Vinyl Acetate	BQL	50	
Vinyl Chloride	BQL	10	
Xylene	BQL	5.0	
cis-1,3-Dichloropropene	BQL	5.0	
trans-1,2-Dichloroethene	BQL	5.0	
trans-1,3-Dichloropropene	BQL	5.0	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 20

Matrix: SEDIMENT
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 06/05/92
Extracted: 06/02/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	58.2	230	J
4,4'-DDE	43.3	84	J
4,4'-DDT	150	250	J
Aldrin	BQL	84	
Aroclor-1016	BQL	1100	
Aroclor-1221	BQL	1100	
Aroclor-1232	BQL	1100	
Aroclor-1242	BQL	1400	
Aroclor-1248	BQL	2100	
Aroclor-1254	BQL	2100	
Aroclor-1260	BQL	2100	
Chlordane	BQL	300	
Dieldrin	BQL	42	
Endosulfan I	BQL	300	
Endosulfan II	8.44	84	J
Endosulfan sulfate	9.26	1400	J
Endrin	7.01	130	J
Endrin aldehyde	24.4	490	J
Heptachlor	BQL	64	
Heptachlor Epoxide	BQL	1800	
Methoxychlor	79.6	3700	J
Toxaphene	BQL	5100	
alpha-BHC	BQL	64	
beta-BHC	BQL	130	
delta-BHC	8.86	190	J
gamma-BHC (Lindane)	BQL	84	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 20

Matrix: SEDIMENT
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 06/05/92
Extracted: 06/02/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	58.2	230	J
4,4'-DDE	43.3	84	J
4,4'-DDT	150	250	J
Aldrin	BQL	84	
Aroclor-1016	BQL	1100	
Aroclor-1221	BQL	1100	
Aroclor-1232	BQL	1100	
Aroclor-1242	BQL	1400	
Aroclor-1248	BQL	2100	
Aroclor-1254	BQL	2100	
Aroclor-1260	BQL	2100	
Chlordane	BQL	300	
Dieldrin	BQL	42	
Endosulfan I	BQL	300	
Endosulfan II	8.44	84	J
Endosulfan sulfate	9.24	1400	J
Endrin	7.01	130	J
Endrin aldehyde	24.4	490	J
Heptachlor	BQL	64	
Heptachlor Epoxide	BQL	1800	
Methoxychlor	79.4	3700	J
Toxaphene	BQL	5100	
alpha-BHC	BQL	64	
beta-BHC	BQL	130	
delta-BHC	8.86	190	J
gamma-BHC (Lindane)	BQL	84	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8270
Units: ug/Kg

Analyst: FP
Analyzed: 06/05/92
Extracted: 06/02/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,2,4-Trichlorobenzene	BQL	1000	
1,2-Dichlorobenzene	BQL	1000	
1,3-Dichlorobenzene	BQL	1000	
1,4-Dichlorobenzene	BQL	1000	
2,4,5-Trichlorophenol	BQL	1000	
2,4,6-Trichlorophenol	BQL	1000	
2,4-Dichlorophenol	BQL	1000	
2,4-Dimethylphenol	BQL	1000	
2,4-Dinitrophenol	BQL	5200	
2,4-Dinitrotoluene	BQL	1000	
2,6-Dinitrotoluene	BQL	1000	
2-Chloronaphthalene	BQL	1000	
2-Chlorophenol	BQL	1000	
2-Methylnaphthalene	BQL	1000	
2-Methylphenol	BQL	1000	
2-Nitroaniline	BQL	5200	
2-Nitrophenol	BQL	1000	
3,3'-Dichlorobenzidine	BQL	2000	
3-Nitroaniline	BQL	5200	
4,6-Dinitro-2-methylphenol	BQL	5200	
4-Bromophenyl phenyl ether	BQL	1000	
4-Chloro-3-methylphenol	BQL	2000	
4-Chloroaniline	BQL	2000	
4-Chlorophenyl phenyl ether	BQL	1000	
4-Methylphenol	BQL	1000	
4-Nitroaniline	BQL	2000	
4-Nitrophenol	BQL	5200	
Acenaphthene	BQL	1000	
Acenaphthylene	BQL	1000	
Anthracene	263	1000	J
Benzo(a)anthracene	1040	1000	
Benzo(a)pyrene	1650	1000	
Benzo(b)fluoranthene	4890	1000	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8270
Units: ug/Kg

Analyst: FP
Analyzed: 06/05/92
Extracted: 06/02/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,2,4-Trichlorobenzene	BQL	1000	
1,2-Dichlorobenzene	BQL	1000	
1,3-Dichlorobenzene	BQL	1000	
1,4-Dichlorobenzene	BQL	1000	
2,4,5-Trichlorophenol	BQL	1000	
2,4,6-Trichlorophenol	BQL	1000	
2,4-Dichlorophenol	BQL	1000	
2,4-Dimethylphenol	BQL	1000	
2,4-Dinitrophenol	BQL	5200	
2,4-Dinitrotoluene	BQL	1000	
2,6-Dinitrotoluene	BQL	1000	
2-Chloronaphthalene	BQL	1000	
2-Chlorophenol	BQL	1000	
2-Methylnaphthalene	BQL	1000	
2-Methylphenol	BQL	1000	
2-Nitroaniline	BQL	5200	
2-Nitrophenol	BQL	1000	
3,3'-Dichlorobenzidine	BQL	2000	
3-Nitroaniline	BQL	5200	
4,6-Dinitro-2-methylphenol	BQL	5200	
4-Bromophenyl phenyl ether	BQL	1000	
4-Chloro-3-methylphenol	BQL	2000	
4-Chloroaniline	BQL	2000	
4-Chlorophenyl phenyl ether	BQL	1000	
4-Methylphenol	BQL	1000	
4-Nitroaniline	BQL	2000	
4-Nitrophenol	BQL	5200	
Acenaphthene	BQL	1000	
Acenaphthylene	BQL	1000	
Anthracene	263	1000	J
Benzo(a)anthracene	1040	1000	
Benzo(a)pyrene	1630	1000	
Benzo(b)fluoranthene	4890	1000	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8270
Units: ug/Kg

Analyst: FP
Analyzed: 06/05/92
Extracted: 06/02/92

SEMIVOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
Benzo(g,h,i)perylene	1150	1000	
Benzo(k)fluoranthene	BQL	1000	
Benzoic acid	7160	5200	
Benzyl alcohol	BQL	2000	
Butyl benzyl phthalate	BQL	1000	
Chrysene	1840	1000	
Di-n-butylphthalate	BQL	1000	
Di-n-octylphthalate	BQL	1000	
Dibenz(a,h)anthracene	BQL	1000	
Dibenzofuran	BQL	1000	
Diethylphthalate	BQL	1000	
Dimethyl phthalate	BQL	1000	
Fluoranthene	1800	1000	
Fluorene	151	1000	J
Hexachlorobenzene	1250	1000	
Hexachlorobutadiene	BQL	1000	
Hexachlorocyclopentadiene	BQL	1000	
Hexachloroethane	5100	1000	
Indeno(1,2,3-cd)pyrene	1160	1000	
Isophorone	BQL	1000	
N-Nitroso-di-n-dipropylamine	BQL	1000	
N-nitrosodiphenylamine	2760	1000	
Naphthalene	BQL	1000	
Nitrobenzene	BQL	1000	
Pentachlorophenol	BQL	5200	
Phenanthrene	937	1000	J
Phenol	BQL	1000	
Pyrene	3600	1000	
bis(2-Chloroethoxy) methane	BQL	1000	
bis(2-Chloroethyl) ether	BQL	1000	
bis(2-Chloroisopropyl) ether	BQL	1000	
bis(2-Ethylhexyl)phthalate	1080	1000	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8270
Units: ug/Kg
SEMIVOLATILE TARGET COMPOUNDS

Analyst: PP
Analyzed: 06/05/92
Extracted: 06/02/92

Parameter	Result	Det.Lim.	Qualifier
Benzo(g,h,i)perylene	1150	1000	
Benzo(k)fluoranthene	BQL	1000	
Benzoic acid	7160	5200	
Benzyl alcohol	BQL	2000	
Butyl benzyl phthalate	BQL	1000	
Chrysene	1840	1000	
Di-n-butylphthalate	BQL	1000	
Di-n-octylphthalate	BQL	1000	
Dibenz(a,h)anthracene	BQL	1000	
Dibenzofuran	BQL	1000	
Diethylphthalate	BQL	1000	
Dimethyl phthalate	BQL	1000	
Fluoranthene	1800	1000	
Fluorene	151	1000	J
Hexachlorobenzene	1250	1000	
Hexachlorobutadiene	BQL	1000	
Hexachlorocyclopentadiene	BQL	1000	
Hexachloroethane	5100	1000	
Indeno(1,2,3-cd)pyrene	1160	1000	
Isophorone	BQL	1000	
N-Nitroso-di-n-dipropylamine	BQL	1000	
N-nitrosodiphenylamine	2760	1000	
Naphthalene	BQL	1000	
Nitrobenzene	BQL	1000	
Pentachlorophenol	BQL	5200	
Phenanthrene	937	1000	J
Phenol	BQL	1000	
Pyrene	3600	1000	
bis(2-Chloroethoxy) methane	BQL	1000	
bis(2-Chloroethyl) ether	BQL	1000	
bis(2-Chloroisopropyl) ether	BQL	1000	
bis(2-Ethylhexyl)phthalate	1080	1000	

Notes and definitions for this report:
BQL = Below Quantitation Limit
J = An estimated value, below method detection limit

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02C
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8240s
Units: ug/Kg

Analyst: DR
Analyzed: 05/27/92

VOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,1,1-Trichloroethane	BQL	16	
1,1,2,2-Tetrachloroethane	BQL	16	
1,1,2-Trichloroethane	BQL	16	
1,1-Dichloroethane	BQL	16	
1,1-Dichloroethene	BQL	16	
1,2-Dichloroethane	BQL	16	
1,2-Dichloropropane	BQL	16	
2-Butanone	39.8	310	J
2-Chloroethylvinyl ether	BQL	31	
2-Hexanone	BQL	160	
4-Methyl-2-pentanone	BQL	160	
Acetone	189	310	BJ
Benzene	BQL	16	
Bromodichloromethane	BQL	16	
Bromoform	BQL	16	
Bromomethane	BQL	31	
Carbon Disulfide	7.86	310	J
Carbon Tetrachloride	BQL	16	
Chlorobenzene	BQL	16	
Chlorodibromomethane	BQL	16	
Chloroethane	BQL	31	
Chloroform	3.13	16	J
Chloromethane	BQL	31	
Ethylbenzene	BQL	16	
Methylene Chloride	35	16	B
Styrene	3.82	16	J
Tetrachloroethene	91.0	16	
Toluene	BQL	16	
Trichloroethene	3.35	16	J
Vinyl Acetate	BQL	160	
Vinyl Chloride	BQL	31	
Xylene	BQL	16	
cis-1,3-Dichloropropene	BQL	16	
trans-1,2-Dichloroethene	BQL	16	
trans-1,3-Dichloropropene	BQL	16	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

B = Compound found in associated method blank

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9205187-02C
Client ID: 326-2141-E2370S
Collected: 05/20/92
Dilution: 1

Matrix: SEDIMENT
Method: 8240s
Units: ug/Kg

Analyst: DR
Analyzed: 05/27/92

VOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,1,1-Trichloroethane	BQL	16	
1,1,2,2-Tetrachloroethane	BQL	16	
1,1,2-Trichloroethane	BQL	16	
1,1-Dichloroethane	BQL	16	
1,1-Dichloroethene	BQL	16	
1,2-Dichloroethane	BQL	16	
1,2-Dichloropropane	BQL	16	
2-Butanone	39.8	310	J
2-Chloroethylvinyl ether	BQL	31	
2-Hexanone	BQL	160	
4-Methyl-2-pentanone	BQL	160	
Acetone	189	310	BJ
Benzene	BQL	16	
Bromodichloromethane	BQL	16	
Bromoform	BQL	16	
Bromomethane	BQL	31	
Carbon Disulfide	7.86	310	J
Carbon Tetrachloride	BQL	16	
Chlorobenzene	BQL	16	
Chlorodibromomethane	BQL	16	
Chloroethane	BQL	31	
Chloroform	3.13	16	J
Chloromethane	BQL	31	
Ethylbenzene	BQL	16	
Methylene Chloride	35	16	B
Styrene	3.82	16	J
Tetrachloroethene	91.0	16	
Toluene	BQL	16	
Trichloroethene	3.35	16	J
Vinyl Acetate	BQL	160	
Vinyl Chloride	BQL	31	
Xylene	BQL	16	
cis-1,3-Dichloropropene	BQL	16	
trans-1,2-Dichloroethene	BQL	16	
trans-1,3-Dichloropropene	BQL	16	

Notes and definitions for this report:

BQL = Below Quantitation Limit

J = An estimated value, below method detection limit

B = Compound found in associated method blank

GP ENVIRONMENTAL SERVICES
METALS ANALYSIS RESULTS

Matrix: WATER
Collected: 05/20/92

GP ID: 9205187-016
Client ID: 325-2141-E2370W

	Element	Method	Result	Det.Lim.	Units	Dil.	Digested	Analyzed by	
	Aluminum	MCAWW 200.7	5070	153	ug/L	1	05/28/92	MB	06/02/92
100	Barium	MCAWW 200.7	256	19.1	ug/L	1	05/28/92	MB	06/02/92
	Beryllium	MCAWW 200.7	BQL	0.800	ug/L	1	05/28/92	MB	06/02/92
1	Cadmium	MCAWW 200.7	8.00	2.40	ug/L	1	05/28/92	MB	06/02/92
	Calcium	MCAWW 200.7	1510000	1830	ug/L	20	05/28/92	MB	06/02/92
5.0	Chromium	MCAWW 200.7	26.6	9.10	ug/L	1	05/28/92	MB	06/02/92
	Cobalt	MCAWW 200.7	BQL	22.5	ug/L	1	05/28/92	MB	06/02/92
	Copper	MCAWW 200.7	68.7	17.2	ug/L	1	05/28/92	MB	06/02/92
	Iron	MCAWW 200.7	49500	670	ug/L	20	05/28/92	MB	06/02/92
	Magnesium	MCAWW 200.7	15700	58.0	ug/L	1	05/28/92	MB	06/02/92
	Manganese	MCAWW 200.7	145	5.20	ug/L	1	05/28/92	MB	06/02/92
	Nickel	MCAWW 200.7	61.5	28.9	ug/L	1	05/28/92	MB	06/02/92
	Vanadium	MCAWW 200.7	BQL	22.5	ug/L	1	05/28/92	MB	06/02/92
	Zinc	MCAWW 200.7	1350	6.50	ug/L	1	05/28/92	MB	06/02/92
	Antimony	MCAWW 204.2	BQL	15.9	ug/L	1	06/01/92	MG	06/01/92
5	Arsenic	MCAWW 206.2	815	185	ug/L	1	05/28/92	TES	06/02/92
5.0	Lead	MCAWW 239.2	1020	46.0	ug/L	1	05/28/92	TES	06/02/92
0.2	Mercury	MCAWW 245.1	BQL	0.200	ug/L	1	05/27/92	MP	05/27/92
	Potassium	MCAWW 258.1	337	3.00	mg/L	1	05/28/92	TES	06/03/92
	Selenium	MCAWW 270.2	BQL	4.30	ug/L	1	05/28/92	TES	06/02/92
	Silver	MCAWW 272.2	BQL	0.800	ug/L	1	05/28/92	TES	06/02/92
	Sodium	MCAWW 273.1	261	1.90	mg/L	1	05/28/92	TES	06/03/92
	Thallium	MCAWW 279.2	BQL	3.60	ug/L	1	05/28/92	SB	06/01/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
METALS ANALYSIS RESULTS

GP ID: 9205187-016
Client ID: 325-2141-E2370W

Matrix: WATER
Collected: 05/20/92

Element	Method	Result	Det.Lim.	Units	Dil.	Digested	Analyzed by	
Aluminum	MCAWW 200.7	5070	153	ug/L	1	05/28/92	MB	06/02/92
Barium	MCAWW 200.7	256	19.1	ug/L	1	05/28/92	MB	06/02/92
Beryllium	MCAWW 200.7	BQL	0.800	ug/L	1	05/28/92	MB	06/02/92
Cadmium	MCAWW 200.7	8.00	2.40	ug/L	1	05/28/92	MB	06/02/92
Calcium	MCAWW 200.7	1510000	1830	ug/L	20	05/28/92	MB	06/02/92
Chromium	MCAWW 200.7	26.6	9.10	ug/L	1	05/28/92	MB	06/02/92
Cobalt	MCAWW 200.7	BQL	22.5	ug/L	1	05/28/92	MB	06/02/92
Copper	MCAWW 200.7	68.7	17.2	ug/L	1	05/28/92	MB	06/02/92
Iron	MCAWW 200.7	49500	670	ug/L	20	05/28/92	MB	06/02/92
Magnesium	MCAWW 200.7	15700	58.0	ug/L	1	05/28/92	MB	06/02/92
Manganese	MCAWW 200.7	145	5.20	ug/L	1	05/28/92	MB	06/02/92
Nickel	MCAWW 200.7	61.5	28.9	ug/L	1	05/28/92	MB	06/02/92
Vanadium	MCAWW 200.7	BQL	22.5	ug/L	1	05/28/92	MB	06/02/92
Zinc	MCAWW 200.7	1350	6.50	ug/L	1	05/28/92	MB	06/02/92
Antimony	MCAWW 204.2	BQL	15.9	ug/L	1	06/01/92	MG	06/01/92
Arsenic	MCAWW 206.2	815	185	ug/L	1	05/28/92	TES	06/02/92
Lead	MCAWW 239.2	1020	46.0	ug/L	1	05/28/92	TES	06/02/92
Mercury	MCAWW 245.1	BQL	0.200	ug/L	1	05/27/92	MP	05/27/92
Potassium	MCAWW 258.1	337	3.00	mg/L	1	05/28/92	TES	06/03/92
Selenium	MCAWW 270.2	BQL	4.30	ug/L	1	05/28/92	TES	06/02/92
Silver	MCAWW 272.2	BQL	0.800	ug/L	1	05/28/92	TES	06/02/92
Sodium	MCAWW 273.1	261	1.90	mg/L	1	05/28/92	TES	06/03/92
Thallium	MCAWW 279.2	BQL	3.60	ug/L	1	05/28/92	SB	06/01/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
METALS ANALYSIS RESULTS

Matrix: SEDIMENT
Collected: 05/20/92

GP ID: 9205187-02A
Client ID: 326-2141-E2370S

Element	Method	Result	Det.Lim.	Units	Dil.	Digested	Analyzed by	
Aluminum	HCAWW 200.7	12700	96.3	mg/Kg	1	05/28/92	MB	06/02/92
Barium	HCAWW 200.7	573	12.0	mg/Kg	1	05/28/92	MB	06/02/92
Beryllium	HCAWW 200.7	BQL	0.500	mg/Kg	1	05/28/92	MB	06/02/92
Cadmium	HCAWW 200.7	4.09	1.50	mg/Kg	1	05/28/92	MB	06/02/92
Calcium	HCAWW 200.7	17900	83.1	mg/Kg	1	05/28/92	MB	06/02/92
Chromium	HCAWW 200.7	183	5.70	mg/Kg	1	05/28/92	MB	06/02/92
Cobalt	HCAWW 200.7	14.3	14.2	mg/Kg	1	05/28/92	MB	06/02/92
Copper	HCAWW 200.7	411	10.8	mg/Kg	1	05/28/92	MB	06/03/92
Iron	HCAWW 200.7	161000	21.1	mg/Kg	20	05/28/92	MB	06/02/92
Magnesium	HCAWW 200.7	1660	36.5	mg/Kg	1	05/28/92	MB	06/02/92
Manganese	HCAWW 200.7	387	3.30	mg/Kg	1	05/28/92	MB	06/02/92
Nickel	HCAWW 200.7	68.0	18.2	mg/Kg	1	05/28/92	MB	06/02/92
Vanadium	HCAWW 200.7	88.0	14.2	mg/Kg	1	05/28/92	MB	06/02/92
Zinc	HCAWW 200.7	3290	4.10	mg/Kg	1	05/28/92	MB	06/02/92
Antimony	HCAWW 204.2	BQL	10.0	mg/Kg	1	05/28/92	MB	06/01/92
Arsenic	HCAWW 206.2	1370	116	mg/Kg	1	05/28/92	TES	06/02/92
Lead	HCAWW 239.2	25000	1450	mg/Kg	1	05/28/92	TES	06/02/92
Mercury	HCAWW 245.5	0.670	0.300	mg/Kg	1	06/02/92	SB	06/02/92
Potassium	HCAWW 258.1	3420	189	mg/Kg	1	05/28/92	TES	06/03/92
Selenium	HCAWW 270.2	BQL	2.71	mg/Kg	1	05/28/92	TES	06/02/92
Silver	HCAWW 272.2	1.13	0.503	mg/Kg	1	05/28/92	TES	06/02/92
Sodium	HCAWW 273.1	335	120	mg/kg	1	05/28/92	TES	06/03/92
Thallium	HCAWW 279.2	BQL	2.26	mg/Kg	1	05/28/92	SB	06/01/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
METALS ANALYSIS RESULTS

GP ID: 9205187-02A
Client ID: 326-2141-E2370S

Matrix: SEDIMENT
Collected: 05/20/92

Element	Method	Result	Det.Lim.	Units	Dil.	Digested	Analyzed by	
Aluminum	MCAWW 200.7	12700	96.3	mg/Kg	1	05/28/92	MB	06/02/92
Barium	MCAWW 200.7	573	12.0	mg/Kg	1	05/28/92	MB	06/02/92
Beryllium	MCAWW 200.7	BQL	0.500	mg/Kg	1	05/28/92	MB	06/02/92
Cadmium	MCAWW 200.7	4.09	1.50	mg/Kg	1	05/28/92	MB	06/02/92
Calcium	MCAWW 200.7	17900	83.1	mg/Kg	1	05/28/92	MB	06/02/92
Chromium	MCAWW 200.7	183	5.70	mg/Kg	1	05/28/92	MB	06/02/92
Cobalt	MCAWW 200.7	14.3	14.2	mg/Kg	1	05/28/92	MB	06/02/92
Copper	MCAWW 200.7	411	10.8	mg/Kg	1	05/28/92	MB	06/03/92
Iron	MCAWW 200.7	161000	21.1	mg/Kg	20	05/28/92	MB	06/02/92
Magnesium	MCAWW 200.7	1660	36.5	mg/Kg	1	05/28/92	MB	06/02/92
Manganese	MCAWW 200.7	387	3.30	mg/Kg	1	05/28/92	MB	06/02/92
Nickel	MCAWW 200.7	68.0	18.2	mg/Kg	1	05/28/92	MB	06/02/92
Vanadium	MCAWW 200.7	88.0	14.2	mg/Kg	1	05/28/92	MB	06/02/92
Zinc	MCAWW 200.7	3290	4.10	mg/Kg	1	05/28/92	MB	06/02/92
Antimony	MCAWW 206.2	BQL	10.0	mg/Kg	1	05/28/92	MG	06/01/92
Arsenic	MCAWW 206.2	1370	116	mg/Kg	1	05/28/92	TES	06/02/92
Lead	MCAWW 239.2	25000	1450	mg/Kg	1	05/28/92	TES	06/02/92
Mercury	MCAWW 245.5	0.670	0.300	mg/Kg	1	06/02/92	SB	06/02/92
Potassium	MCAWW 258.1	3420	189	mg/Kg	1	05/28/92	TES	06/03/92
Selenium	MCAWW 270.2	BQL	2.71	mg/Kg	1	05/28/92	TES	06/02/92
Silver	MCAWW 272.2	1.13	0.503	mg/Kg	1	05/28/92	TES	06/02/92
Sodium	MCAWW 273.1	335	120	mg/kg	1	05/28/92	TES	06/03/92
Thallium	MCAWW 279.2	BQL	2.26	mg/Kg	1	05/28/92	SB	06/01/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9205187-01W
Client ID: 325-2141-E2370W

Collected: 05/20/92
Matrix: WATER

Parameter	Method	Result	Det.Lim.	Units	Dil.	Analyzed by	
Total Cyanide	SOW390/335.2	BQL	10.0	ug/L	1	VHM	05/31/92

GP ID: 9205187-02A
Client ID: 326-2141-E2370S

Collected: 05/20/92
Matrix: SEDIMENT

Parameter	Method	Result	Det.Lim.	Units	Dil.	Analyzed by	
Percent Solids	MCAWW 160.3	31.8		%		CS	05/28/92
Total Cyanide	SOW390/335.2	11.9	6.29	mg/Kg	1	VHM	05/31/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9205187-01W
Client ID: 325-2141-E2370W

Collected: 05/20/92
Matrix: WATER

Parameter	Method	Result	Det.Lim.	Units	Dil.	Analyzed by	
Total Cyanide	SOW390/335.2	BQL	10.0	ug/L	1	VMM	05/31/92

GP ID: 9205187-02A
Client ID: 326-2141-E2370S

Collected: 05/20/92
Matrix: SEDIMENT

Parameter	Method	Result	Det.Lim.	Units	Dil.	Analyzed by	
Percent Solids	MCAWW 160.3	31.8		%		CS	05/28/92
Total Cyanide	SOW390/335.2	11.9	6.29	mg/Kg	1	VMM	05/31/92

Notes and definitions for this report:
BQL = Below Quantitation Limit

GP ENVIRONMENTAL SERVICES
RADIOLOGICAL RESULTS

GP ID: 9205187-01I
Client ID: 325-2141-E2370W
Collected: 05/20/92

Matrix: Water

TARGET COMPOUNDS

Compound	Result (pCi/L)
Gross alpha	200 ± 70
Gross beta	580 ± 40

GP ENVIRONMENTAL SERVICES
RADIOLOGICAL RESULTS

GP ID: 9205187-01I
Client ID: 325-2141-E2370W
Collected: 05/20/92

Matrix: Water

TARGET COMPOUNDS

Compound	Result (pCi/L)
Gross alpha	200 ± 70
Gross beta	580 ± 40

GP ENVIRONMENTAL SERVICES
RADIOLOGICAL RESULTS

GP ID: 9205187-02B
Client ID: 326-2141-E2370S
Collected: 05/20/92

Matrix: Sediment

TARGET COMPOUNDS

Compound	Result (pCi/g)
Gross alpha	12 ± 5
Gross beta	25 ± 3

GP ENVIRONMENTAL SERVICES
RADIOLOGICAL RESULTS

GP ID: 9205187-02B
Client ID: 326-2141-E2370S
Collected: 05/20/92

Matrix: Sediment

TARGET COMPOUNDS

Compound	Result (pCi/g)
Gross alpha	12 ± 5
Gross beta	25 ± 3

GP ENVIRONMENTAL SERVICES
202 Perry Parkway
Gaithersburg, Maryland 20877
(301) 926-6802

CHAIN OF CUSTODY FORM

Sheet 1 of 1

Samplers Signature: Barry D. Adams

Client: ARM-410
US. ARMY APG

Project: E2370
Adamsite Vault

Client Sample ID	Collection Date	Collection Time	Collected By (Initials)	Matrix	Total No. of Containers	TCL - VOA (40 ml glass)	TCL - BNA (1 liter amber glass)	TCL - PEST/PCB (1 liter amber glass)	TAL - METALS (1 liter HDPE)	TAL - Total Cyanide (1 liter HDPE)	Gross Alpha Beta + Radiation (2 1 liter HDPE)	TAL & Gross Beta + Alpha (16 oz. AMBER)			Comments
325-2141-E2370W	5/20	2:50	BDA	WO	13	3	3	3	1	1	2				Sample Bottle labels have only the last
326-2141-E2370S	5/20	3:30	BDA	Sed	4	2						2			6 digits of the samp ID numbers.
															Routine 30 day turn around.
Total					17										Please fax a copy o the completed chain-Custody to Roger Calu

Analyses Requested

4 hrs Sampling

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time
Barry D. Adams	General Physics	5/20/92	5:15			5/20/92	17:
	GP	5/20/92	19:50	M. O'Meeley	GP	5/21/92	8:A

ATTACHMENT 1-3: SUMMARY OF RESULTS SECTION 3 — FROM THE "PRELIMINARY FIELD INVESTIGATION REPORT; SAMPLING OF THE ADAMSITE STORAGE VAULTS AT EDGEWOOD AREA," WESTON, 22 OCTOBER 1993

SECTION 3
SUMMARY OF RESULTS

3.1 SITE HYDROGEOLOGY

The results of drilling activities at the Adamsite storage vaults indicate that the site is underlain by Coastal Plain sediments of Recent Age. Although the shallow sediments appear to have been reworked based on interpretation of the boring logs, sediments below a depth of approximately 6 ft are in natural sequence. Borings were drilled to a maximum depth of 18 ft.

Site lithology consists of fine silts and sands, with some medium to coarse sands. The sediments closest to the Bush River are fine grain silts with apparent low permeability, as indicated by the borehole logs and well development data from MW-3 included in Appendix B of this report. A cross section (fence diagram) of the site lithology is presented in Figure 3-1. This diagram shows the relationship of the former storage vaults to the substrata.

Depth to groundwater ranges from approximately 6 to 7 ft bgs and is probably tidally influenced. In the vicinity of the vaults, groundwater appears to flow from west (MW-1 and MW-2) to east (MW-3) toward the Bush River, as indicated by the water level elevations in the site monitoring wells (see Figure 3-1). The water level elevations shown in Figure 3-1 were calculated from depth to water measurements collected on July 22, 1993. The apparent west to east gradient is based on head differences and is approximated. In addition, permeability differences in the sediments may also control groundwater movement.

3.2 SUMMARY OF ANALYTICAL RESULTS

As discussed in Section 2 of this report, WESTON collected samples from the soils surrounding the vaults at six soil boring/monitoring well installation locations, one groundwater sample from each of the three monitoring wells, one water sample and two sediment samples at the NE vault, two sediment samples at the SW vault, and concrete samples at two discrete intervals at two locations in each vault. The sampling locations are indicated in Figure 3-2. All analytical results for samples collected are included in the tables located at the end of this section and in Appendix E of this report.

The samples were analyzed for CSM, as discussed in Subsection 2.4 of this report. As shown in Table 3-1, all samples screened provided negative responses for Sarin (GB), Soman (GD), O-ethyl S-(2-diisoproplymaminoethyl) -methylphosphonothioate (VX), and mustard (HD).

None of the compounds detected in the concrete chip, the vault sediment, and the vault water met the hazardous waste criteria defined in the Resource Conservation and Recovery Act (RCRA) 40 Code of Federal Regulations (CFR) 261. The analytical data for these samples are presented in Tables 3-2 through 3-4.

Review of the soil boring and monitoring well soil sample data indicated detectable levels of volatiles, pesticides/polychlorinated biphenyls (PCBs), and metals. The following summary indicates the parameter and the location detected above the RCRA Corrective Action Level. The specific analytical data for the soil boring and monitoring well soil samples are indicated in Tables 3-5 and 3-6.

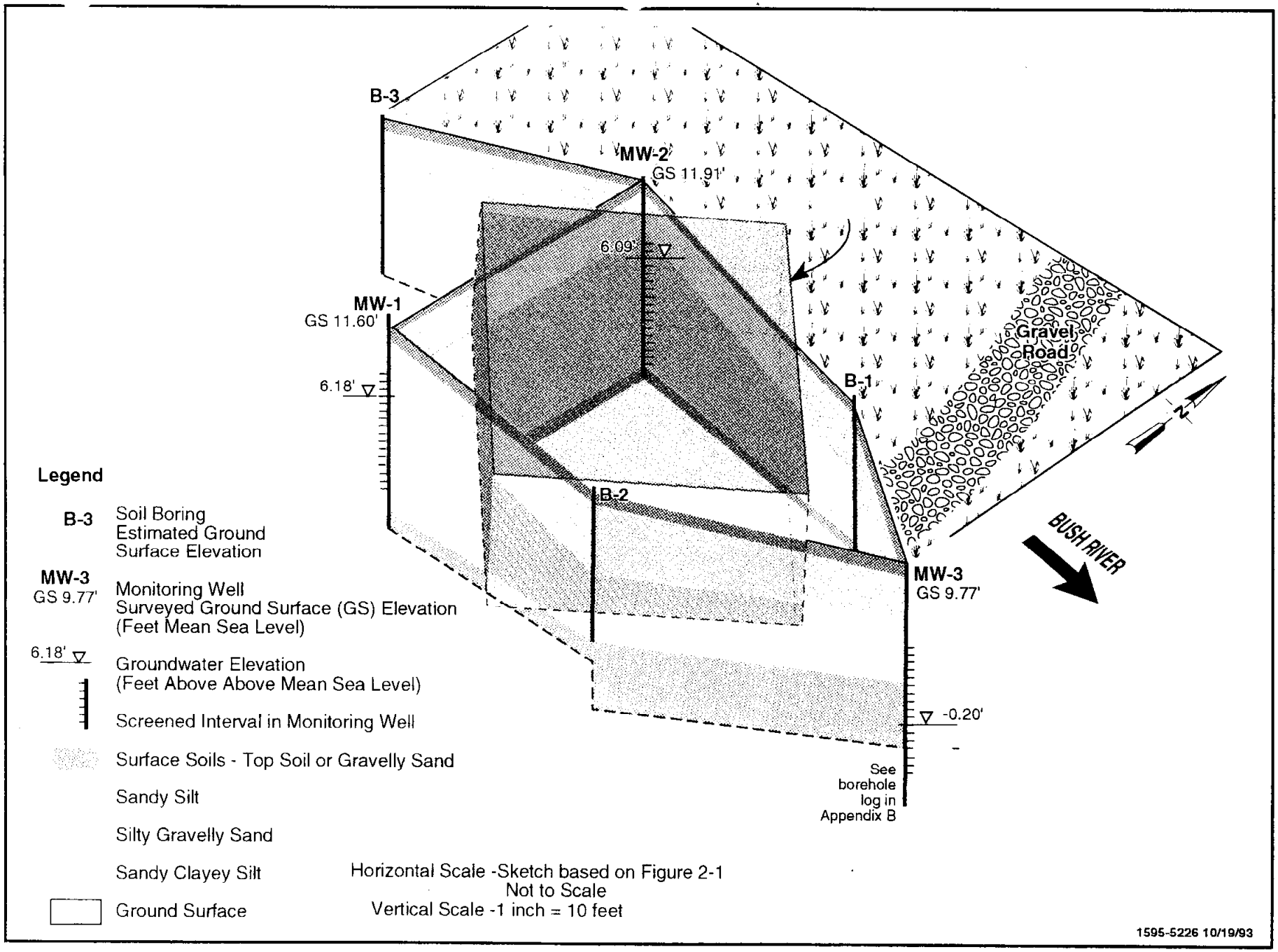


FIGURE 3-1 ADAMSITE VAULT 3-DIMENSIONAL FENCE DIAGRAM

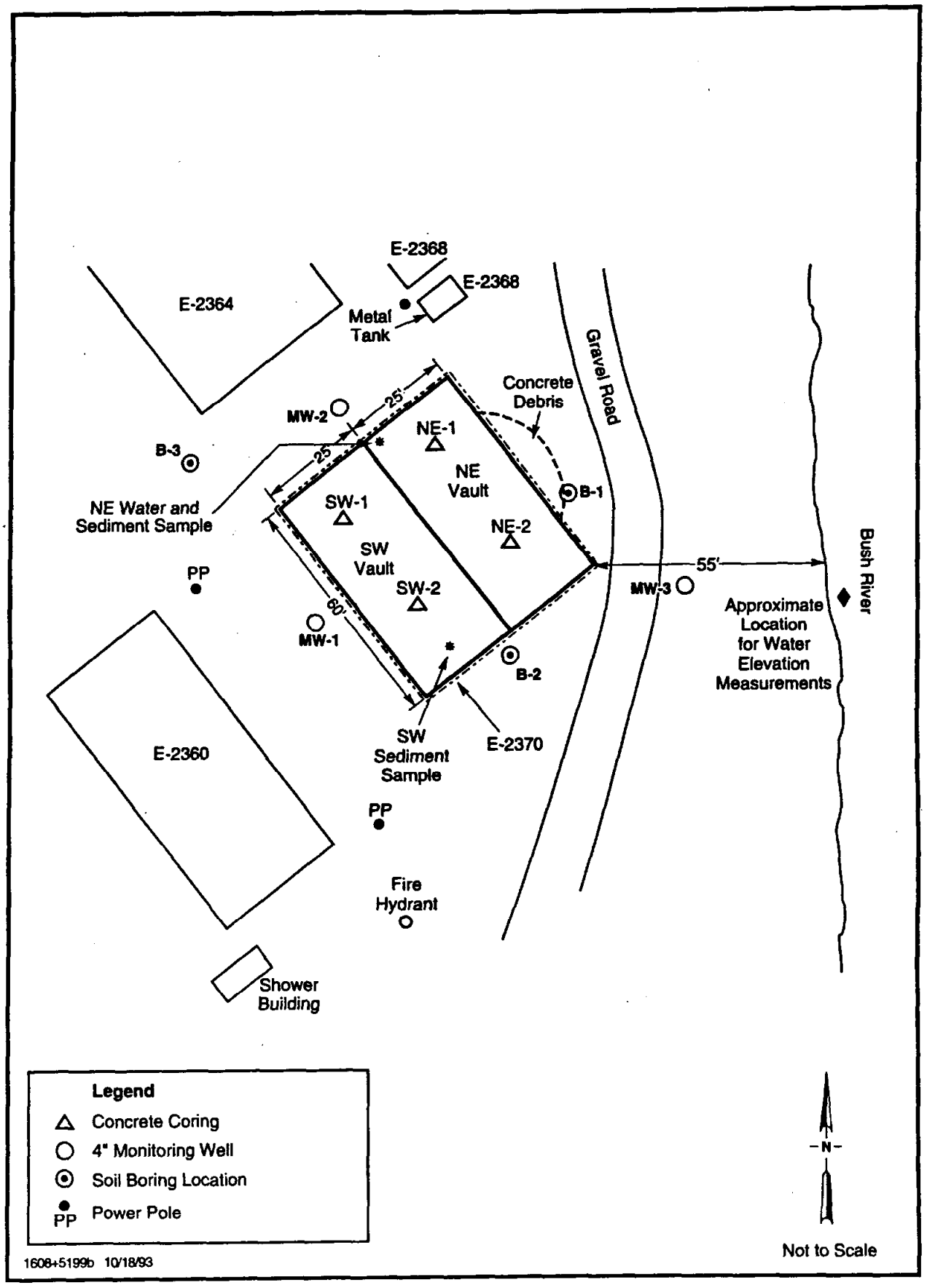


FIGURE 3-2 APPROXIMATE SAMPLING LOCATIONS

Parameter	Soil Sample Location Detected Above RCRA Corrective Action Standard
Aroclor	MW-2-S (0 to 6 inches)
Arsenic	B-2-S (0 to 6 inches)
Beryllium	MW-1-S (0 to 6 inches, 6 inches to 2 ft, and 4 ft to 6 ft)
	MW-2-S (6 inches to 2 ft and 4 ft to 6 ft)
	MW-3-S (0 to 6 inches, 6 inches to 2 ft, 4 ft to 6 ft, 10 ft to 12 ft, and 10 ft to 12 ft DUP)
Mercury	B-3-S (0 to 6 inches, 4 ft to 6 ft, and 10 ft to 12 ft DUP)

Aroclor 1260 was detected above the RCRA Corrective Action Standard in the soil sample collected at MW-2-S (at an interval of 0 to 6 inches). The RCRA Corrective Action Standard for PCBs is 90 mg/kg.

Soil samples collected at MW-1 (at intervals of 0 to 6 inches, 6 inches to 2 ft, and 4 ft to 6 ft), at MW-2 (at intervals of 6 inches to 2 ft and 4 ft to 6 ft), and at all intervals at MW-3 exceeded the RCRA Corrective Action Standard for beryllium. The soil sample collected at soil boring B-2 (at an interval of 0 to 6 inches) exceeded the RCRA Corrective Action Standard for arsenic. The soil sample collected at soil boring B-3 (at intervals of 0 to 6 inches, 4 ft to 6 ft, and 10 ft to 12 ft) exceeded the RCRA Corrective Action Standard for mercury.

The analytical results collected from the groundwater at MW-1, MW-2, and MW-3 indicated detectable levels of volatiles and metals. The following summary indicates the parameters detected above the RCRA Corrective Action Standard for water and the respective monitoring well. The analytical data for the monitoring well groundwater samples are indicated in Table 3-7.

Parameter	Groundwater Sample Location Detected Above the RCRA Corrective Action Standard
Chloroform	MW-1
1,1,2,2-Tetrachloroethane	MW-2 and MW-3
Tetrachloroethane	MW-2 and MW-3
Trichloroethane	MW-2 and MW-3
Beryllium	MW-1
1,1,2-Trichloroethane	MW-2 and MW-3

Chloroform, 1,1,2,2-tetrachloroethane, tetrachloroethane, trichloroethane, 1,1,2-trichloroethane, and beryllium were detected at levels exceeding the RCRA Corrective Action Standard for water.

The analytical results collected from the decontamination water and soil boring/monitoring well drilling tailings indicated levels below those listed in 40 CFR 261 for characterizing RCRA hazardous wastes (see Tables 3-8 and 3-9).

3.2.1 Radiation Characterization

Two water, six sediment, and nine concrete chip samples from the Adamsite vaults were taken and analyzed for radionuclides. In general, no elevated levels of radionuclides were found, although the gross beta activity of the water sample is unusually high. Gross beta activity for the two water samples was 610 pCi/L and 550 pCi/L. These activities can be compared with the criteria contained in the Federal Drinking Water Standards, 40 CFR 141, although these regulations would certainly not apply to the water in the vaults. The regulation states that if the gross beta activity is greater than 50 pCi/L, it should be analyzed for specific radionuclides. This was done for the analyses that were performed for

total uranium, carbon-14, tritium, and a gamma spectrum. The only specific radionuclide that was detected above detection limits was potassium -40 in one sample (299 pCi/L).

Potassium -40 is a naturally occurring radionuclide and a beta emitter, and may be the cause of the elevated gross beta activity.

In the vaults' sediment, the gross beta analysis varied from <3 pCi/g to 10 pCi/g, which is typical for soil. Four radionuclides were detected in the gamma spectrum analysis: beryllium -7 was identified in three samples with a maximum activity of 0.4 pCi/g; potassium -40 was identified in all six samples with a maximum activity of 8 pCi/g; cesium -137 was identified in all six samples with a maximum activity of 0.12 pCi/g; and thorium -228 was identified in three samples with a maximum activity of 0.16 pCi/g.

Potassium -40 and thorium -228 are naturally occurring radionuclides and the concentrations are typical of soil. The report Environmental Radiation Measurements (National Council on Radiation Probation and Measurements (NCRP), Report No. 50, 1976) gave an average activity for potassium -40 of 10 pCi/g and thorium -232 (the parent of thorium -228) of 06 pCi/g. Cesium -137 in these low concentrations is probably fallout from atomic bomb explosions. It has a 30-year half-life and would still exist in the soil (NCRP, Report No. 50). Beryllium -7 is produced in the atmosphere by cosmic rays.

Gross alpha and gross beta analyses were performed on the nine concrete chip samples. No alpha activity was detected, and the beta activity varied from 3.6 pCi/g to 18 pCi/g. These are typical values for soils (NCRP, Report No. 50).

Table 3-1

Results of CSM Screening for Adamsite Vault Soil Samples

Sample ID	Description of Sample Location	Agent Presence Detected At or Above the Given Concentration			
		GB at 20 ppb (ng/g)	GD at 20 ppb (ng/g)	VX at 20 ppb (ng/g)	HD at 200 ppb (ng/g)
A00969	B-1-S (0-6")	negative	negative	negative	negative
A00970	B-1-S (6"-2')	negative	negative	negative	negative
A00971	B-1-S (4-6')	negative	negative	negative	negative
A00972	B-1-S (10-12')	negative	negative	negative	negative
A00973	B-2-S (0-6")	negative	negative	negative	negative
A00974	B-2-S (6"-2')	negative	negative	negative	negative
A00975	B-2-S (4-6')	negative	negative	negative	negative
A00976	B-2-S (10-12')	negative	negative	negative	negative
A00977	B-3-S (0-6")	negative	negative	negative	negative
A00978	B-3-S (6"-2')	negative	negative	negative	negative
A00979	B-3-S (4-6')	negative	negative	negative	negative
A00980	B-3-S (10-12')	negative	negative	negative	negative
A00981	B-3-S (10-12') (DUP)	negative	negative	negative	negative
A00987	MW-2-S (0-6")	negative	negative	negative	negative
A00988	MW-2-S (6"-2')	negative	negative	negative	negative
A00989	MW-2-S (4-6')	negative	negative	negative	negative
A00983	MW-1-S (0-6")	negative	negative	negative	negative
A00990	MW-2-S (10-12')	negative	negative	negative	negative
A00984	MW-1-S (6"-2')	negative	negative	negative	negative
A00985	MW-1-S (4-6')	negative	negative	negative	negative
A00986	MW-1-S (10-12')	negative	negative	negative	negative
A00991	MW-3-S (0-6")	negative	negative	negative	negative

Table 3-1

Results of CSM Screening for Adamsite Vault Soil Samples (Continued)

Sample ID	Description of Sample Location	Agent Presence Detected At or Above the Given Concentration			
		GB at 20 ppb (ng/g)	GD at 20 ppb (ng/g)	VX at 20 ppb (ng/g)	HD at 200 ppb (ng/g)
A00992	MW-3-S (6"-2')	negative	negative	negative	negative
A00993	MW-3-S (4-6')	negative	negative	negative	negative
A00994	MW-3-S (10-12')	negative	negative	negative	negative
A00995	MW-3-S (10-12') (DUP)	negative	negative	negative	negative
01031	NE1-S-0	negative	negative	negative	negative
01030	NE2-S-0	negative	negative	negative	negative
01029	NE2-S-0 (DUP)	negative	negative	negative	negative
01033	SW1-S-0	negative	negative	negative	negative
01026	SW2-S-0	negative	negative	negative	negative
01068	MW-1-W-A	negative	negative	negative	negative
01069	MW-2-W-A	negative	negative	negative	negative
01070	MW-3-W-A	negative	negative	negative	negative
01071	MW-3-W-A (DUP)	negative	negative	negative	negative
01045	NEV-W-A	negative	negative	negative	negative
01046	NEV-W-A (DUP)	negative	negative	negative	negative

Table 3-2

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Concrete Core Samples

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 00954 NE1-C(2-6")	Sample # 00955 NE2-C(0-2")	Sample # 00956 NE2-C(2-6")	Sample # 00957 NE2-C(2-6") (DUP)	Sample # 00820 Trip Blank
TCLP						
Metals						
– Barium (Total)	100,000 ug/L	213 ug/L	88.8 ug/L	104 ug/L	153 ug/L	----
Volatiles	----	ND	ND	ND	ND	ND
Semivolatiles	----	ND	ND	ND	ND	----
Herbicides	----	ND	ND	ND	ND	----
Pesticides	----	ND	ND	ND	ND	----
Reactivity						
– Cyanide (Total; Reactive)	----	ND	ND	ND	ND	----
– Sulfide	----	ND	ND	ND	ND	----
Corrosivity (pH)	< 2 or > 12.5	11.4	11.0	11.3	11.2	----
Ignitibility	----	No flash	No flash	No flash	No flash	----

Table 3-2

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Concrete Core Samples

(Continued)

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 00949 SW1-C(0-2")	Sample # 00950 SW1-C(2-6")	Sample # 00951 SW2-C(0-2")	Sample # 00952 SW2-C(2-6")	Sample # 00953 NE1-C(0-2")	Sample # 00819 Trip Blank
TCLP							Water
Metals							
– Barium (Total)	100,000 ug/L	82.5 ug/L	223 ug/L	103 ug/L	189 ug/L	88.6 ug/L	----
Volatiles	----	ND	ND	ND	ND	ND	ND
Semivolatiles	----	ND	ND	ND	ND	ND	----
Herbicides	----	ND	ND	ND	ND	ND	----
Pesticides	----	ND	ND	ND	ND	ND	----
Reactivity							
– Cyanide (Total; Reactive)	----	ND	ND	ND	ND	ND	----
– Sulfide	----	ND	ND	ND	ND	ND	----
Corrosivity (pH)	< 2 or > 12.5	11.2	11.4	11.3	11.0	11.1	----
Ignitibility	----	No flash	No flash	No flash	No flash	No flash	----

Table 3-3

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Vault Sediment Samples

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 01035 NE2-S-0 (DUP)	Sample # 01036 NE2-S-0	Sample # 01037 NE1-S-0	Sample # 01039 SW2-S-0 (DUP)	Sample # 01040 SW2-S-0	Sample # 01041 SW1-S-0	Sample # TCLP Blank
TCLP								
Metals								
– Lead	5,000 ug/L	ND	275 ug/L	ND	2,790 ug/L	ND	2,060 ug/L	ND
– Barium (Total)	100,000 ug/L	523 ug/L	464 ug/L	310 ug/L	344 ug/L	313 ug/L	318 ug/L	ND
– Arsenic	5,000 ug/L	ND	ND	ND	375 ug/L	381 ug/L	147 ug/L	ND
Volatiles		ND	ND	ND	ND	ND	ND	ND
Semivolatiles	----	ND	ND	ND	ND	ND	ND	ND
Herbicides	----	ND	ND	ND	ND	ND	ND	ND
Pesticides	----	ND	ND	ND	ND	ND	ND	ND
Reactivity								
– Cyanide (Total; Reactive)	----	ND	ND	ND	ND	ND	ND	----
– Sulfide	----	13.1 mg/kg	ND	ND	16 mg/kg	ND	7.15 mg/kg	----
Corrosivity (pH)	< 2 or > 12.5	7.86	7.52	7.26	7.03	7.49	6.97	----
Ignitibility	----	No flash	No flash	No flash	No flash	No flash	No flash	----

Table 3-4

Summary of Toxicity Characteristic Leachate Procedure (TCLP) Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Vault Water

Parameter	RCRA Haz. Waste Char. (40 CFR)	Sample # 00824 Trip Blank	Sample # 00825 Trip Blank	Sample # 01051 NEV-W-A	Sample # 01052 NEV-W-A (DUP)
TCLP					
Metals					
– Barium (Total)	100,000 ug/L	----	----	214	214
Volatiles	----	ND	ND	ND	ND
Semivolatiles	----	----	----	ND	ND
Herbicides	----	----	----	ND	ND
Pesticides	----	----	----	ND	ND
Reactivity					
– Cyanide (Total; Reactive)	----	----	----	ND	ND
– Sulfide	----	----	----	ND	ND
Corrosivity (pH)	<2 or >12.5	----	----	6.9	6.9
Ignitibility	----	----	----	No flash	No flash

Table 3-6

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Monitoring Well Soil Samples
(Continued)

Parameter	RCRA Corrective Action Standards [1]	Sample # 01016 MW2-S(0-6")	Sample # 01017 MW2-S(6"-2')	Sample # 01018 MW2-S(4-6')	Sample 01019 MW2-S(10-12")
TCL ANALYTES					
Volatiles					
– Acetone	8,000,000 ug/Kg	ND	ND	ND	ND
– Trichloroethene	60,000 ug/Kg	8.48 ug/Kg	ND	ND	ND
– 1,1,2,2-Tetrachloroethane	40,000 ug/Kg	ND	14.0 ug/Kg	11.0 ug/Kg	ND
– Xylene	2E+8 ug/Kg	ND	14.2 ug/Kg	ND	ND
Pesticides/PCBs					
– 4,4' DDE	2,000 ug/Kg	ND	ND	ND	ND
– 4,4' DDT	2,000 ug/Kg	ND	ND	ND	ND
– Aroclor 1260	90 ug/Kg	1,590 ug/Kg	ND	ND	ND
Semivolatiles (BNA)	----	ND	ND	ND	ND
TAL ANALYTES					
Metals					
– Arsenic	80 mg/Kg	7.70 mg/Kg	4.3 mg/Kg	4.3 mg/Kg	ND
– Lead	No proposed level	120 mg/Kg	11.1 mg/Kg	8.3 mg/Kg	4.40 mg/Kg
– Potassium	----	533 mg/Kg	660.0 mg/Kg	991 mg/Kg	270 mg/Kg
– Silver	200 mg/Kg	0.158 mg/Kg	ND	ND	ND
– Sodium	----	135 mg/Kg	75.1 mg/Kg	119 mg/Kg	ND
– Aluminum	----	6,070 mg/Kg	15,000 mg/Kg	15,900 mg/Kg	3,520 mg/Kg
– Barium	----	50.9 mg/Kg	51.5 mg/Kg	36.4 mg/Kg	10.2 mg/Kg
– Beryllium	0.2 mg/Kg	0.180 mg/Kg	0.520 mg/Kg	0.560 mg/Kg	ND
– Cadmium	40 mg/Kg	2.40 mg/Kg	ND	ND	ND
– Calcium	----	2,450 mg/Kg	301 mg/Kg	469 mg/Kg	134 mg/Kg
– Cobalt	----	7.0 mg/Kg	5.9 mg/Kg	3.9 mg/Kg	ND
– Chromium	400 mg/Kg	27.6 mg/Kg	17.8 mg/Kg	22 mg/Kg	4.20 mg/Kg
– Copper	----	31.6 mg/Kg	6.9 mg/Kg	12.1 mg/kg	ND
– Iron	----	23,500 mg/Kg	15,800 mg/Kg	19,000 mg/kg	2,190 mg/Kg
– Magnesium	----	2,560 mg/Kg	1,260 mg/Kg	1,930 mg/Kg	325 mg/Kg
– Manganese	----	98.0 mg/Kg	65.1 mg/Kg	65.6 mg/Kg	24.7 mg/Kg
– Nickel	2,000 mg/Kg	24.6 mg/Kg	12.0 mg/Kg	11.1 mg/Kg	4.60 mg/Kg
– Vanadium	----	14.2 mg/Kg	26.3 mg/Kg	36.4 mg/Kg	4.50 mg/Kg
– Zinc	----	71.8 mg/Kg	34.0 mg/Kg	32.1 mg/Kg	8.90 mg/Kg

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

Table 3-5

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Soil Boring Samples
(Continued)

Parameter	RCRA Corrective Action Standards [1]	Sample # 01004 B2-S(4-6')	Sample # 01005 B2-S(10-12')	Sample # 01084 Trip Blank	Sample # 01085 Trip Blank
TCL ANALYTES					
Volatiles	----	ND	ND	ND	ND
Pesticides/PCBs	----	ND	ND	----	----
Semivolatiles (BNA)	----	ND	ND	----	----
TAL ANALYTES					
Metals				----	----
– Arsenic	80 mg/Kg	3.46 mg/Kg	1.48 mg/Kg		
– Lead	No proposed level	9.62 mg/Kg	8.56 mg/Kg		
– Mercury	20.0 mg/Kg	ND	ND		
– Potassium	----	658 mg/Kg	583 mg/Kg		
– Sodium	----	69.5 mg/Kg	113 mg/Kg		
– Aluminum	----	118 mg/Kg	60.7 mg/Kg		
– Barium	----	0.284 mg/Kg	0.273 mg/Kg		
– Beryllium	0.2 mg/Kg	0.003 mg/Kg	0.003 mg/Kg		
– Calcium	----	3.77 mg/Kg	4.18 mg/Kg		
– Cobalt	----	0.044 mg/Kg	0.037 mg/Kg		
– Chromium	400 mg/Kg	0.154 mg/Kg	0.197 mg/Kg		
– Copper	----	0.107 mg/Kg	0.087 mg/Kg		
– Iron	----	170 mg/Kg	31.3 mg/Kg		
– Magnesium	----	14.0 mg/Kg	7.91 mg/Kg		
– Manganese	----	0.550 mg/Kg	0.232 mg/Kg		
– Nickel	2,000 mg/Kg	0.039 mg/Kg	ND		
– Vanadium	----	0.271 mg/Kg	0.184 mg/Kg		
– Zinc	----	0.232 mg/Kg	0.191 mg/Kg		

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

Table 3-6

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Monitoring Well Soil Samples
(Continued)

Parameter	RCRA Corrective Action Standards [1]	Sample # 01022 MW3-S(4-6')	Sample # 01023 MW3-S(10-12')	Sample # 01024 MW3-S(10-12')	Sample # 01079 Field Blank
TCL ANALYTES					
Volatiles					
– Acetone	8,000,000 ug/Kg	36.6 ug/Kg	342 ug/Kg	903 ug/Kg	14.1 ug/L
– Methylene Chloride	90,000 ug/Kg	10.1 ug/Kg	6.10 ug/Kg	ND	ND
Pesticides/PCBs	----	ND	ND	ND	ND
Semivolatiles (BNA)	----	ND	ND	ND	ND

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

Table 3-6

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Monitoring Well Soil Samples

Parameter	RCRA Corrective Action Standards [1]	Sample # 00809 Trip Blank	Sample # 00810 Trip Blank	Sample # 01012 MW1-S (0-6")	Sample # 01013 MW1-S (6"-2')	Sample # 01014 MW1-S (4-6')	Sample # 01015 MW1-S (10-12')
TCL ANALYTES							
Volatiles							
– Acetone	8,000,000 ug/Kg	ND	ND	ND	ND	ND	ND
– Methylene Chloride	90,000 ug/Kg	ND	ND	ND	ND	ND	ND
Pesticides/PCBs							
– 4,4' DDE	2,000 ug/Kg	----	----	3.82 ug/Kg	ND	ND	ND
– 4,4' DDT	2,000 ug/Kg	----	----	6.39 ug/Kg	ND	ND	ND
Semivolatiles (BNA)	----	----	----	ND	ND	ND	ND
TAL ANALYTES							
Metals		----	----				
– Arsenic	80 mg/Kg			7.50 mg/Kg	9.40 mg/Kg	2.70 mg/Kg	ND
– Lead	No proposed level			46.2 mg/Kg	10.6 mg/Kg	7.30 mg/Kg	2.10 mg/Kg
– Potassium	----			442 mg/Kg	705 mg/Kg	555 mg/Kg	186 mg/Kg
– Silver	200 mg/Kg			0.290 mg/Kg	ND	ND	ND
– Sodium	----			138 mg/Kg	255 mg/Kg	46.3 mg/Kg	ND
– Aluminum	----			8,460 mg/Kg	16,400 mg/Kg	10,600 mg/Kg	1,940 mg/Kg
– Barium	----			53.7 mg/Kg	42.8 mg/Kg	30.6 mg/Kg	7.20 mg/Kg
– Beryllium	0.2 mg/Kg			0.23 mg/Kg	0.450 mg/Kg	0.34 mg/Kg	ND
– Calcium	----			2,580 mg/Kg	851 mg/Kg	210 mg/Kg	75.1 mg/Kg
– Cobalt	----			13.1 mg/Kg	5.7 mg/Kg	3.90 mg/Kg	ND
– Chromium	400 mg/Kg			40.9 mg/Kg	20.3 mg/Kg	12.3 mg/Kg	2.60 mg/Kg
– Copper	----			25.3 mg/Kg	9.20 mg/Kg	7.80 mg/Kg	ND
– Iron	----			13,900 mg/Kg	19,200 mg/Kg	9,850 mg/Kg	2,260 mg/Kg
– Magnesium	----			15,200 mg/Kg	1,840 mg/Kg	1,370 mg/Kg	258 mg/Kg
– Manganese	----			210 mg/Kg	79.2 mg/Kg	59.4 mg/Kg	12.8 mg/Kg
– Nickel	2,000 mg/Kg			315 mg/Kg	13.1 mg/Kg	8.3 mg/Kg	ND
– Vanadium	----			16.5 mg/Kg	30.7 mg/Kg	20.1 mg/Kg	ND
– Zinc	----			51.9 mg/Kg	42.2 mg/Kg	28.1 mg/Kg	5.70 mg/Kg

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

Table 3-7

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Monitoring Well Groundwater Samples

Parameter	RCRA Corrective Action Standards [1]	Sample # 01073 MW-1-W-A	Sample # 01074 MW-2-W-A	Sample # 01075 MW-3-W-A	Sample # 01076 MW-3-W-A(DUP)	Sample # 00840 Trip Blank	Sample # 00841 Trip Blank
TCL ANALYTES							
Volatiles							
-Chloroform	6.0 ug/L	7.56 ug/L	ND	ND	ND	ND	ND
-Methylene Chloride	5.0 ug/L	ND	ND	ND	ND	ND	ND
-1,1,2,2 Tetrachloroethane	2.0 ug/L	ND	82.7 ug/L	213 ug/L	236 ug/L	ND	ND
-Tetrachloroethene	0.7 ug/L	ND	6.25 ug/L	12.2 ug/L	12.4 ug/L	ND	ND
-Trichloroethene	5.0 ug/L	ND	46.8 ug/L	153 ug/L	151 ug/L	ND	ND
-1,1,2 Trichloroethane	6.0 ug/L	ND	6.04 ug/L	18.1 ug/L	16.8 ug/L	ND	ND
-Trans 1,2 Dichloroethene	----	ND	ND	78.9 ug/L	76.2 ug/L	ND	ND
Pesticides/PCBs	----	ND	ND	ND	ND	----	----
Semivolatiles (BNA)	----	ND	ND	ND	ND	----	----
TAL ANALYTES							
Metals						----	----
-Lead	50.0 ug/L	25.4 ug/L	21.0 ug/L	20.5 ug/L	24.9 ug/L		
-Potassium	----	1,740 ug/L	1,610 ug/L	520 ug/L	2,150 ug/L		
-Sodium	----	8,190 ug/L	2,790 ug/L	3,610 ug/L	34,900 ug/L		
-Aluminum	----	11,800 ug/L	9,180 ug/L	418 ug/L	519 ug/L		
-Barium	----	84.4 ug/L	61.8 ug/L	52 ug/L	49.6 ug/L		
-Beryllium	0.008 ug/L	0.869 ug/L	ND	ND	ND		
-Calcium	----	9,050 ug/L	18,200 ug/L	13,400 ug/L	12,800 ug/L		
-Cobalt	----	10.1 ug/L	ND	28.9 ug/L	27.9 ug/L		
-Chromium	50.0 ug/L	30.7 ug/L	19.8 ug/L	8.64 ug/L	9.48 ug/L		
-Iron	----	21,800 ug/L	9,060 ug/L	2,810 ug/L	3,010 ug/L		
-Magnesium	----	6,340 ug/L	8,540 ug/L	5,750 ug/L	5,350 ug/L		
-Manganese	----	208 ug/L	182 ug/L	340 ug/L	323 ug/L		
- Mercury	2.0 ug/L	0.420 ug/L	ND	ND	ND		
- Nickel	700 ug/L	ND	ND	20.2 ug/L	29.6 ug/L		
-Vanadium	----	34.2 ug/L	15.7 ug/L	ND	ND		
-Zinc	----	83.6 ug/L	42.2 ug/L	58.0 ug/L	54.5 ug/L		

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

Table 3-6

Summary of Analytical Results

Aberdeen Proving Ground

Adamsite Storage Vaults
Delivery Order No. 10
Monitoring Well Soil Samples
(Continued)

Parameter	RCRA Corrective Action Standards [1]	Sample #01020 MW3-S(0-6")	Sample #01021 MW3-S(6"-2')	Sample #00807 Trip Blank	Sample #00808 Trip Blank	
TCL ANALYTES						
Volatiles						
– Acetone	80,000 ug/Kg	ND	ND	13.1 ug/L	15.5 ug/L	
Pesticides/PCBs	----	ND	ND	----	----	
Semivolatiles (BNA)	----	ND	ND	----	----	

Table 3-6 Cont'd: Summary of Metals Analytical Results

Parameter	RCRA Corrective Action Standards [1]	Sample #01020 MW3-S(0-6") (mg/Kg)	Sample #01021 MW3-S(6"-2') (mg/Kg)	Sample #01022 MW3-S(4-6') (mg/Kg)	Sample #01023 MW3-S(10-12') (mg/Kg)	Sample #01024 MW3-S(10-12') (mg/Kg) (DUP)	Sample #01079 Field Blank (mg/Kg)
TAL ANALYTES							
Metals							
– Arsenic	80 mg/Kg	4.44	7.14	2.09	ND	ND	ND
– Lead	No proposed level	138	12.7	8.28	10.8	11.4	ND
– Potassium	----	545	500	844	785	670	2.13
– Sodium	----	593	124	108	368	301	0.406
– Aluminum	----	18,200	17,000	14,600	13,500	17,800	ND
– Barium	----	68.5	50.8	35.1	62	60.9	ND
– Beryllium	0.2 mg/Kg	0.313	0.437	0.405	0.882	0.443	ND
– Calcium	----	7,390	1,160	398	737	695	161
– Cadmium	40 mg/Kg	1.16	ND	ND	ND	ND	ND
– Cobalt	----	12.3	7.1	4.89	8.14	9.29	ND
– Chromium	400 mg/Kg	32.4	20.2	20.5	36.4	35.3	ND
– Copper	----	95	9.21	10.4	16	13.3	ND
– Iron	----	16,900	22,500	15,600	17,300	13,500	ND
– Magnesium	----	3,980	1,880	2,040	2,300	2,120	ND
– Manganese	----	239	86.9	62.8	55.4	71.9	ND
– Nickel	2,000 mg/Kg	16.6	8.27	6.77	9.42	9.81	ND
– Vanadium	----	33.5	30.6	29.5	48.7	36.4	ND
– Zinc	----	484	51	35.4	34.5	32.6	ND

[1] Federal Register/Vol. 55, No. 145/Friday, July 27, 1990/Proposed Rules.
ND – No analytes detected above the laboratory detection limits.

SECTION 2

WORK MANAGEMENT PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

SECTION 2

WORK MANAGEMENT PLAN

2.1 PURPOSE

The purpose of this Work Management Plan (WMP) is to describe how each step of the DO will be managed and accomplished. The WMP sets forth the technical approach and presents the organizational structure and schedule for accomplishing the work.

The WMP contains six subsections:

Subsection	Title
2.1	Purpose
2.2	Technical Approach
2.3	Management Organization
2.4	Schedule of Work
2.5	Applicable Regulatory and Permitting Requirements
2.6	Notifications
2.7	References

2.2 TECHNICAL APPROACH

WESTON plans a sequential approach to implementation of the removal actions to be performed at APG-EA under DO No. 10 for the Adamsite Storage Vaults. The removal actions at these vaults shall be based on visual inspections, analytical results, the Preliminary Field Investigation Report for the Sampling of the Adamsite Storage Vaults (WESTON, 1993), the Sampling and Safety Plan for the Adamsite Storage Vaults (WESTON, April 1993), a search of existing historical records, and an Environmental Assessment (EA).

Specifically, WESTON's technical approach consists of the following activities:

1 • Conduct a records review and historical investigation (this activity has been completed).

2 • Develop and submit a Sampling and Safety Plan for approval (this activity has been completed).

3 • Sample and analyze the contents of the vaults, the concrete floor of the vaults, the soil surrounding the vaults, and the groundwater in the vicinity of the vaults (this activity has been completed).

4 • Develop and submit a Preliminary Field Investigation Report for approval (this activity has been completed).

5 • Evaluate and determine ARARs pertinent to this removal action.

6 • Develop and submit a SSWP to secure the vaults by sealing the interior of the vaults and filling them with a nonporous material, dismantle the building structure and dispose of scrap metal, remove accumulated water and sediments from the vaults, remove soils from areas where levels of specific compounds above RCRA Corrective Action Levels were previously detected, and remove visibly stained soils from the vault area.

7 • Mobilize for the removal actions.

8 • Conduct baseline air monitoring for organics and other contaminants.

9 • Establish site controls and prepare the site.

• Establish conditions for safe entry into the vaults and establish ventilation.

FW CHANGE

• Remove the contents of the vaults. Liquids and sediments shall be placed into 55-gallon drums and/or appropriate storage/transport containers. Debris (i.e., glass, metal, and plastic) shall be removed and staged for proper disposal, as necessary. All containers shall be segregated according to their contents and staged.

• Seal the inside of the vaults with epoxy coating or similar to prevent the infiltration of groundwater.

• Remove the aboveground building structure, dismantling the structural steel and breaking up the vault concrete that extends above the ground surface and placing the concrete into the vault as fill.

• Secure each vault by filling with nonporous material to 1 ft below the existing ground surface and fill with crushed stone to the existing ground surface.

• Remove soil in the area of soil boring B-2, where arsenic was detected, to a depth of 2 ft below the existing ground surface. Backfill with clean fill to 6 inches below the existing ground surface and fill with crushed stone to the existing ground surface.

• Remove soil in the area of soil boring B-3, where mercury was detected, to a depth of 2 ft below the existing ground surface. Backfill with clean fill to

6 inches below the existing ground surface and fill with crushed stone to the existing ground surface.

- Remove soil in the area of monitoring well MW-2, where PCBs were detected, to a depth of 2 ft below the existing ground surface. Backfill with clean fill to 6 inches below the existing ground surface and fill with crushed stone to the existing ground surface.

- Remove visibly stained surface soils to no more than 2 ft below the existing ground surface. Backfill with clean fill to 6 inches below the existing ground surface and fill with crushed stone to the existing ground surface.

- Conduct soil sampling of the excavated soils for disposal purposes and of the excavated areas for characterization purposes.

- Restore the site and demobilize.

- Prepare and submit a technical report.

WESTON recognizes the importance of implementing a safe and effective remediation program for APG. Our technical approach emphasizes the overall objectives of proper safety and personnel protection, while performing the field activities in a timely and professional manner. The proposed sequence of operations may vary based on field conditions/scheduling, but shall be conducted according to accepted safety and construction practices, and in accordance with EPA, Department of Transportation (DOT), federal, state, and local laws and regulations.

The scope of work summary presented in Table 2-1 provides a detailed summary of the proposed field activities and related assumptions for this DO.

2.2.1 Mobilization

WESTON shall mobilize personnel, equipment, facilities, and subcontractors to the site in the general sequence described in this subsection to avoid delays and maintain progress.

The WESTON project field team shall be selected to optimize the efficient execution of each phase of the field operations. The site crew shall consist of a Site Foreman, a Site Safety and Health Officer (SSHO), a Site Quality Assurance/Quality Control (QA/QC) Officer, a Site Engineer, Field Technicians, Equipment Operators, and subcontractors, as needed. WESTON may designate certain qualified individuals to perform multiple roles to maximize the efficiency of operations. The responsibilities of the WESTON project team personnel are discussed in Subsection 2.3.

Table 2-1

DO No. 10 — Adamsite Storage Vaults
Scope of Work and Assumptions

Task Description	Responsibility	Assumptions
Mobilization: - Preplanning. - Mobilize equipment. - Mobilize personnel.	WESTON	SSWP approved; necessary permits obtained.
Site preparation: - Conduct baseline air monitoring. - Delineate support zones and construct staging areas and decontamination areas, as needed. - Establish site controls.	WESTON	Existing site security fence may be relocated, if needed. DPW shall be available to perform utilities verification.
Remove contents of the vaults: - Remove accumulated water and sediments. - Remove debris, if required. - Pressure wash vault walls and floors.	WESTON	Oxygen-deficient or explosive atmosphere is not present in the vaults; no airborne contaminants or hazardous vapors are present. No radiation hazard above three times background exists. No groundwater infiltration or similar inflow into the vaults.
Seal the vault walls with water-resistant epoxy material or similar.	WESTON	No groundwater infiltration or similar inflow into the vaults.
Remove aboveground building structure: - Remove steel beams and roof. - Remove aboveground concrete and place as backfill in the vaults.	WESTON	All utilities (i.e., electric, gas, water, etc.) shall be shut off prior to demolition of the building.
Backfill the vaults with nonporous material to 1 ft below existing ground surface and crushed stone to existing ground surface.	WESTON	No groundwater infiltration or similar inflow into the vaults. Accumulated water due to rainfall, if any, shall be handled as vault water.
Remove soil in the vicinity of soil borings B-2 and B-3 and monitoring well MW-2, and perform sampling as discussed in Section 5.	WESTON	Soils removed shall be sampled for disposal parameters as discussed in Section 5. Excavation areas shall be sampled for characterization purposes as discussed in Section 5. The total area of excavation is less than 2,000 ft^2 and the total volume of excavation is less than 75 yd^3.
Backfill excavation areas.	WESTON	
Demobilization .	WESTON	

The anticipated equipment to be mobilized to the site may include, but not be limited to, the following:

- Manlift.
- Portable generators.
- Excavator/backhoe with extended boom and miscellaneous attachments.
- Crane.
- Winch/pulley equipment with harness for emergency personnel extraction.
- Torch.
- Portable water pumps.
- Site vehicles.
- Storage containers, as needed.
- Portable/temporary lighting.
- Ladders.
- Safety equipment for working in vaults and in confined spaces.
- Concrete saw.
- Personnel protective equipment (PPE).
- Safety barriers, handrails, etc., as needed.
- Sampling equipment, including:
  - Liquid, sediment, and soil sampling equipment.
- Air/personnel monitoring equipment, including:
  - Photoionization detector (PID).
  - Flame ionization detector (FID).
  - Combustible gas indicator/oxygen meter (CGI/O_2).
  - Air particulate detector.

- Radiation meter.

- Personnel and equipment decontamination supplies/equipment.
- Emergency response equipment (as described in Subsections 4.7 and 8.5).
- Equipment used in the contaminated materials staging/decontamination area (CMS/DA) may include, but not be limited to, the following:
  - 55-gallon drums.
  - 85-gallon overpacks.
  - Polypropylene tank (decontamination fluids), if needed.
  - 6-mil polyethylene sheeting.
  - Double-lined plastic bags.
  - Pump.
  - Industrial-strength bleach.

Figure 2-1 presents the proposed layout of the site work zones.

2.2.2 Site Preparation

2.2.2.1 Conduct Baseline Air Monitoring

Prior to startup, baseline air monitoring of the site shall be conducted to determine the presence and/or absence of airborne organic contaminants. No readings above background levels are anticipated since WESTON performed similar baseline air monitoring in July 1993 that resulted in no readings above background. However, to ensure the overall safety of WESTON personnel, background monitoring shall be performed by conducting a survey of the exclusion zone perimeter(s) with a CGI/O_2 meter, PID, and FID. Radioactivity area sweeps shall be made with a sodium iodide (NaI) gamma scintillator. The results of these monitoring activities shall be recorded in the appropriate documentation logs.

2.2.2.2 Delineate Support Zones and Construct Staging and Decontamination Areas

Once baseline air monitoring has been completed, field crews may establish site controls and delineate the project support zones. These zones include areas for the placement of the office/equipment trailer, equipment staging areas, debris staging areas, decontamination areas, and accessways as needed for field activities. Support zones shall be delineated, as necessary, by marking the ground with survey markers, and placement of safety cones, barrier tape, and/or similar markers over the perimeter of an area approximating the size and orientation necessary to accommodate the various elements/components mentioned.

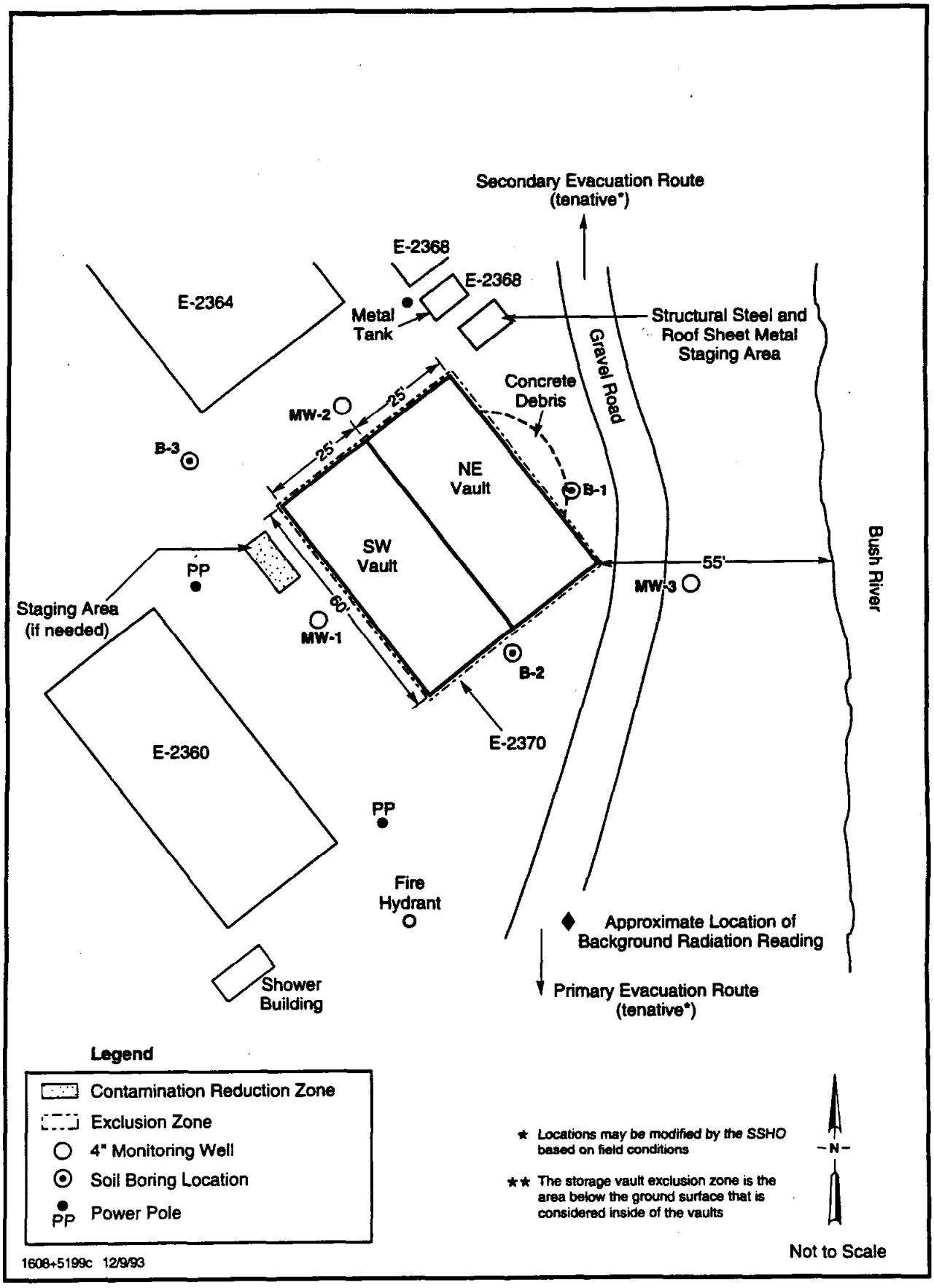


FIGURE 2-1 PROPOSED SITE LAYOUT
(TAKEN FROM DO No. 10 TECHNICAL REPORT)

The decontamination area shall be constructed by using plastic sheeting and constructing a small berm to create an impoundment and work area in which to conduct decontamination and to collect rinsate materials, if necessary.

The staging area(s) that may be utilized for the staging of the vault water and sediment removed and excavated soils shall be constructed by using plastic sheeting and constructing a small berm to create an impoundment. The polyethylene sheets shall be anchored to secure them from moving or being blown away. The staging area shall be designed to ensure that the materials shall be secured, minimizing the potential for release of contaminants into the environment. A staging area for the structural steel and roof materials shall not be constructed, but shall be designated as shown in Figure 2-1. This area shall be delineated and used for the torch cutting and staging of these noncontaminated materials, but shall not be bermed.

2.2.2.3 Establish Site Control

Access to the site shall be controlled to reduce the potential for contact with any contaminants present and to prevent, restrict, and/or minimize removal of contaminants by personnel or equipment leaving the site. The possibility of exposure or translocation of substances can be reduced or eliminated by establishing site security, designating work zones and entry procedures, conducting site-specific briefings to establish general site rules, and defining contamination controls to minimize the transfer of contaminants from the site. Subsequent to implementation of the site control measures, a preparatory QC inspection shall be performed to ensure that the site control measures presented in Subsection 4.4 of the SHERP are executed.

Work zones shall be established to prevent or reduce the migration of contaminants. When needed, the three zones that shall be established at the Adamsite Storage Vaults location are the exclusion zone, the contamination reduction zone, and the support zone. Subsection 4.4 of the SHERP, Site Control, describes these zones and their purposes.

Figure 2-1 illustrates the tentative arrangement of the zones for the activities for DO No. 10. The location and/or size of the zones may be modified based on field conditions.

Site security shall limit site access to only those personnel who are authorized, certified, and trained in site-specific safety, technical, and QC measures. Subsection 4.4.3 of the SHERP defines the site security procedures to be followed at the site.

WESTON has established, as part of its Standard Practices Manual, a general site safety guidance document. This document provides a list of operating practices for the following categories:

- General safety precautions.

- General housekeeping.
- Fire prevention.
- Electrical safety.
- Hand and power tool safety.
- Machinery and mechanical equipment safety.
- Medical and first aid procedures.
- Potable water and sanitary facilities.

These practices have been incorporated in the Standard Supplement.

2.2.3 Remove Existing Water and Sediment From the Vaults

The existing water and sediments in the vaults shall be removed. The vault water shall be transferred into tanker trucks, temporary containers, and/or 55-gallon drums. The containers, if needed, shall be segregated according to vault identification and clearly labeled indicating their contents, source, date of accumulation, and other applicable information. Sediment identified in the vaults shall be transferred into 55-gallon drums and/or similar approved containers. The sediment drums shall be segregated according to vault identification and clearly labeled indicating contents, source, date of accumulation, and other applicable information. Any containers with water or sediment shall be moved to the designated staging area. Chemical Waste Management (CWM) shall be the anticipated disposal company for the vault water and sediments unless the APG wastewater treatment plant (WWTP) will accept it. Disposal of the vault water shall be coordinated with CEAAO and DSHE.

2.2.4 Pressure Wash/Clean the Emptied Vault

The vault interiors shall be pressure washed to remove gross visible surface contaminants. The decontamination fluids (i.e., water) shall be collected and handled similar to the existing vault water since the concrete has been determined to be nonhazardous from previous sampling activities. The decontamination fluids shall be transferred into 55-gallon drums, temporary containers, or similar approved containers. The containers shall be segregated and clearly labeled indicating their contents, source, date of accumulation, and other applicable information. WESTON shall inspect, plug, and/or remove any piping, if accessible. During the transfer of vault water and/or decontamination fluids, WESTON shall observe the outlets of any piping and the effects of groundwater infiltration for any source of water entry. If water infiltration is detected in the vaults, WESTON shall seal/repair the affected areas and shall proceed with the activities. The concrete surfaces of the vaults (i.e., walls and floors) shall be coated with a water-resistant epoxy or similar material to minimize future groundwater infiltration.

2.2.4.1 Sample/Remove Decontamination Solution (If Required)

Any decontamination solution generated during field activities shall be containerized, sampled, and analyzed for proper disposition (see Section 5, FSAP). This sampling shall focus on known contaminants and may include any of the following parameters:

- TCLP analytes:
  - Metals.
  - Volatile organics.
  - Semivolatile organics.
  - Pesticides/herbicides.
- Reactivity (cyanides/sulfides).
- Corrosivity.
- Ignitibility.
- pH.
- PCBs.
- Nitrate.
- Oil and grease.
- Total petroleum hydrocarbons (TPH).
- Total phosphorous/total organic carbon (TOC).

2.2.5 Removal of Existing Roof Panels, Structural Steel, and Concrete Sidewalls

Prior to the start of building removal activities (i.e., roof panels, structural steel, concrete sidewalls, etc.) at the Adamsite Storage Vaults, a competent WESTON person shall perform a structural survey to determine the condition of the roof, structural steel, the concrete sidewalls, and/or the possibility of unplanned collapse of the structure during removal activities.

A utility survey has been performed in the area of the Adamsite Storage Vaults by the Department of Public Works (DPW) prior to WESTON sampling activities in July 1993. An overhead utility line that existed in the vicinity of the building was removed and all underground utilities in the vicinity of the Adamsite Storage Vaults were located and verified by DPW in July 1993. WESTON shall notify base utility personnel prior to building removal to ensure that no electricity, gas, or other service lines are active at the Adamsite Storage Vaults during removal activities. During excavation activities or building removal activities requiring the use of heavy equipment (i.e., excavator/backhoe), WESTON shall contact DPW. WESTON shall ensure that DPW disconnects electrical power and/or any other potentially affected utilities in the area of the vaults on a daily basis, as needed.

Building removal shall consist of removal of the existing roof panels, removal of structural steel, and breaking up of the concrete vault sidewalls to the approximate elevation of the existing ground surface. The roof panels and the structural steel of the building shall be removed by utilizing a manlift or similar for access. Handtools, cold cutting, and/or torch cutting shall be employed for dismantling the roof panels and the structural steel. A crane, excavator, and/or similar device shall be used to support and/or remove the roof panels and the structural steel, as necessary. REPLACE

Roof panels and structural steel removed from the building shall be placed in the designated staging area, as shown in Figure 2-1. WESTON shall torch cut, cold cut, and/or further dismantle the roof panels and structural steel at the designated staging area into smaller pieces to allow for transport and proper disposal. A Hot Work Permit shall be obtained from the APG Fire Department prior to any hot work on-site.

The concrete sidewalls of the vaults shall be broken up using an excavator/backhoe with a hydraulic ram, handtools, and/or similar equipment. The resulting debris shall be backfilled into the vaults.

The dismantling of the aboveground steel structure and aboveground concrete sidewalls of the Adamsite Vaults shall follow the Site-Specific Demolition Plan outlined in the SHERP (see Attachment 4-4) unless field conditions require modification. The SSHO and an on-site State of Maryland Professional Engineer shall review and approve any major modifications. REPLACE

2.2.5.1 ADDED

2.2.6 Backfill Vaults

The vaults shall be backfilled with a nonporous material to a depth of 12 inches below the existing ground surface. The remainder of the space in the vault shall be backfilled with crushed stone to the elevation of the existing ground surface. REPLACE

2.2.7 Remove Stained Soils

Visibly stained soils in the area of the Adamsite Storage Vaults shall be removed to a depth of 2 ft. The lateral limits of the excavation shall be defined by visual observation and/or air monitoring data, if possible. If visual observation and/or air monitoring data cannot delineate an identifiable area of excavation (i.e., a scenario may occur where stained soils exist at or near the ground surface, but not after excavation begins), then WESTON shall limit the area of excavation to an approximate radius of 5 ft as measured from the center of the original stained area. Approximately 18 inches of clean backfill shall be placed into the excavation area and compacted. A final 6-inch-thick layer of crushed stone shall be placed into the excavation area to bring the area to the elevation of the existing ground surface. Disposal of the excavated soils shall be coordinated with CEAAO and DSHE.

2.2.8 Remove Soil in the Area of Soil Boring B-2

The soils in the area of soil boring B-2 shall be removed to a depth of 2 ft due to detectable levels of arsenic in the soil. The lateral limits of the excavation shall be defined by an approximate radius of 5 ft as measured from the center of the original location of soil boring B-2. Approximately 18 inches of clean backfill shall be placed into the excavation area and compacted. A final 6-inch-thick layer of crushed stone shall be placed into the excavation area to bring the area to the elevation of the existing ground surface. Disposal of the excavated soils shall be coordinated with CEAAO and DSHE. DELETE

2.2.9 Remove Soil in the Area of Soil Boring B-3

The soils in the area of soil boring B-3 shall be removed to a depth of 2 ft due to detectable levels of mercury in the soil. The lateral limits of the excavation shall be defined by an approximate radius of 5 ft as measured from the center of the original location of soil boring B-3. Approximately 18 inches of clean backfill shall be placed into the excavation area and compacted. A final 6-inch-thick layer of crushed stone shall be placed into the excavation area to bring the area to the elevation of the existing ground surface. Disposal of the excavated soils shall be coordinated with CEAAO and DSHE. DELETE

2.2.10 Remove Soil in the Area of Monitoring Well MW-2

The soils in the area of the monitoring well MW-2 shall be removed to a depth of 2 ft due to detectable levels of PCBs in the soil. The lateral limits of the excavation shall be defined by visual observation, if possible, and/or by an approximate radius of 5 ft as measured from the center of the original location of monitoring well MW-2. Approximately 18 inches of clean backfill shall be placed into the excavation area and compacted. A final 6-inch-thick layer of crushed stone shall be placed into the excavation area to bring the area to the elevation of the existing ground surface. Disposal of the excavated soils shall be coordinated with CEAAO and DSHE. DELETE

2.2.11 Sampling and Analysis

Sampling of the existing vault water and the existing vault sediments shall not be required since these materials were previously sampled by WESTON in July and August 1993. The vault water and sediments were determined to be nonhazardous waste as defined in 40 CFR 261. Therefore, these materials shall not be resampled prior to disposal. A summary of the analytical results is included in Attachment 1-3.

Excavated soils from the areas proposed in this WMP shall be sampled and analyzed for disposal parameters. The excavation areas shall be sampled and analyzed for characterization purposes. The sampling procedures and analytical parameters shall be performed in accordance with the applicable sections of the FSAP, Section 5.

REPLACE

2.2.12 Restore Site/Demobilize

Following removal of the aboveground building structure, securement of the vaults, and soil excavation and soil sampling activities, the decontamination and staging areas shall be dismantled and removed, as necessary, and the site areas shall be regraded to a condition similar to their condition before activities began. Upon completion of site restoration, all equipment, materials, and personnel shall be demobilized from the site.

2.2.13 Prepare and Submit Technical Report

After completion of all work, WESTON shall prepare and submit to CEAAO a technical report (ELIN A004) covering all operations and activities conducted during the removal actions. This report shall be prepared in accordance with DO No. 10 specifications and MIL-STD-847, and shall include thorough documentation of all fieldwork to aid in characterizing site hazards for future remediation efforts.

The technical report shall document the activities at the site and shall include the following:

- Executive summary.
- Background.
- Description of the site.
- Narrative describing each of the tasks performed, health and safety, sampling and monitoring, and disposal.
- Chronology of activities.
- Summary and recommendations.

Figures shall include:

- Site plan indicating vault locations.

Appendices will include:

- Daily reports.
- Audits.
- Monitoring logs.
- Analytical results.
- Permits.

- Laboratory results, including QA/QC documentation and chain-of-custody.
- Transportation/disposal documentation.

As required by CEAAO, this document shall be sealed by a professional engineer registered in the State of Maryland.

2.3 MANAGEMENT ORGANIZATION

2.3.1 Overview

WESTON has selected a professional staff specifically for implementation of DO No. 10 (see Figure 2-2). This subsection describes the functions, duties, and responsibilities of the individual members of the WESTON organization. Resumes for WESTON personnel are presented in Attachment 2-1 of this SSWP and in Attachment A-1 of the Standard Supplement.

2.3.2 WESTON Program Safety Manager

The WESTON Program Safety Manager designated for this DO is Mr. George Crawford, Certified Industrial Hygienist (CIH). He shall review and approve the overall site safety plan, described in the SHERP. He shall also be accountable for implementation of the SHERP and shall approve any changes to the SHERP for WESTON.

2.3.3 Project Health and Safety/QA/QC Officer

The Project Health and Safety/QA/QC Officer shall be accountable for conformance of project activities with the requirements of the SHERP and the CQCP, and for determining that the stated activities fulfill the objectives for which they were designed. In this position, the Project Health and Safety/QA/QC Officer shall serve as the focal point of WESTON's management system for producing quality work that complies with the terms of the contract. Mr. Michael Harmer, P.E., shall serve as the Project Health and Safety/QA/QC Officer.

2.3.4 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) shall report to Mr. Crawford through the Project Health and Safety/QA/QC Officer for all safety issues. The SSHO shall be accountable for implementing the SHERP. WESTON has a pool of qualified SSHOs from which to select a SSHO for this project. A selection shall be made prior to the start of field activities. Resumes for some of the prospective SSHOs are contained in Attachment 2-1 of this SSWP.

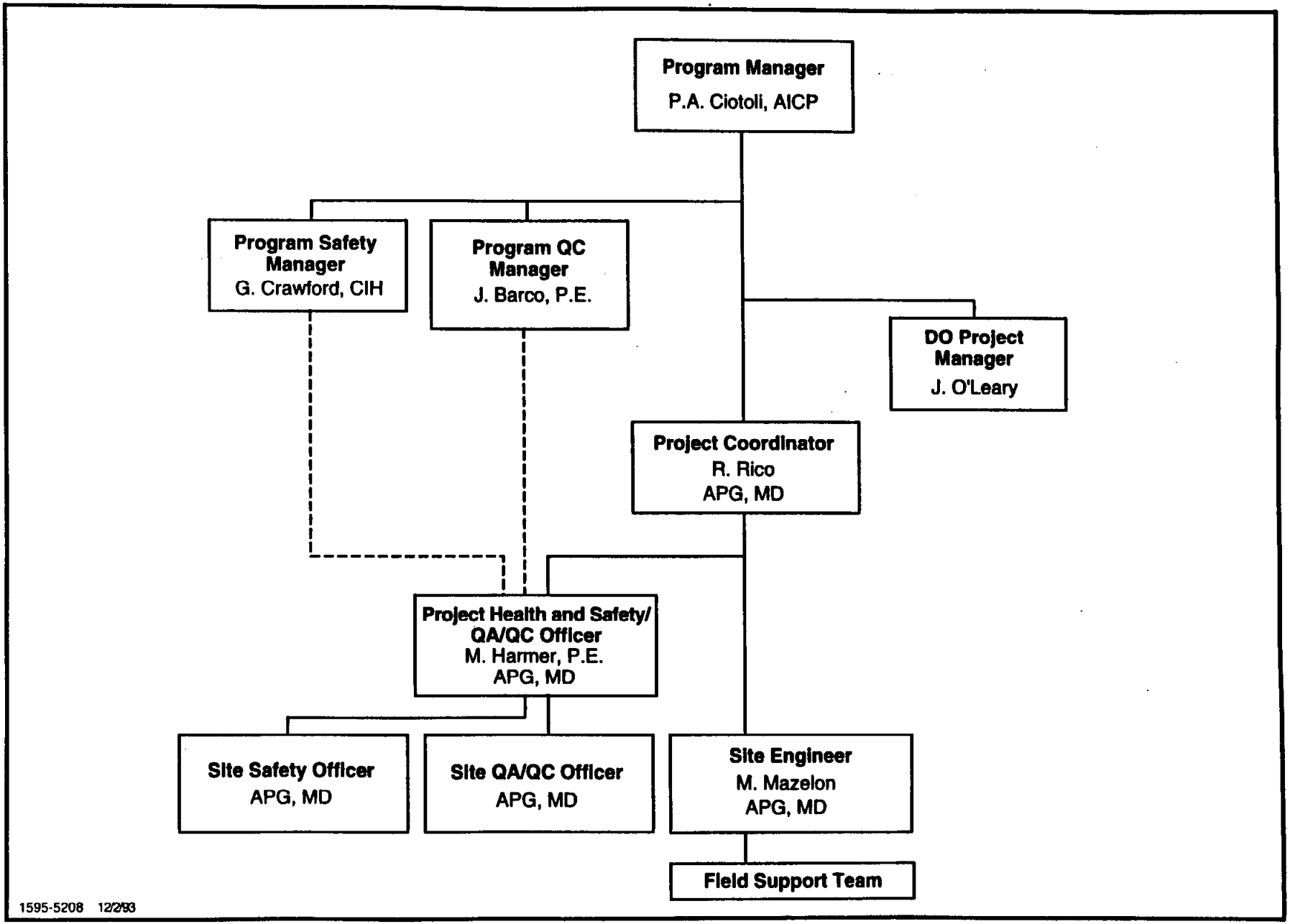


FIGURE 2-2 PROGRAM ORGANIZATION CHART FOR DELIVERY ORDER NO. 10

2.3.5 WESTON Program QC Manager

WESTON's Program QC Manager shall ensure appropriate implementation of all aspects of the QC plan and associated contract requirements. In this capacity, the Program QC Manager shall:

- Assign and schedule all personnel and resources necessary to conduct QC activities.
- Oversee the activities of the Project Health and Safety/QA/QC Officer.

Mr. Joseph Barco, P.E., shall serve as the WESTON Program QC Manager for activities associated with DO No. 10.

REPLACE

2.3.6 WESTON Program Manager

The WESTON Program Manager shall be accountable for establishing and executing project administration, project controls, project-related policy matters, and project levels of authority, responsibility, and communication. Mr. Peter A. Ciotoli, American Institute for Certified Planners (AICP), shall serve as the Program Manager.

REPLACE

2.3.7 DO Project Manager

The DO Project Manager shall be accountable for the site-specific planning, coordination, and administration of task-specific activities in accordance with the requirements of DO No. 10. The DO Project Manager shall document compliance by reviewing the SSWP and supporting documents, overseeing task performance, identifying task planning and resource requirements, and reviewing technical documents. Ms. Jeanne O'Leary shall serve as the DO Project Manager. REPLACE

2.3.8 Project Coordinator

The Project Coordinator shall support the DO Project Manager on all fieldwork required for DO No. 10. Located at the WESTON office in the Edgewood Area, the Project Coordinator shall be accountable for interfacing with CEAAO and the base organization, mobilization of resources, and coordination of field operations. This position shall provide the local point of contact for all DO matters. Mr. Roberto Rico shall serve as the Project Coordinator. REPLACE

2.3.9 Site Engineer

The Site Engineer shall supervise all of the field removal activities of each task of DO No. 10. This person shall serve as the principal field authority and focal point for

ensuring that the removal activities conform to the requirements of the SSWP. Site-specific field activities also shall include: confirmation of the locations of all underground utilities and structures in conjunction with facility officials; procurement of all permits; and conformance with all site safety, security, and government guidance documents and regulations. Mr. Mike Mazelon shall serve as the Site Engineer for DO No. 10. In the event Mr. Mazelon is unavailable to act in this position, WESTON has a pool of qualified personnel who can be used in his place. Resumes for some of these prospective personnel are contained in Attachment 2-1. DELETE

2.3.10 Resumes

Resumes for the Program Manager, Program Safety Manager, Program QC Manager, DO Project Manager, and Project Health and Safety/QA/QC Officer are presented in Attachment A-1 of the Standard Supplement. DELETE

2.4 SCHEDULE OF WORK

The projected schedule for accomplishment of DO No. 10 is presented in Figure 2-3. The Notice to Proceed with the WESTON technical approach was given following the scoping meeting with CEAAO.

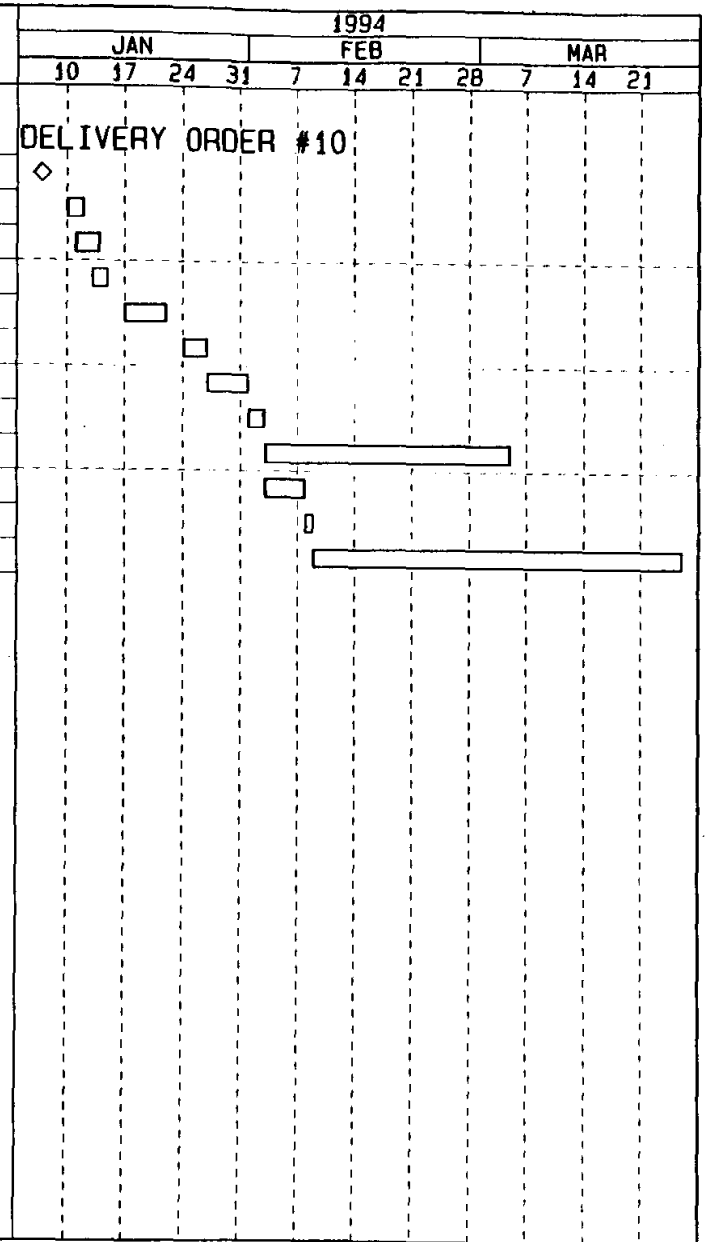
2.5 APPLICABLE REGULATORY AND PERMITTING REQUIREMENTS

In accordance with paragraph 3.2.1.10 of Section C of the basic contract and Subsection 3.2.7 of the Statement of Work for DO No. 10, the applicable federal, state, and local environmental regulations that govern the removal activities are as follows.

2.5.1 Federal Regulations

RCRA is the applicable federal law for the removal actions described in this WMP. RCRA requires that corrective actions be taken at solid waste management units (SWMUs) posing an imminent threat to human health and the environment. The vaults addressed in this WMP are SWMUs (Nemeth, 1989) that require corrective actions as described in RCRA. Other federal laws are applicable due to the various aspects required in this WMP. These include the Solid Waste Disposal Act (SWDA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund) (CERCLA), and the Hazardous and Solid Waste Amendments of 1984 (HSWA) due to the potential for generation of sediment, water, soils, and/or debris requiring disposal. The Toxic Substances Control Act (TSCA) would be applicable if PCBs are handled. All soils excavated from the area of monitoring well MW-2 shall be handled in accordance with the TSCA since PCBs were detected in the

ACTIVITY DESCRIPTION	ORIG DUR	EARLY START	EARLY FINISH
Removal Plan Approved	0	7JAN94	
Mobilization	2	10JAN94	11JAN94
Site Preparation	3	11JAN94	13JAN94
Remove Vault Contents	2	13JAN94	14JAN94
Building Demolition/Dismantling	5	17JAN94	21JAN94
Backfilling of Vaults	3	24JAN94	26JAN94
Excavate Contaminated Soils	3	27JAN94	31JAN94
Sampling	2	1FEB94	2FEB94
Sample Analysis	30	3FEB94	4MAR94
Site Restoration	3	3FEB94	7FEB94
Demobilization	1	8FEB94	8FEB94
Technical Report	33	9FEB94	25MAR94



Plot Date 6DEC93
Data Date 1DEC93
Project Start 1JAN93
Project Finish 25MAR94

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

AB10

Sheet 1 of 1

U.S. Army Corps of Engineers
Adamsite Storage Vaults
Delivery Order #10

Date	Revision	Checked	Approved

A DAVE

soils samples from MW-2. Transportation of materials is regulated by DOT regulations in 49 Code of Federal Regulations (CFR) 107 and 171 through 178.

The applicable federal environmental regulations that govern or may govern the removal activities are listed below:

- **Public Law 91-190,** The National Environmental Policy Act (NEPA'70), 83 Stat. 852 et seq., 1 January 1970, as amended. Codified in **Title 42 USC §4321 et seq. (NEPA'70).**

- **Public Law 92-500,** Federal Water Pollution Control Act Amendments of 19972 (FWPCAa'72) [a.k.a. Clean Water Act (CWA'72)], 86 Stat. 1251 et seq., 18 October 1972, as amended. Codified in **Title 16 USC §661 et seq. (FWPCAa'72)** and **Title 33 USC §1251 et seq. (CWA'72).**

- **Public Law 94-469,** Toxic Substance Control Act (TSCA'76), 90 Stat. 2003 et seq., 11 October 1976, as amended. Codified in **Title 15 USC §2601 et seq. (TSCA'76).**

- **Public Law 94-580,** Resource Conservation and Recovery Act of 1976 (RCRA'76), 90 Stat. 2795 et seq. 21 October 1976, as amended. Codified in **Title 42 USC §6901 et seq. (RCRA'76).**

- **Public Law 96-483,** Solid Waste Disposal Act Amendments of 1989 (SWDAa'80), 94 Stat. 2334 et seq., 21 October 1980, as amended.

- **Public Law 96-510,** Comprehensive Environmental Compensation and Liability Act of 1980 (CERCLA'80), 94 Stat. 2767 et seq., 11 December 1980, as amended. Codified in **Title 42 USC §9601 et seq. (CERCLA'80).**

- **Public Law 96-616,** Hazardous and Solid Waste Amendments of 1980 (HSWa'80), 8 November 1980. Codified in **Title 42 USC §6901 et seq. (RCRA'76).**

- **Public Law 99-499,** Superfund Amendment and Reauthorization Act of 1986 (SARA'86), 100 Stat. 1724 et seq., 17 October 1986. Codified in **Title 10 USC §2701 et seq. (SARA'86). Special attention** to §211, Department of Defense Environmental Restoration Program.

- **EO 11990** (24 May 1977), Protection of Wetlands, as amended.

- CFR:

  - **Title 29:** Parts 1910 and 1926 (Law - OSHA; Activity - Personnel Safety).

  - **Title 40:** Parts 260-268, 271, and 700 to end (Law - RCRA and TSCA; Activity - Removal Actions, Disposal).

  - **Title 49:** Parts 107 and 171-178 (Law - CERCLA; Activity - Transportation).

2.5.2 State of Maryland Regulations

Disposal of controlled hazardous substances is regulated under the Maryland Code of Regulations (COMAR) Title 26, Department of the Environment. WESTON shall review these regulations and their applicability to this removal action following receipt of the excavated soils laboratory analytical results.

In general, disturbances to the environment resulting from implementation of the site activities shall be minimized. Any erosion control deemed necessary shall be consistent with the State of Maryland guidelines. The guidelines require that an Erosion Control Plan be submitted to the Maryland Department of Environment (MDE) prior to commencing any activities causing a soil disturbance that will exceed 5,000 ft^2 in area or an excavation exceeding 100 yd^3 in volume. The WESTON site activities that are proposed in this SSWP do not exceed these guidelines. If the site activities require additional excavation that approaches the limits in the guidelines, WESTON shall develop an Erosion Control Plan in accordance with COMAR, Title 26, Subtitle 9, Chapter 1 and submit the plan to MDE prior to commencement of activities causing soil disturbance/excavation exceeding the guidelines.

2.5.3 Local/Other Applicable Regulations

All applicable sections in the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM 385-1-1) shall be followed by WESTON.

The Dangerous Goods Regulations published by the International Air Transport Association (IATA) shall be adhered to whenever shipping and/or receiving dangerous goods. All environmental samples for laboratory analysis shall be shipped by Michael Harmer, P.E., or a qualified designated substitute. Mr. Harmer or the designated substitute shall have received the required 16-hour IATA training for shipment of dangerous goods. The applicable USACE and local regulations that govern or may govern the removal activities are listed below:

- ER 385-1-92, Safety and Occupational Health Document Requirements for Hazardous Waste Site Remediation Actions.
- EM 385-1-1, Safety and Health Requirements Manual.
- AMC-R-385-100, Safety Manual.
- International Air Transport Association (IATA), Dangerous Goods Regulations.
- International Commercial Aviation Organization (ICAO), Technical Instructions for the Safe Transportation of Dangerous Goods.
- AR 55-56, Transportation of Dangerous or Hazardous Materials.
- AR 190-40, Serious Incident Reports.
- AR 385-10, The Army Safety Program.
- AR 385-32, Protective Clothing and Equipment.
- AR 385-40, Accident Reporting and Records.
- AR 385-55, Prevention of Motor Vehicle Accidents.
- AR 420-47, Solid and Hazardous Waste Management.

2.5.4 Applicable Permits

The following permits shall be obtained by WESTON or its subcontractors for the performance of DO No. 10:

- State of Maryland Transporters Permit (if needed).
- APG Permit for Cameras.
- Confined Space Entry Permit. (IF NEEDED)
- Excavation Permit (this permit shall be obtained prior to the excavation of soils).

An Excavation Permit is required prior to beginning excavation work at the site. The appropriate forms shall be submitted to APG authorities for the Excavation Permit.

An Erosion Control Plan and approval shall not be required for the activities proposed in this SSWP. The approximate soil disturbance activities are much less than 5,000 ft^2 and the expected excavation volume is much less than 100 yd^3.

2.6 NOTIFICATIONS

A list of the appropriate personnel and agencies that WESTON shall notify before commencing field activities is provided in Attachment A-2 of the Standard Supplement.

Additional notifications shall be sent to the following:

DSHE Project Officer
Commander, APG Support Activity
Attn: Mr. Don Green
Building E-4430
APG, MD 21010
(410) 671-3660

Commander, Kirk Army Health Clinic
Attn: Col. Wong
Building 2501
APG, MD 21010
(410) 671-3001

2.7 BIBLIOGRAPHY

Code of Federal Regulations (CFR); Title 40, Part 700 to End, Revised as of 1 July 1990.

Code of Maryland Regulations (COMAR). Titles 1, 2, 3, 4, 7, 9, 26; Title 6 - Subtitle 5, Title 8 - Subtitle 13, Title 26 - Subtitle 9 and 11. Maryland Department of Natural Resources, Maryland Department of the Environment, and Maryland Air Management Administration.

Maryland Department of the Environment, Air Management Administration, Maryland Air Quality Data Report, 1990.

Nemeth, G. U.S. Army Environmental Hygiene Agency. RCRA Facility Assessment Report, Edgewood Area of Aberdeen Proving Ground, MD, No. 39-26-0490-90. November 1989.

Nemeth, G., J.M. Murphy, and J.H. Zarzycki. 1983. "Environmental Survey of the Edgewood Area of Aberdeen Proving Ground, MD." DRXTH-AS-FR-82185. U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland. January 1983.

Public Law 91-190, National Environmental Policy Act (NEPA); 83 Stat. 852 et seq.

Public Law 94-580, Resource Conservation and Recovery Act (RCRA); 90 Stat. 2795 et seq.

Public Law 95-510, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); 94 Stat. 2767 et seq.

Superfund Amendments and Reauthorization Act (SARA); 100 Stat. 1724 et seq.

Thoreson, CPT, Brian D. 1978. "Water Quality Biological Study No. 24-0043-78, An Assessment of Surface Waters, Aberdeen Proving Ground — Edgewood Area, Maryland, 11-29 July 1977." Project 24-0043-78, Water Quality Engineering Division, U.S. Army Environmental Hygiene Agency (USAEHA). Aberdeen Proving Ground, Maryland. 7 April 1978.

U.S. Army Corps of Engineers As-Built Drawings and Upgrade Drawings.

U.S. Department of the Army, Washington, DC. Army Regulation 200-2, "Environmental Effects of Army Actions." 23 December 1988, and AR 200-2 Update.

U.S. Environmental Protection Agency. Maps Depicting Nonattainment Areas Pursuant to Section 1077 of the Clean Air Act — 1983. Office of Air Quality Planning and Standards, Research Triangle Park, NC. 1983.

U.S. Geological Survey (USGS) 7.5-Minute Series Topographic Maps, Gunpowder Neck Quadrangle, Photo-Revised, 1986.

Preliminary Field Investigation Report, Sampling of the Adamsite Storage Vaults at Edgewood Area, WESTON, 22 October 1993.

Sampling and Safety Plan for the Adamsite Storage Vaults at Edgewood Area, WESTON, 16 April 1993, Rev. 0.

Sample Analysis Report, GP Work Order No. 92-95-187, Contract ARM 410. GP Environmental Contract AP 410, May 1992.

ATTACHMENT 2-1

MANAGEMENT PERSONNEL RESUMES

MICHAEL T. HARMER, P.E.

Registration

Registered Professional Engineer in the State of Delaware (1991) and State of Maryland (Pending)
Certified Operator of Nuclear Compaction Testing Equipment, Troxler Electronic Laboratories, Inc. (1989)
PADI Certified Open Water SCUBA Diver

Fields of Competence

Hazardous materials safety programs; Occupational Safety and Health Administration (OSHA) health and safety training; water/wastewater, toxic/hazardous, and groundwater remediation systems design; site assessments; environmental audits; construction management and oversight; Resource Conservation and Recovery Act (RCRA) corrective action; environmental compliance; permitting.

Experience Summary

- Project Health and Safety/QA/QC Officer and Project Engineer for the Aberdeen Proving Ground Installation Restoration Program (munitions characterization and remediation).
- Project Manager for $5.0-million RCRA Corrective Action.
- More than 6 years of technical experience in the design of water and wastewater systems design and construction, including conveyance, pretreatment, alkalinity control, and disinfection.
- Environmental administrator for a hazardous waste treatment, storage, and disposal facility (TSDF).
- Health and safety training. Developed and implemented 40-hour OSHA health and safety training course for hazardous materials workers.
- Site Health and Safety Officer for site assessments for munitions blasting ponds.
- Landfill and leachate collection/treatment design and construction oversight support.
- Cost tracking and budgeting for environmental construction projects.
- Preparation and implementation of numerous site assessment plans including quality assurance plans as required by the Environmental Protection Agency (EPA).

MICHAEL T. HARMER, P.E.
(continued)

Experience Summary (continued)

- Specifications, bid documents, contractor selection/negotiations, field supervision, and startup.
- Property transfer and environmental risk assessment surveys.

Credentials

B.S.C.E., Civil Engineering — Mississippi State University (1986)
Graduate Studies, Environmental Engineering — University of Delaware (In Progress)
40-hour OSHA Hazardous Materials Site Worker Training
Site Manager/Coordinator Health and Safety Training
American Society of Civil Engineers
American Institute of Plant Engineers, Former Chapter Secretary
United States Coast Guard Auxiliary Boating Skills and Seamanship Course
United States Coast Guard Auxiliary Basic Coastal Navigation Course
United States Coast Guard Auxiliary Advanced Coastal Navigation Course

Employment History

1991-Present	WESTON
1991	Consulting Services, Inc.
1990-1991	Delaware Container Company, Inc.
1989-1990	Dames & Moore
1988-1989	WESTON
1986-1988	CABE Associates, Inc.

Key Projects

Interim Remedial Measure, Aberdeen Proving Ground, Aberdeen, MD, U.S. Army Corps of Engineers, Baltimore District, Project Engineer/Safety Engineer/Project Foreman. Interim remedial measures performed as part of the IRP at various areas. Project included extensive advance planning to organize field activities; characterization of chemical surety materials testing and disposal areas; removal of hazardous wastes; implementation of erosion and flood controls; and surveying with electronic ferrous metal detection equipment for potentially unexploded ordnance. Responsibilities as a Project Engineer included work plan development and review, materials selection and geotechnical calculations review. Responsibilities as Safety Engineer consisted of implementation of the health and safety plan for several sites at the Edgewood Area. Successful completion of these activities led to becoming the Project Health and Safety/QA/QC Officer responsible for ensuring that

Key Projects (continued)

the field activities at all ongoing sites conformed to the provisions of the respective site health and safety plan and the contractor quality control plan. Responsibilities as Project Foreman on two separate sites consisted of coordinating and performing field activities such as site mobilization, drum removal and disposal, munitions-related debris removal and disposal, soil borings and sampling, heavy equipment operation, and demobilization. Also served as the WESTON boat pilot (meeting U.S. Corps of Engineers requirements) supporting the project as needed. The following is a summary of title and work performed at each specific site:

- Carroll Island - Delivery Order (DO) No. 4: Project Health and Safety/QA/QC Officer
- Graces Quarters - DO No. 3: Project Health and Safety/QA/QC Officer
- Kings Creek - DO No. 5A: Site Health and Safety Officer/Helper
- 26th Street Disposal Site - DO No. 5B: Project Engineer
- J Field - DO No. 6: Project Health and Safety/QA/QC Officer; Site Health and Safety Officer; Helper
- Beach Point - DO No. 7: Site Health and Safety Officer/Project Foreman
- G Field - DO No. 9: Site Health and Safety Officer/Project Foreman
- Adamsite Storage Vaults - DO No. 10: Project Engineer
- Old O-Field - DO No. 15: Project Health and Safety/QA/QC Officer; Site Health and Safety Officer

Ordnance and Explosive Waste Site Characterization, DuPont Company, Staff Engineer/ Safety Coordinator. Performed technical support for various interim remediation projects involving stormwater diversion channels, stream encroachment, liners, and excavation. Performed health and safety monitoring during site characterization activities at abandoned blasting ponds where off-specification blasting caps were detonated and disposed of. Air monitoring included the use of personal air sampling pumps for metals, HNu, OVA, CGI, MINICAMS™, and radiation monitoring.

Key Projects (continued)

Polychlorinated Biphenyls (PCB) Remediation, Scranton, PA, Confidential Electrical Generating Station, Health and Safety Coordinator. Performed on-site health and safety coordinator activities for the remediation of PCBs at an electric generating station that had previously experienced a PCB fire. Responsibilities included monitoring workers in Level C protection for heat stress, verifying decontamination activities, recommending/ implementing health and safety procedures, and performing confirmation sampling of the remediation activities. The contaminated building contained several physical and chemical hazards that were monitored very closely with various testing equipment.

Petroleum-Contaminated Soil Remediation, Confidential Client, Site Health and Safety Coordinator. Performed on-site health and safety coordinator activities for the construction of an aboveground soil ventilation system for soils contaminated with petroleum hydrocarbons. Responsibilities included the development and implementation of a health and safety plan (HASP) requiring monitoring with an organic vapor analyzer (OVA), Draeger tubes, and soil sampling. Level C protection was required for workers while constructing system components within the contaminated soils that were placed above and below soil ventilation piping and valves.

Groundwater Remediation System Turnkey Design, New York, Confidential Client, Project Engineer. Developed an enhanced conceptual and final design for a 10-gallon-per-minute (gpm) pump and treat system. Treatment included filtration and air stripping of TEX compounds prior to discharge into the client's wastewater pretreatment plant. Performed design/site engineering duties during system construction and startup. In addition, assisted in the procurement of equipment, as requested.

Environmental Compliance, Pennsylvania, Delaware Container Company, Inc., Environmental Administrator. Responsible for daily environmental compliance and monitoring of a hazardous waste TSDF. Developed and assisted in an OSHA 40-hour health and safety training course for the yard workers and emergency response/remediation personnel. Involved in compliance, modification, and implementation requirements for RCRA Part B, air, National Pollutant Discharge Elimination System (NPDES), and corrective action permits.

Site Assessments, Pennsylvania, Confidential Client, Site Engineer. Multiple-site assessment program for PCB contamination delineation. Responsible for implementation of the site sampling plan and submittal of findings to the Pennsylvania Department of Environmental Resources. Served as health and safety coordinator and site engineer during all on-site sampling activities.

Key Projects (continued)

RCRA Corrective Action and Wastewater Treatment Upgrades, Delaware, Confidential Client, Project Manager. Responsible for managing the design of an RCRA double-liner system and the construction oversight for the installation of the subgrades, conveyance systems, and equipment. Project included oversight of excavation activities of soils contaminated with vinyl chloride and other volatile organic compounds, confirmation sampling as required by EPA, and volume estimates. Served as site health and safety coordinator during confirmation sampling activities.

Pump Station Design, Delaware, Kent County, Project Engineer. Design, specifications, bid documents, contractor selection, field inspection, and startup for a 100-gpm sanitary pumping station. Design included a wet well capable of becoming pressurized, which, in the event of pump failure, would allow bypass of the failed pump. This eliminated the requirement for a standby pump and an emergency generator, resulting in significant cost savings to the county.

Permitting Projects, Various Locations, Multiple Clients, Engineer. Environmental permitting projects for industrial clients, including construction, air, NPDES, RCRA Part B modifications, corrective action, erosion and sedimentation control, and various other types of permits.

DONALD KLEBES

Registration

Certified Operator of Nuclear Compaction Testing Equipment, Troxler Electronic Laboratories, Inc. (1990)
Certified Owens Corning Fiberglass Underground Storage Tank (UST) Installer/Inspector (1990)
Certified Pennsylvania DER UST Installer/Removal/Inspector (1992)
Certified in the operation of PETRO TITEII and PETRO TITELINE Tightness Testing for USTs (1992)

Fields of Competence

UST remedial activities; bid proposal writing for UST remediation; and installation, service, and support of small-media dispersion equipment. Operation of Troxler nuclear density compaction equipment.

Experience Summary

- Project engineering and site engineering of UST projects.
- Site investigations and proposal writing for UST removal and in-place closures.
- Site evaluation, operation, and instruction of dispersion mills for various applications.
- Cost tracking and budgeting for environmental construction projects.

Credentials

B.S., Civil Construction Engineering Technology — Temple University (1988)
Project Management Certification — The Pennsylvania State University (Ongoing)
Site Health and Safety Coordinator (SHSC) Certification Training (WESTON)

Employment History

1990-Present WESTON
1989-1990 Netzsch, Inc.

Key Projects

Containment and Treatment of Contaminated Groundwater at Old O-Field Aberdeen Proving Ground, Edgewood, MD, Aberdeen Proving Ground, Site Manager. Managed various aspects of project operations from mobilization through current well development operations. Early phases of operations consisted of oversight and direction of topographic surveys conducted in the areas of Old O-Field, J-Field, and Carroll Island. As manager, was responsible for survey content, detail, and plan consistency. As manager, was successful in

Key Projects (continued)

overseeing three topographic plans being developed over a three-month period. Later phases of project operations were concentrated on Old O-Field where, as manager, continued to implement field operations according to site-specific work plan. Additional responsibilities included site health and safety, quality control, subcontractor direction during potential chemical agent munition clearing for support areas and access road installation, roadway upgrading, and well development of existing site wells. Expected role for uncompleted phases of project will pertain to quality control of drilling operations, new extraction well installations, pump tests, piping installations, and water treatment plant construction. As quality control officer, will continue to prepare daily operation reports, oversee MINICAM™ real-time air monitoring operation during subsurface unexploded ordnance operations, and provide subcontractor direction for field crew operations.

Arsenic River Sediment Investigation, Vineland, NJ, Vineland Chemical, Site Manager. Managed the mobilization, installation, and operation of a prototype sediment separation unit. Project involved the removal, staging, and processing of arsenic-contaminated river bank sediment. Goal of project was to prove the client's theory that the arsenic contamination could be removed by separating the larger river sediment particles from the smaller noncontaminated river sediment particles. WESTON was successful in processing nine different percent solid/water slurry runs through a series of centrifuges. All solids and waters generated were recorded, sampled, and compiled for a final report which was provided to the client. Additional roles and responsibilities included project health and safety officer, quality control during production runs, and client and state agency interfacing on-site.

UST Remediation, Holyoke, MA, Mobil Chemical, Site Engineer. Project involved the removal and installation of four 50,000-gallon USTs, including pump houses and control rooms. Project also included the installation of two aboveground storage tanks (ASTs) and the in-place closure of six USTs. Quality control (QC) of specifications and drawings, preparation of daily reports, performance site monitoring (seismograph, surveying, personal protection equipment, and as-built information), and crew assistance.

Air Stripper Tower Removal/Installation, Perkasie, PA, Thomas and Betts Corporation, Project Engineer. Project involved the removal, disposal, and installation of a trichloroethylene (TCE) air stripper unit. Completed project engineering, site engineering, and disposal acceptance. Supervised on-site subcontractors.

Polychlorinated Biphenyls (PCB) Soil Remediation, Philadelphia, PA, Forest Electric Company, Site Engineer. Project involved the removal of PCB-contaminated soil and

Key Projects (continued)

concrete. Field assistance with backfilling and verifying compaction using Troxler nuclear compaction testing equipment. Prepared a compaction report.

UST Remediation, Pennsylvania, Allegheny Tunnel, Pennsylvania Turnpike, Site Engineer. Project involved the removal and installation of USTs at the east and west portals of the tunnel. Petroleum hydrocarbons in both the groundwater and surrounding soil resulted in disposal actions. Verification and demonstration of properly working leak detection system. Drafting of as-built installation drawings.

UST Remediation, Pennsylvania, Wyoming Valley Project, Pennsylvania Turnpike, Site Engineer. Project involved the removal and installation of three USTs with the construction of a new refueling island complete with an overhead canopy. Conducted testing and demonstration of refueling equipment, along with verification of properly operating leak detection systems. Drafting of as-built installation drawings.

UST Proposal, Paoli, PA, National Rolling Mills, Project Engineer. Project involved proposal writing for the removal of six USTs following the Pennsylvania Department of Environmental Resources (Pennsylvania DER) "Guidance for Underground Storage Systems in Pennsylvania Closure/Change in Service Site Assessment/Remediation." Proposal included a closed in-place UST located inside an existing structure.

UST Remediation, Allentown, Harrisburg, Holtwood, and Brunner Islands Projects, Pennsylvania Power and Light (PP&L), Project Engineer. Projects involved the removal and installation of five USTs and refueling islands. Completed certificates, notification of action, and closure reports. Frequently filled roles of Site Manager and Site Safety and Health Officer during project duration. Conducted testing and demonstration of properly working leak detection systems. Drafting of as-built installation drawings.

Closure of Resource Conservation and Recovery Act (RCRA) Tanks, Philadelphia Refinery, Chevron, Inc. USA, Project Engineer. Project included the demolition of three ASTs and the in-place closure of one separator pit. Field assistance with the in-place closure of a separator pit, including compaction testing using Troxler nuclear compaction testing equipment. Completed certificates and closure report.

PCB and Total Petroleum Hydrocarbon (TPH) Soil Remediation, Pennsylvania, Confidential Client, Project Engineer. Project involved the removal of PCB-contaminated soil and debris, the cleaning of a PCB-contaminated concrete floor, and the removal of TPH soil from an adjacent lot. Completed certificates, permits, and disposal acceptance. Wrote

Key Projects (continued)

a remedial action plan, a health and safety plan, and closure reports. Completed budgeting and cost tracking from start to finish.

Tank Farm Rehabilitation, Scranton, PA, Fitchburg Coated Products, Project Engineer. Project involved the removal of 11 USTs and the disposal of contaminants from the site. Managed the in-place closure of two 20,000-gallon fuel oil tanks and coordinated disposal activities. Prepared status and closure reports, and provided budgeting and cost tracking assistance for disposal activities.

Customer Support, Exton, PA, Netzsch Inc. USA, Service Engineer. Customer support in maintenance and repair of machinery sold and follow-up of projects to completion. Research and evaluation of equipment problems. Assembly of quotes, troubleshooting of electrical problems, and participation in startups of new machinery. Completion of site and field service reports, and establishment of a computerized parts list for each machine.

BRAD L. KINZY

Fields of Competence

Federal hazardous waste cleanup; construction supervision/inspection and field management; subsurface investigations; underground tank removals; bridge replacement; highway expansion.

Experience Summary

- Five years of experience in construction supervision and field management on federal and industrial projects at multiple sites.
- Field remediation supervisor on $15-million federal hazardous waste cleanup contract, responsible for ensuring field actions are in compliance with approved work plan; allocation of manpower, equipment, and materials resources; and coordination of site activities on concurrent projects.
- Provided construction inspection and management oversight on field operations including subsurface investigations, underground tank removals, bridge replacement, and highway expansion.
- Assisted in project scheduling and materials testing and inspection on major construction projects; responsible for supervising 80-tank removal operation for compliance with state and federal regulations.

Credentials

A.S., Construction and Surveying — University of Akron (1987)
OSHA 29 CFR 1910.120 Hazardous Materials
Site Worker Certification and Updates
OSHA 29 CFR 1910.120 On-Site Manager and Supervisor Training
Soil and Rock Inspection and Logging, Penn DOT

Employment History

1992-Present WESTON
1987-1991 R&R International Inc., Akron, OH

Key Projects

Superfund Cleanup, Aberdeen Proving Grounds, Aberdeen, MD, U.S. Army - G Street, Project Manager. Managed 12 technicians on the surface cleanup of 8 acres contaminated with chemical agents, gases, and bombs using Level A PPE. Surface cleanup included all

Key Projects (continued)

surface debris and numerous mounds of incinerated bombs. All debris were decontaminated, sampled, segregated, staged, and disposed of. All requirements of EPA, the state, OSHA, and other governing bodies were met.

Cleanup of Buried Drum Site, Aberdeen Proving Grounds, Aberdeen, MD, U.S. Army C.S.T.A., Project Manager. Managed the cleanup of a buried drum site, the contents of which were unknown. A magnetometer survey revealed 21 buried metallic objects which when uncovered turned out to be 55-gallon drums. Drums were located, excavated, identified, staged, sampled, and disposed of.

Underground Storage Tanks (USTs), Picatinny Arsenal, Dover, NJ, U.S. Army Corps of Engineers. Managed and coordinated all field activities during cleaning, removal, and disposal of USTs. The tanks were contaminated with chemicals including nitroglycerin and nitrocellulose. Sole point of contact with the client. All of OSHA, NIOSH, and regulations of other governing bodies were met.

Highway Test Borings, Pittsburgh, PA, Pittsburgh International Airport. The services required for this project included advancing 68 test borings for a new section of an Interstate Highway. The site was formerly a landfill and all operations were monitored and conducted using appropriate levels of personal protective equipment (PPE). Boring logs were kept and soil and rock samples obtained for laboratory testing.

Removal of USTs, Cleveland, OH, Stouffer Playfield. A total of eight USTs were removed from a former dump site of the late 1800s. Special safety precautions were taken due to the depth of the rubbish. Duties included obtaining all samples and managing three inspectors daily.

Bridge Replacement Project, Wooster, OH, R.E. Warner & Associates, Project Manager. Duties included supervising the advancement of test borings, inspecting and logging soil and rock core samples, and preparing the final report which included recommendations.

Health and Safety Plan, Ravenna Arsenal, Ravenna, OH, U.S. Army, Project Manager. Was a main source of input for the Project Management Information System (PMIS). Duties included coordinating work schedules with the Army due to the high security and following all state and federal regulations.

Construction Projects, Cleveland, OH, NASA Lewis Research Center. Managed and coordinated inspection and testing on all construction projects within the facility. Services

Key Projects (continued)

included working with the project engineer on compliance within specifications and checking progress to verify compliance.

Construction Inspection, Cleveland, OH, Cleveland Hopkins Airport. Project involved construction inspection during the placement of runway pavement that consisted of both asphalt and concrete; conducting compaction tests, taking random samples, and providing quality control and quality assurance. Special scheduling was necessary because part of the airport remained open during construction. Other duties included coordination and scheduling of technicians and providing liaison with the contractors during construction, and also testing of asphalt, concrete, soil, and steel including inspection of labor placement in accordance with the design plans.

Sewer Construction, Elyria, OH, Elyria Sewer. This project consisted of constructing several miles of sewer ranging from 8-inch- up to 36-inch-diameter pipe. The primary duties involved in the project included providing inspection of sewer and backfill, placements, checking compaction of backfill materials, and compliance with construction specifications. Several sections of the highway pavement had to be replaced where damaged. Additional services included testing of materials and inspection of placement of base and roadway pavement.

UST Removal, Aberdeen, MD, Project Manager. Project involved removal of 80 USTs. Sole point of contact with the client. Duties included utilizing knowledge of OSHA, NIOSH, and COMAR regulations. Supervised and confined space entry, triple rinsing, cold cutting, decontamination, staging, and disposal of the tanks and their contents. Tank sizes ranged from 500 gallons to 25,000 gallons.

JOHN M. COOK

Registration

Certified Site Safety and Health Coordinator for Level "B" Operations, WESTON (1990)
Certified Underground Storage Tank (UST) Tester via the Acutest System, Acutest (1990)

Fields of Competence

Hazardous waste site remediation management, site health and safety supervision, UST removal and installation, and heavy equipment operation.

Experience Summary

- Site manager for WESTON. Supervisor of UST removal and installation projects, as well as facility decontamination and demolition.
- Site health and safety officer for hazardous waste remediation projects.
- Six years of experience as a quality control (QC) inspector for a heavy equipment manufacturer.
- Sixteen years of experience as a heavy equipment operator.

Credentials

40-Hour Hazardous Waste Operations Training in Accordance With OSHA's Hazardous Waste Regulations (29 CFR 1910.120), WESTON

Employment History

1990-Present WESTON
1975-1990 Various Employers, Heavy Equipment Operation and QC Inspector

Key Projects

Containment and Treatment of Contaminated Groundwater at Old O-Field, Aberdeen Proving Ground, Edgewood, MD, U.S. Army Corps of Engineers, Site Health and Safety Officer. Responsible for implementation and compliance of Health and Safety Plan during well development activities. Future activities include hand auguring and well drilling, extraction well installation, pump testing, and treatment plant construction.

Lagoon Closure, Morris, IL, Quantum Chemical Site, Health and Safety Officer/Crew Chief. Responsible for implementation and compliance of Health and Safety Plan on a

Key Projects (continued)

lagoon closure project consisting of 6 lagoons covering 40 acres. Supervised work crew of 4 equipment operators and 1 technician during sludge stabilization and removal activities.

Lagoon Closure, Roanoke, IN, Township of Roanoke, Site Health and Safety Officer/Equipment Operator. Responsible for implementation and compliance of Health and Safety Plan on a wastewater treatment lagoon project involving sludge solidification and containment cell construction. Operated heavy equipment with subcontractor during solidification of 5,000 yd^3 of sludge and supervised subcontractor during containment cell construction.

Facility Remediation, Adrian, MI, Anderson Development Co., Site Health and Safety Officer. Responsible for implementation and compliance of Health and Safety Plan during operations of a 24 hour/7 day per week, 10-man crew project for the remediation of a chemically contaminated lagoon involving heavy equipment and low temperature incineration plant operations.

Tank Farm Rehabilitation, Scranton, PA, Fitchburg Coated Products, Heavy Equipment Operator. Operated hydraulic excavator, assisted in the cleaning and removal of six USTs, and in the excavation and stockpiling of contaminated soils.

UST Remediation, Lancaster, PA, Armstrong World Industries, Heavy Equipment Operator. Involved in the cleaning and removal of 20 USTs and the in-place closure of 8 USTs. Assisted in the excavation and stockpiling of contaminated soils.

Polychlorinated Biphenyl (PCB) Facility Decontamination, Scranton, PA, Pennsylvania Power and Light (PP&L), Crew Chief. Supervised work crews decontaminating a decommissioned electric generating facility (coal-fired steam) slated for demolition. Work included decontaminating a 65,000-volt generator, transmission, three aircraft-type turbine engines, the control room, and all equipment related to the process of generating electricity.

UST Remediation, Scranton, PA, Pennsylvania Turnpike Authority, Site Manager. Scheduled and supervised work crew and subcontractors on a project involving the removal of four USTs, the installation of three USTs with piping, and the construction of a new refueling island with computer management control and tank monitoring equipment. Responsible for scheduling materials and equipment, disposal of hazardous material, and handling site health and safety officer duties.

UST Remediation, Harrisburg, Holtwood and Brunner Island Projects, PP&L, Site Manager. Scheduled and supervised work crew and subcontractors on projects that involved

Key Projects (continued)

cleaning, removing, and installing USTs. Work included the construction of new refueling islands and tank monitoring equipment, scheduling of equipment and materials, and the disposal of hazardous material and contaminated soils.

UST Remediation, Dover, NJ, Day International, Site Manager. Supervised subcontractors cleaning and removing eight aboveground and five underground chemical storage tanks on a Superfund site. Responsible for site health and safety duties.

Facility Remediation, Picatinny, NJ, U.S. Army Corps of Engineers (USACE), Site Health and Safety Officer. Responsible for the implementation and compliance of a site health and safety plan on 15 delivery orders involving decontamination, demolition, and disposal of an explosives manufacturing facility, including the remediation of 18 aboveground storage tanks (ASTs) and 3 USTs.

UST Remediation, Newtown, PA, Dunmore Corporation, Site Manager. Supervised and scheduled subcontractors on a turnkey tank farm project involving the removal and installation of four USTs, delivery piping, and tank monitoring equipment. Responsible for soil sampling, hazardous material disposal, and implementation of the site health and safety plan.

Facility Remediation, Edgewood/Aberdeen, MD, USACE, Site Health and Safety Officer. Responsible for site health and safety duties on one delivery order involving the sampling of one UST containing hazardous material.

JOSEPH D. GERMAN

Fields of Competence

Construction activities for industrial, municipal, and private clients. Positions held include: foreman, site supervisor, surveyor, cost estimator, and heavy equipment operator.

Experience Summary

- More than 14 years of experience in the construction industry. Projects have involved civil, mechanical, electrical, concrete, and utility specialties.
- Owned/operated D. German Construction Company for 8 years.
- Two years of hazardous waste site experience, including 40-hour health and safety training, CPR, and first aid.

Credentials

40-Hour OSHA Health and Safety Training, WESTON (1991)
Site Health and Safety Coordinator Training, WESTON (1991)
Overhead Cost Analysis Seminars (1987-1988)

Employment History

1991-Present WESTON
1977-1991 D. German Construction Company, Inc.

Key Projects

Underground Storage Tank (UST) Replacement Project, Massachusetts, Mobil Chemical Company, Equipment Operator/Field Safety Supervisor/Surveyor. Assisted in the removal and replacement of four 50,000-gallon underground chemical storage tanks. Work performed included excavation, staging, grading, and screening of soil. Performed various tasks in Level C personal protection equipment (PPE). Oversight of subcontractors, including mechanical, electrical, concrete, steel erectors, and pile drivers. In addition, performed various site surveying work.

Groundwater Recovery System, Connecticut, Robertshaw Controls Company, Equipment Operator/Surveyor. Assisted in the closure and construction of a multilayered cap and the installation of a groundwater recovery and water treatment system. Installed stormwater structures, concrete retaining walls and slabs, rough and finish grading, and site restoration.

JOSEPH D. GERMAN
(continued)

Key Projects (continued)

Construction Site Work, Connecticut, E.I., Inc., Foreman/Estimator/Surveyor. Complete site work for a three-story office building. Included the excavation and backfilling of the foundation, installation of site utilities, construction of a paved parking lot, concrete sidewalks, and curbs. In addition, installation of a 75-ft bridge and finish grading of the site.

Construction Site Work, Connecticut, Seppala & Aho, Inc., Foreman/Surveyor/Estimator. Complete site work of four-story Comfort Inn. Project involved the excavation and backfilling of the foundation, and installation of drainage and sewer structures. In addition, conducted excavation for buried electrical utilities, erection of site lighting, and grading of the parking lot.

Construction Site Work, Connecticut, The Preload Company Foreman, Surveyor, Bid Proposal, Equipment Operator. Billing and project budget. Excavation for two 100-ft-diameter concrete water cooling tanks for the Connecticut Light and Power Company. Work included site excavation, backfilling, removing old utilities, 24-hour dewatering on-site, and excavation of fabrication molds for concrete side walls.

Force Main/Sewer Installation, Connecticut, Agro Builders and Developers, Foreman, Bid Proposal, Surveyor, Equipment Operator. Billing and project budget. Installation of 2-inch forced main sewer, 600 ft with two manholes. Work included street excavation and backfilling, tunneling approximately 40 ft with metal casing, and cutting, repaving, and relandscaping the roadway.

Sewer Pipe Installation, Connecticut, Private Client, Foreman, Bidding/Estimating/Billing, Project Budget Surveyor, Equipment Operator. Installation of gravity sewer (500 ft of 8-inch pipe) with three manholes. Work included excavation, backfill, compaction control, pipe lazer setup, and cutting, repaving, and relandscaping the roadway.

Installation of Site Utilities, Connecticut, Private Client, Foreman, Estimator, Surveyor, Project Budget, Equipment Operator. Excavation and installation of 15-, 24-, 30-, and 36-inch concrete pipe, 8- and 6-inch sewer pipe with four manholes, and 6-inch duct iron pipe for fire service for a large commercial shopping center project. Work included excavation and backfill, compaction control for trenches up to 20 inches in depth, and pipe lazer setup. Excavation and backfill of concrete foundations.

Installation and Design of Site Utilities, Connecticut, Germans Plaza, Foreman, Project Budget, Surveying, Equipment Operation. Excavation and design for a parking lot expansion, damage system, site lighting and electrical conduits, and 400 ft of 8-inch sanitary

Key Projects (continued)

sewer line with two manholes. Supervised the paving subcontractor, plus installed 300 ft of concrete curbs and walkways.

Installation and Design for Residential and Small Commercial Sewer Materials. Involved curtain drains, water lines, septic systems and foundations, finish and rough grading, etc.

LIST OF TABLES

LIST OF FIGURES

SECTION 3

CONTRACTOR QUALITY CONTROL PLAN

TABLE OF CONTENTS

3.3.2 Contractor DO Project Manager

The Contractor DO Project Manager is accountable for the site-specific planning, coordinating, and administrating of task-specific activities in accordance with the requirements of DO No. 10. The Contractor DO Project Manager shall document removal actions by reviewing the SSWP and supporting documents, overseeing task performance, identifying task planning and resource requirements, and reviewing technical documents. Ms. Jeanne O'Leary shall serve as the Contractor DO Project Manager.

3.3.3 Contractor Program QC Manager

The Contractor Program QC Manager shall ensure appropriate implementation of all aspects of the CQCP and associated contract requirements. In this capacity, the Program QC Manager shall:

- Assign and schedule all personnel and resources necessary to conduct QC activities.
- Oversee the activities of the Project Health and Safety/QA/QC Officer.

Mr. Joseph Barco, P.E., shall serve as the Program QC Manager for the activities associated with DO No. 10. REPLACE

3.3.4 Contractor Project Health and Safety/QA/QC Officer

The Project Health and Safety/QA/QC Officer is accountable for ensuring that project activities conform to the requirements of the SHERP and CQCP. In this capacity, the Project Health and Safety/QA/QC Officer shall perform the following duties relative to implementation of the CQCP:

- Ensure that appropriate methods of QC inspection, testing, and documentation are followed by the QC staff.
- Process, approve, and oversee preparation of all QC submittals, including vendor data, test results, and documentation, as required by the contract.
- Provide periodic CQCP compliance audits (as described in Subsection 3.6).

Mr. Michael Harmer, P.E., shall serve as the Project Health and Safety/QA/QC Officer for DO No. 10.

SECTION 3

CONTRACTOR QUALITY CONTROL PLAN

3.1 OVERVIEW

This Contractor Quality Control Plan (CQCP) was developed to identify and implement quality requirements to ensure that project activities are conducted in a manner consistent with the nature and importance of the services requested. It was prepared in compliance with the DO No. 10 Statement of Work for Remediation Services, Subsection 3.2.3, entitled Contractor Quality Control Plan (CQCP). REPLACE

This plan was also prepared to ensure that all work is accomplished with an acceptable level of internal controls and review procedures, which will eliminate conflicts, errors, and omissions, and also shall ensure the technical accuracy of all deliverables. This plan was prepared with guidance from Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, and OTS Guidance Document for the Preparation of Quality Assurance Project Plans, 9 September 1987.

3.2 SCOPE

The scope of this plan provides QC measures applicable to all removal actions defined by DO No. 10. This plan is to be applied to the project administrative, engineering, and technical activities associated with the products and services for APG. The requirements of this plan also are applicable to all WESTON-affiliated project support groups and their contractors and subcontractors unless an alternate QC plan, which is consistent with or exceeds the requirements of this document either in whole or in part, is used.

3.3 CONTRACTOR PROJECT RESPONSIBILITIES

Under the direction of CEAAO, WESTON is accountable for implementation of the tasks in DO No. 10. The subsections that follow present WESTON's QC responsibilities and key personnel. These personnel possess the technical and managerial qualifications necessary to efficiently fulfill the requirements of the positions.

3.3.1 Contractor Program Manager

The Contractor Program Manager is accountable for establishing and executing project administrative matters, project controls, project-related policy matters, and project levels of authority, responsibility, and communication. Mr. Peter A. Ciotoli, AICP, shall serve as the Contractor Program Manager.

Table 3-1

Removal Actions for DO No. 10

Objective	Activity	Activity Quality Requirement	QC Verification
Conduct removal actions at each vault and remove stained/contaminated soils.	Mobilization.	Mobilize equipment and personnel according to the Technical Approach and the SHERP.	Daily Time and Materials Report
	Site preparation/establish site control.	Implement control measures according to the SHERP.	Daily Time and Materials Report
	Remove water and sediment from the vaults.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report; manifests; bill-of-lading; labels
	Seal vault walls with an epoxy coating.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report
	Remove aboveground structure of the vaults.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report
	Backfill the vaults.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report
	Remove visibly stained soil around the vaults, soil in the area of B-2 and B-3, and in the area of MW-2.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report; chain-of-custody; manifests; bill-of-lading; labels
	Sample excavated soils and excavation areas.	Implement procedures in the SHERP and the FSAP.	Daily Time and Materials Report; chain-of-custody; field data sheets; QA/QC samples
	Dispose of staged equipment and materials.	Implement procedures in the Technical Approach and the SHERP.	Daily Time and Materials Report; chain-of-custody; manifests; bill-of-lading; labels
	Site restoration.	Restore and regrade the site to match the surroundings or existing conditions.	Daily Time and Materials Report
	Demobilization.	Demobilize equipment and personnel in a timely and efficient manner in accordance with the Technical Approach and the SHERP.	Daily Time and Materials Report

3.3.5 Contractor Site QA/QC Officer

The Contractor Site QA/QC Officer is accountable for ensuring that field activities are conducted in accordance with the CQCP and the contract. The Site QA/QC Officer shall also serve as the principal field authority and focal point of WESTON's management system for ensuring that quality work is produced. This shall include ensuring that:

- Construction materials meet proper specifications.
- Debris and overpack drums are labeled and staged accordingly.
- Field sampling, monitoring, and analysis processes are performed in conformance with the FSAP (Section 5).

WESTON has a pool of qualified personnel who can fill the position of Site QA/QC Officer. This position shall be filled prior to the start of fieldwork. Resumes for some of the prospective personnel for this position are contained in Attachment 2-1.

3.3.6 Contractor Site Engineer

The Contractor Site Engineer shall supervise all of the field activities of each task of DO No. 10. The Contractor Site Engineer shall ensure that the removal actions conform to the requirements of the SSWP. Site-specific field responsibilities shall include confirmation of the proper installation of engineering control measures; procurement of all permits; and conformance to all site safety, security, and government guidance documents and regulations. Mr. Mike Mazelon shall serve as the Contractor Site Engineer for DO No. 10. WESTON has a pool of qualified personnel who can be used in the event Mr. Mazelon is unavailable. Resumes for some of the prospective personnel for this position are contained in Attachment 2-1.

3.4 FIELD ACTIVITIES

3.4.1 Quality Requirements

The quality requirements associated with field activities in support of this DO are defined in Table 3-1. These requirements apply to all field activities that affect the quality of work and work products. The quality requirements associated with sampling and analysis are identified in Section 5, the FSAP. The approved FSAP shall be followed for these removal actions, except where field conditions have changed, making it impossible or impractical to do so.

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT

ROY F. WESTON, INC.

Contract No. DACA87-90-D-0031

DAILY TIME AND MATERIALS REPORT

PROJECT TITLE:_____ DATE: _____

DELIVERY ORDER NO. ___ WESTON WORK ORDER NO. _____

DSHE PROJECT OFFICER: _____

WEATHER: _____

TEMPERATURE: _____

WESTON PERSONNEL:

NAME	TITLE	HRS THIS DATE

SUBCONTRACTOR PERSONNEL:

COMPANY	NAME	TITLE	HOURS

PAGE ___ OF ___

QA checks will be conducted as follows:

- Daily Briefings — The Site QA/QC Officer shall ensure that daily safety and operational briefings are conducted. The Site QA/QC Officer shall accomplish this by personally observing or conducting the briefings.

- Communications — Positive communications shall be maintained throughout the workday:

  - Communication checks shall be conducted each morning prior to starting work, after the lunch break, and following any period of prolonged interruption of operations.

  - Teams shall not start operations until satisfactory checks have been achieved.

- Training — The Project Health and Safety/QA/QC Officer shall ensure that initial site training is performed and that follow-up or refresher training is conducted, when required:

  - Training shall be accomplished using only approved training materials and lesson guides.

  - Refresher training shall be conducted when random observations detect a lack of understanding or failure to comply with standard safety or operational procedures.

- Documentation — The Site QA/QC Officer shall ensure the completion and accuracy of all documentation.

3.4.2 Field Documentation

All field activities affecting quality shall be performed in accordance with documented procedures, instructions, or drawings identified in the DO. During field activities, WESTON shall use the following reporting formats:

- Daily Time and Materials Report (Figure 3-1).
- Preparatory Inspection Report Form (Figure 3-2).
- Initial/Follow-Up/Completion Report Form (Figure 3-3).

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT (CONTINUED)

DAILY TIME AND MATERIALS REPORT **Date:** _____

VERBAL/WRITTEN DIRECTION RECEIVED THIS DATE:
(Indicate person(s) giving direction)

SAMPLING PERFORMED: YES NO (CIRCLE ONE)

IF YES, SUMMARIZE BELOW:
(Include No. of samples, location collected, Laboratories involved, analytical parameters, and names of samplers)

MATERIALS RECEIVED/PURCHASED THIS DATE: YES NO (CIRCLE ONE)

IF YES, SPECIFY: (Include vendor's name, material received, quantity, and whether it was purchased)

PAGE ___ OF ___

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT FORM (CONTINUED)

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT (CONTINUED)

DAILY TIME AND MATERIALS REPORT **Date:** _____

HEALTH & SAFETY SUMMARY:

WORK PERFORMED: _____

ANY DELAYS THIS DATE: YES NO (CIRCLE ONE)

IF YES, WHY? _____

PAGE ___ OF ___

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT FORM (CONTINUED)

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT (CONTINUED)

DAILY TIME AND MATERIALS REPORT	Date: _____

OTHER COMMENTS/REMARKS:

_____ WESTON REPRESENTATIVE

_____ CEAAO REPRESENTATIVE

_____ DATE

_____ DATE

PAGE ___ OF ___

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT FORM (CONTINUED)

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT (CONTINUED)

DAILY TIME AND MATERIALS REPORT Date: _____

WASTE SUMMARY:

A) WASTE GENERATED THIS DATE: (i.e., boxes, drums, other)

B) TOTAL(S) TO DATE:

VISITORS:

NAME	REPRESENTING

PAGE ___ OF ___

FIGURE 3-1 DAILY TIME AND MATERIALS REPORT FORM (CONTINUED)

PREPARATORY INSPECTION REPORT FORM
(continued)

Quality requirements/safety reviewed with workers: __ Yes __ No

Note: List workers or explain "No": _____

Field dimensions verified and CEAAO advised of all discrepancies: ____ Yes ____ No

Describe or explain "No": _____

Deficiencies	Corrective Actions Required	Completion Date

Reviewed by:

1. _____ Date _____
2. _____ Date _____
3. _____ Date _____

FIGURE 3-2 PREPARATORY INSPECTION REPORT FORM (CONTINUED)

WESTON QUALITY CONTROL INSPECTION REPORT

PREPARATORY INSPECTION

Project: _____ Project No.: _____
Date: _____ Time: _____ Work Element: _____
Inspector's Name: _____ Signature: _____
Review of contract requirements made: _____ __ Yes __ No
Note: Reference section of contract; explain "No": _____

Foreman responsible for conducting the work: _____

Check to ensure materials and/or equipment have been tested or vendor data submitted and approved, conform to approved shop drawings or submittal data, and are on hand:

Note: List materials and/or equipment; explain "No": __ Yes __ No

_____

_____

Provisions made for control testing: __ Yes __ No

Note: Describe or explain "No": _____

_____

_____

Work area examined, all preliminary work complete: __ Yes __ No

Note: Describe condition, list preliminary work; explain "No": _____

_____

_____

Safety concerns reviewed: __ Yes __ No

Note: Describe or explain "No": _____

_____

_____

_____

FIGURE 3-2 PREPARATORY INSPECTION REPORT FORM

These reports shall be used to document CQC activities. Related laboratory test reports and vendor data shall be attached to these QC reports when daily work activities are associated with these data.

WESTON inspection and field test technicians shall maintain field logbooks of their inspection and test activities. WESTON's Site QA/QC Officer shall review these logbooks on a periodic basis to ensure appropriate individual documentation. These daily logbooks shall be used in preparing the Daily Time and Materials Report Form. Video documentation of the activities may also be conducted, if permitted. The Daily Time and Materials Report for the previous day's activities shall be submitted to CEAAO in a timely manner.

3.5 FIELD INSPECTIONS

A three-phase inspection schedule shall be implemented for this DO, if necessary. This schedule shall include a preparatory inspection, an initial inspection, and a follow-up inspection, if needed. Particular emphasis shall be placed on inspections of work zone maintenance, demolition, staging areas, and representative sample locations. Emphasis shall also be placed on location and verification of underground utilities and structures. All inspections shall be documented in a bound field notebook, and shall be available for review by CEAAO and APG authorities.

3.5.1 Preparatory Inspections

A preparatory inspection shall be conducted by qualified CQC personnel. In general, the preparatory inspections shall require that QC personnel:

- Review submittal requirements and all other contract requirements with the site engineer directly responsible for performing the work.
- Check/schedule provisions to conduct required field QC testing.
- Examine the work area to determine that all preliminary work has been completed.
- Verify all field dimensions.
- Perform a physical examination of materials and equipment to ensure conformance with shop drawings, vendor data, or submittal data, and that all equipment/materials are on-hand.
- Provide an Activity Hazard Analysis (AHA) for each definable feature of work (this is to be provided in a format acceptable to CEAAO).

REPLACE

INITIAL/FOLLOW-UP/COMPLETION REPORT

Client: _____ DO No.: _____ Contract No.: _____
Date: _____ Time: _____ Work Element: _____
Inspector's Name: _____ Signature: _____

Describe status of work element, estimate percent complete, note workmanship, the use of defective or damaged materials, omissions, and dimensional inconsistencies: _____

_____

_____

Control testing results: _____

Note: List tests conducted, attach testing documentation form for each test conducted, and describe test results: _____

_____

_____

_____

_____

Deficiencies	Corrective Actions Required	Completion Date

_____

Reviewed by:

1. _____ Date _____
2. _____ Date _____
3. _____ Date _____

FIGURE 3-3 INITIAL/FOLLOW-UP/COMPLETION REPORT FORM

- Provide documentation that the required permits have been acquired prior to initiating fieldwork and that DPW has been notified.

Each inspection shall be documented on the Preparatory Inspection Report Form (see Figure 3-2).

3.5.2 Initial Inspection

An initial inspection shall be conducted at the start of work on a representative portion or all of the total work phases. It shall include an examination of the quality of workmanship, as well as a review of control testing for compliance with contract requirements. Initial inspections shall be documented on the Initial/Follow-Up/Completion Report Form (see Figure 3-3). Currently, WESTON shall only notify CEAAO, but would expect other agency participation.

3.5.3 Follow-Up Inspections

Follow-up inspections shall be conducted as required to ensure periodic quality checks. Particular emphasis shall be placed on locating and correcting any deficiencies in field implementation. If deficiencies are found, appropriate revisions shall be made to the QC program to ensure that these problems do not recur. Follow-up inspections shall be documented on the Initial/Follow-Up/Completion Report Form (see Figure 3-3).

3.6 AUDITS

Field performance shall be evaluated to ensure that the quality standards and objectives of the SSWP are met. The evaluation shall be accomplished through audits, and corrective action shall be implemented. Audits shall be conducted and corrective action shall be implemented when nonconformances or deficiencies are identified. Additional audits shall be conducted periodically, as needed. The audits shall be planned and conducted by the Program QC Manager, the Program Safety Manager, and/or the Project Health and Safety/QA/QC Officer, and clearly defined before they are initiated. Procedures for auditing activities shall be identified prior to implementation of the audits. The audits shall identify nonconformances or deficiencies, report and document them, initiate corrective action through appropriate channels, and follow up with a compliance review. Records shall be kept of all auditing tasks and findings.

In addition to audits, the field teams involved with the removal actions are responsible for reporting all suspected technical nonconformances or deficiencies to the Program QC Manager and/or the Project Health and Safety/QA/QC Officer. The Program QC Manager and/or the Project Health and Safety/QA/QC Officer is accountable for evaluating the situation and taking action, if any is required.

SHERP APPROVALS

By their specific signature, the undersigned certify that this site-specific SHERP is approved for utilization during all site activities at:

Project: Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, MD
WESTON Project Number: 03886-071-009
Delivery Order Number: 10

Signature, Name, Title

CEAAO Robert P. Rizzieri, P.E.	Date
APG/DSHE/EMB Kenneth Stachiw	Date
APG/DSHE/ISD Richard Albins	Date
USACE Baltimore District Cheryl Mazzella, CIH	Date
Program Manager Peter A. Ciotoli, AICP	Date
Delivery Order Project Manager Jeanne O'Leary, CHMM	Date
Project Health and Safety/QA/QC Officer Michael Harmer, P.E.	Date
Certified Industrial Hygienist George Crawford, CIH	Date

SHERP ACKNOWLEDGEMENTS

All field personnel shall sign this section after site-specific training is completed and before being permitted to work on the site.

I have read and understood this site-specific SHERP. I understand the information presented in it and will comply with the provisions contained herein.

Project: Adamsite Storage Vaults at Edgewood Area, Aberdeen Proving Ground, Maryland

Name (printed)	Signature	Date

SECTION 4

SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN (SHERP)

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

SECTION 4

SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN (SHERP)

4.1 INTRODUCTION

CEAAO has tasked WESTON to provide removal actions at Building E-2370, the former Adamsite Storage Vaults, which is located in Edgewood at the Bush River Research Operations Area of APG, under Contract No. DACA87-90-D-0031. In support of this effort, WESTON shall provide services, including, but not limited to, environmental investigation, laboratory services, and removal activities. Figure 4-1 indicates the location of the site, and Figure 4-2 is an artist's sketch of the vaults. REPLACE

4.1.1 Scope and Applicability of SHERP

The purpose of this SHERP is to define the requirements and designate protocols to be followed at APG during DO No. 10 scope of work activities to be conducted by WESTON. It is intended to establish the minimum requirements to maintain safe working conditions and to safeguard employees, the public, and the environment. The SHERP applies to all persons entering the site boundaries, including government employees, contractors, subcontractors, and visitors, during those activities.

Relevant sections of this plan must be reviewed and a written acknowledgement must be signed by all personnel prior to entering the defined WESTON exclusion zone or the contamination reduction zone. This document and the resulting list of signatures shall be maintained on-site until the completion of WESTON activities.

4.1.2 Relationship With Other Standards and Guidelines

All persons on-site shall execute their duties at all times in full compliance with the following standards and guidelines:

- OSHA Safety and Health Regulations for Construction (29 CFR 1926).
- OSHA Regulations for General Industry (29 CFR 1910):
  - Personnel protection: 29 CFR 1910.132-140.
  - Air monitoring for lead and arsenic: 29 CFR 1910.1000.
  - Ladders: 29 CFR 1910.26.
  - Manlifts: 29 CFR 1910.67 and 1910.68.
  - Cutting and welding: 29 CFR 1910.120.
  - Tool use: 29 CFR 1910.120.

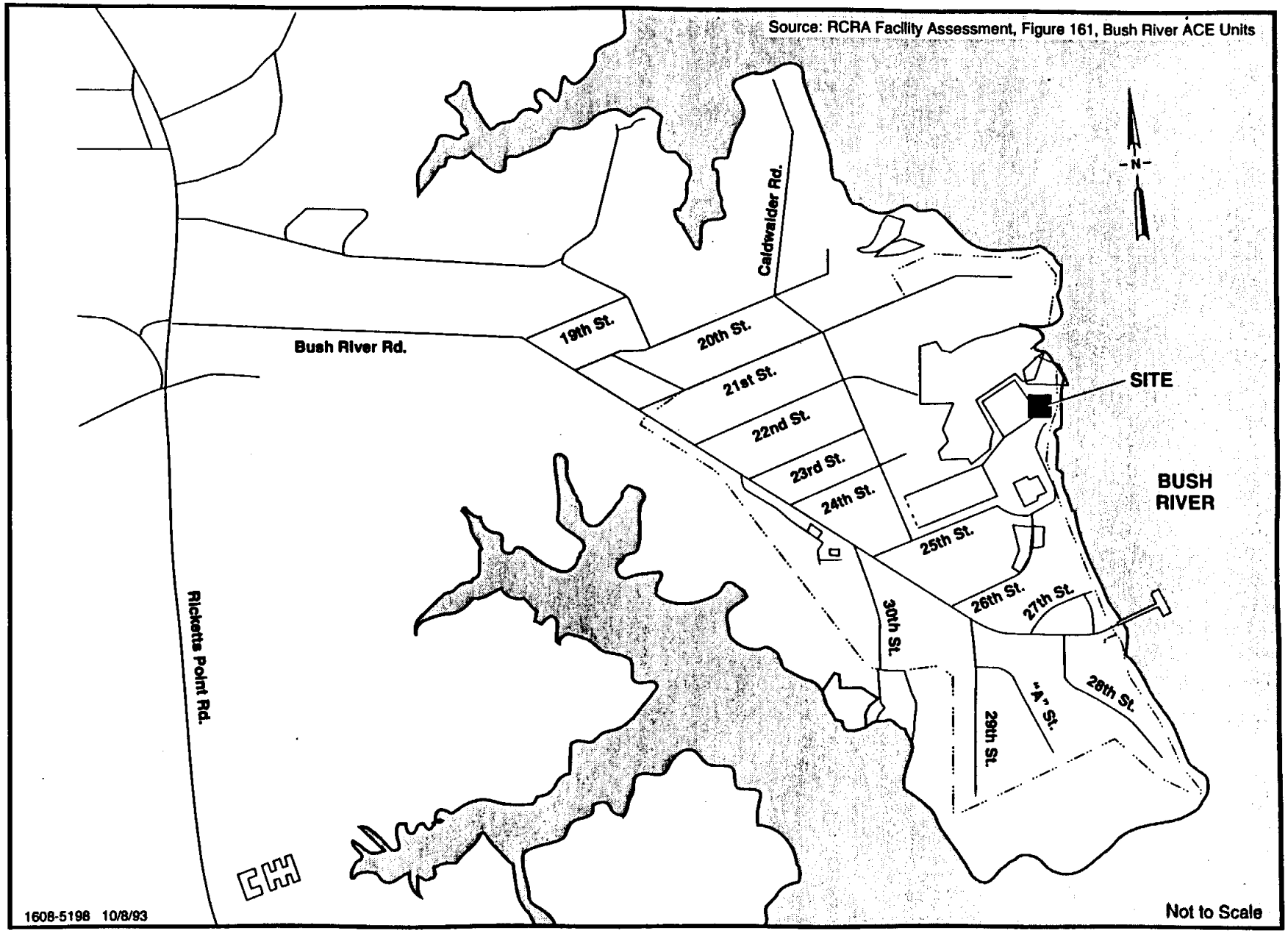
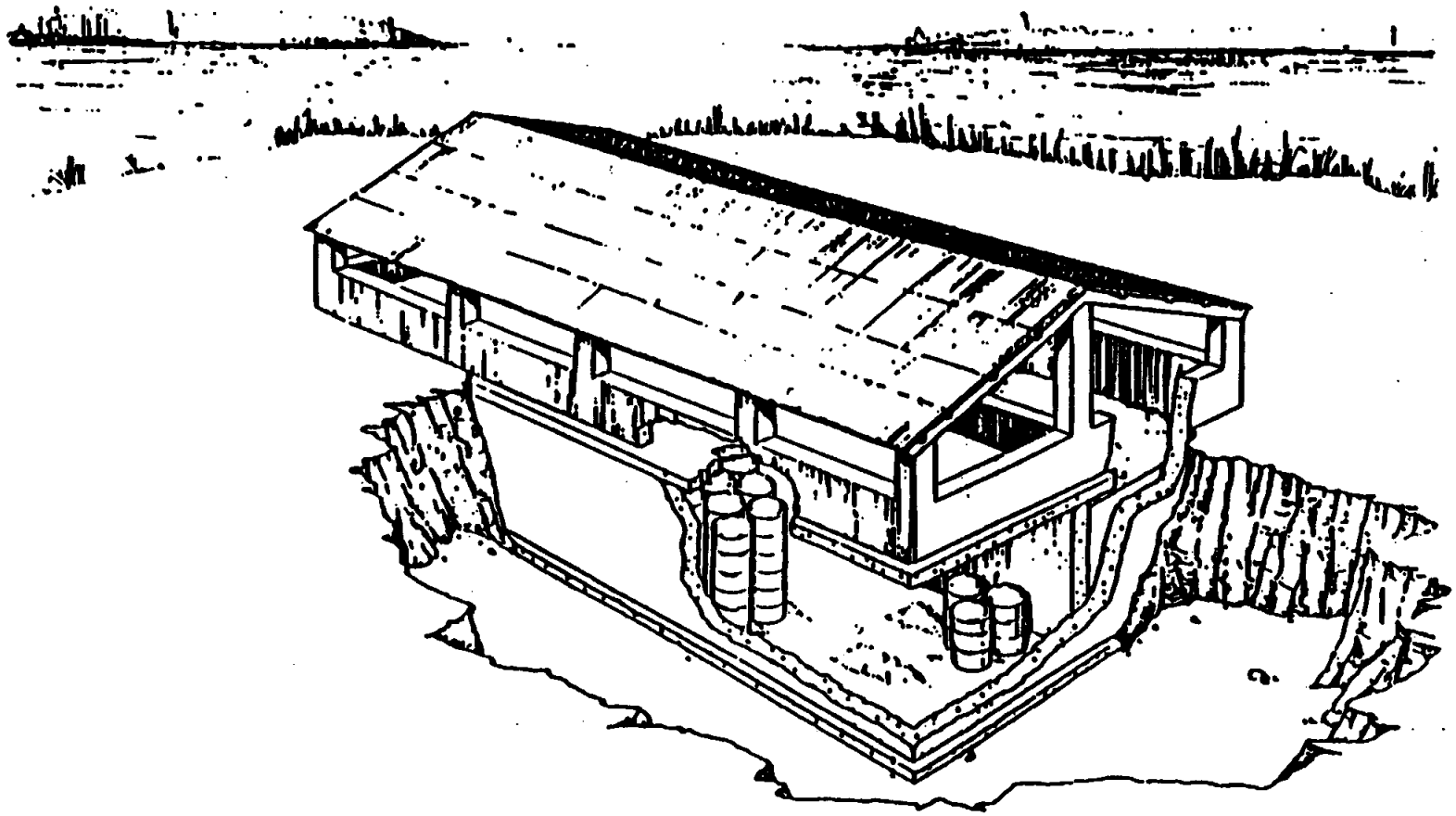


FIGURE 4-1 SITE LOCATION MAP, BUSH RIVER RESEARCH OPERATION AREA, ADAMSITE STORAGE VAULTS, APG, MD



Source: Baltimore District USACE Technical Report, ARCSL-TR-77050, June 1977

1595-5088 9/17/93

FIGURE 4-2 ARTIST'S SKETCH OF DRUMS PREVIOUSLY STORED IN BUILDING E-2370

- WESTON Health and Safety Guidelines.
- OSHA Regulations for Hazardous Waste Operations and Emergency Response (29 CFR 1910.120).
- AR 385-61, The Army Toxic Chemical Agent Safety Program.
- EM 385-1-1 USACE Safety and Health Requirements Manual (October 1990).

The SHERP has been designed to be consistent with each of these documents.

4.1.3 Visitors

All visitors entering the defined WESTON exclusion zone or the contamination reduction zone shall be required to read and verify that they shall comply with the provisions of this SHERP. In addition, visitors shall be expected to comply with relevant OSHA requirements, such as medical monitoring (Subsection 4.8), training (Subsection 4.9), and respiratory protection (Subsection 4.5).

4.2 ORGANIZATION/ADMINISTRATION

4.2.1 Responsibilities for Safety Activities/Procedures

4.2.1.1 Site Safety and Health Officer (SSHO)/Qualifications

The SSHO is accountable for ensuring that the provisions of this SHERP are implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs; therefore, it is vital that the person assigned as SSHO be experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

This position is to be filled by one of WESTON's qualified and approved SSHOs, who meets all of the requirements for this position, as stated in the contract. Resumes for personnel capable of filling this position are contained in Attachment 2-1 of this SSWP.

4.2.1.2 CIH/Qualifications

Mr. George Crawford shall serve as WESTON's CIH for the APG project. Mr. Crawford has more than 24 years of experience in managing environmental health and safety programs, industrial hygiene programs, and emergency response programs for a variety of project sites, including hazardous waste sites. His qualifications are presented in Attachment A-1 of the Standard Supplement.

4.2.1.3 Project Health and Safety/QA/QC Officer/Qualifications

The Project Health and Safety/QA/QC Officer is accountable for ensuring that the field activities conform to the provisions of the SHERP and the CQCP. In addition to the QA/QC duties (as presented in Section 3), the Project Health and Safety/QA/QC Officer shall be accountable for review and approval oversight and QC related to creation, administration, and implementation of the SHERP and its components. Mr. Michael Harmer, P.E., shall serve as the DO No. 10 overall Project Health and Safety/QA/QC Officer. His resume is contained in Attachment 2-1 of this SSWP.

4.2.1.4 Project Staff/Training

The 29 CFR 1910.120(e)(3)(1) initial and 8-hour refresher training dates for the project staff are as follows:

- D. Klebes — 5/4/90 (8-hour, 11/11/93).
- M. Harmer — 11/4/88 (8-hour, 8/19/93).
- M. Mazelon — 11/22/85 (8-hour, 4/19/93).

4.2.2 Chain-of-Command

The SSHO has the authority to stop work at any time if there is a violation of the plan and/or a condition that could result in personal harm or exposure. If such an incident occurs, work stoppage shall continue until the problem has been resolved and CEAAO and DSHE have been notified. All incidents and work stoppages must be reported to the CIH as soon as possible, but no later than 24 hours after occurrence. Figure 4-3 outlines the health and safety chain-of-command and organization.

4.2.3 First Aid/Cardiopulmonary Resuscitation (CPR) Personnel

At least one first aid/CPR-trained (certified by an OSHA-recognized organization) team member shall remain on-site during all phases of fieldwork. WESTON's policy requires that the SSHO be first aid/CPR-certified and meet all of the requirements for the SSHO per 29 CFR 1910.120 and this contract, Section C, paragraph 11.1.3.

4.2.4 Subcontractor Personnel

All subcontractors are accountable for adhering to the SHERP and for providing their own site health and safety person, who shall report directly to WESTON's SSHO. WESTON's SSHO shall be accountable for site safety during all work activities.

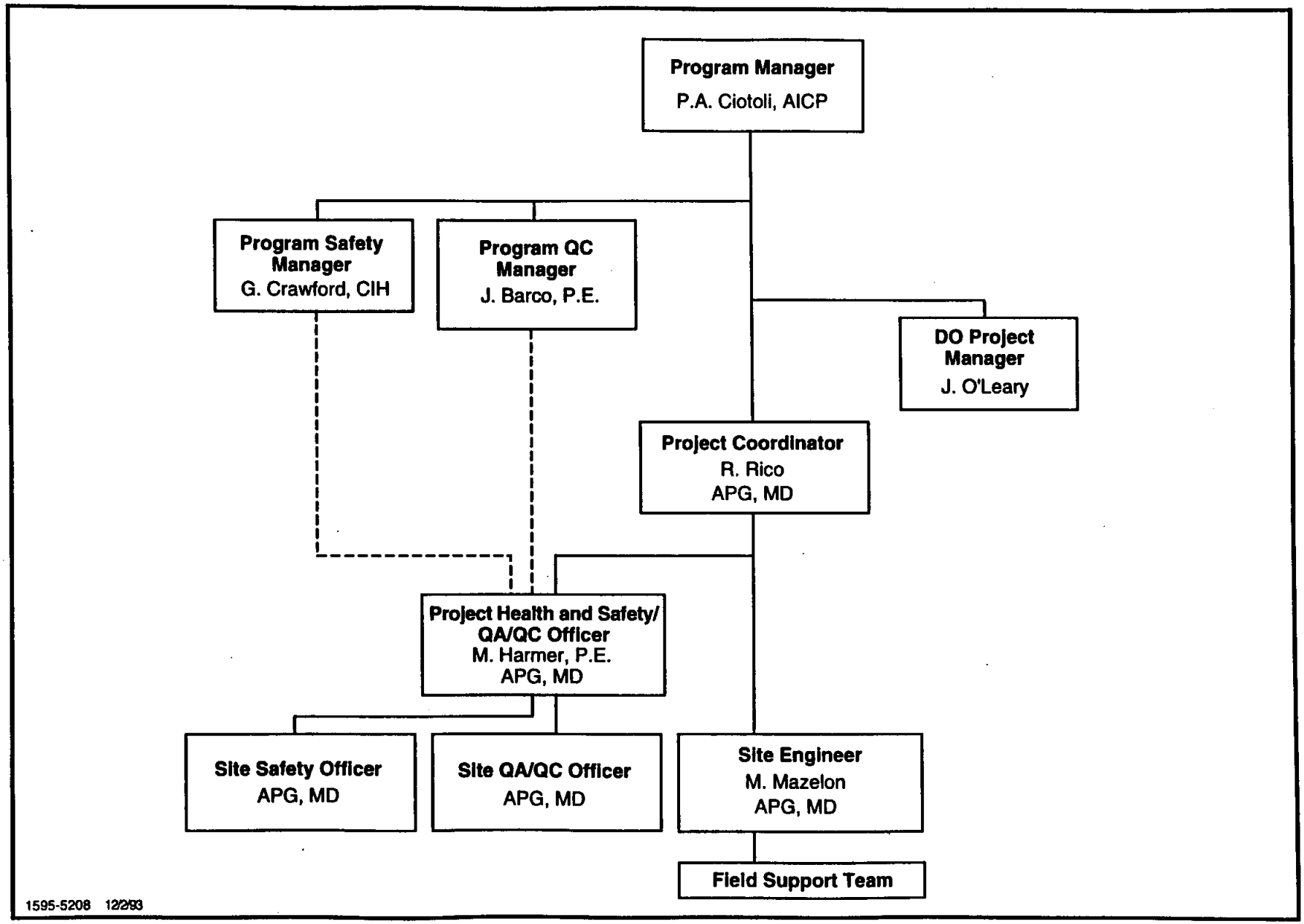


FIGURE 4-3 PROGRAM ORGANIZATION CHART FOR DELIVERY ORDER NO. 10

4.3 HAZARD ASSESSMENT AND RISK ANALYSIS

4.3.1 Site Description/Background

Building E-2370, the former Adamsite Storage Vaults, is located on the eastern side of the peninsula between the Gunpowder River and the Bush River, in an area of Edgewood known as the Bush River Research Operations Area of APG, as shown in Figure 4-1. The activities described in this SSWP involve the removal action of soil near the Adamsite Storage Vaults and the removal and securement of the vaults. Refer to Sections 1 and 2 for a description of the background of the site, previous sampling and analysis results, and for a discussion regarding WESTON's scope of work.

4.3.2 Potential Hazards of Concern

Potential hazards of concern during site activities at the Adamsite Storage Vaults are outlined as follows:

- Physio-Chemical — Combustible gas concentration and percent oxygen in each vault prior to baseline air monitoring. Previous air monitoring of the vaults by WESTON in July and August 1993 with a CGI/O_2 meter inside of the vaults indicated no readings above background levels.

- Chemical — Previous sampling and analysis results at the Adamsite Storage Vaults are discussed in Section 1 of this SSWP. The chemicals of concern for the removal actions proposed in this SSWP are the hazardous chemicals detected at soil borings B-2 and B-3, the soil boring during installation of monitoring well MW-2, and the vault water and sediments. These chemicals include lead, arsenic, mercury, beryllium, and PCBs. Table 4-1 lists these chemicals and their associated properties.

- Physical — Hazards associated with removal of the aboveground building structure, hot work, entry into a confined space, and working in elevated areas.

4.3.3 Recommended Protective Measures

Table 4-2 provides a task-specific hazard analysis and identifies the PPE and air monitoring requirements to be used for each task during site activities. This subsection is to be used as a supplement to Table 4-2 for further explanation of the proposed levels of protection (LOP).

Mobilization activities, which include preplanning and mobilization of equipment and personnel, shall present personnel with a very low potential for exposure to chemical

Table 4-1

Chemicals of Concern
DO No. 10

Chemical Name/Synonyms	Monitoring Method *Level **Action	Effects and Levels	Physical/Warning Properties	Reac. Class Flash Point LEL UEL	Symptoms of Acute Exposure	Incompatibilities
Arsenic (inorganic) 7740-38-2 (As) Also applies to arsenic compounds as As *	Particulate monitor *See Table 4-3. **Stop work, implement dust control measures. (This assumes soils are contaminated in low levels with this chemical.)	PEL-0.01 mg/m^3 TLV-0.2 mg/m^3 0.002 mg/m^3-C 100 mg/m^3-Ca Inhalation, absorption, contact, and ingestion.	Appearance and odor vary. Anhydride odor threshold 1 ppm.	Nonflammable * * *	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, respiratory irritation, and hyperpigmentation of skin. Target organs: liver, kidneys, skin, lungs, and lymphatic system.	When heated or in contact with acid, emits toxic fumes. Can react with oxidizing materials.
Beryllium	Particulate monitor *See Table 4-3. **Stop work, implement dust control measures.	0.002 mg/m^3-PEL 0.002 mg/m^3-TLV 0.0005 mg/m^3-REL Carcinogen inhalation, contact, and ingestion	Grayish, white, hard, light metal.	Flammable * * *	Respiratory symptoms, weakness, fatigue, and weight loss.	Fire hazard when exposed to flame.
Chlorodiphenyl (54% chlorine) (NIOSH, OSHA, ACGIH) 11097-69-1 PCBs Aroclor 1254	Particulate monitor *See Table 4-3. **Stop work, implement dust control measures. (This assumes soils are contaminated in low levels with this chemical.)	0.5 mg/m^3-skin 0.5 mg/m^3-skin 0.001 mg/m^3 5 mg/m^3-Ca Inhalation, absorption, contact, and ingestion.	Colorless to pale-yellow viscous liquid, mild hydrocarbon odor.	Combustible 432°F * *	Irritation of eyes and skin; acneform dermatitis; jaundice; dark urine; and liver damage.	Strong oxidizers. Exposure to fire results in the formation of soot containing dibenzofurans and dibenzo-p-dioxins.

Table 4-1

Chemicals of Concern
DO No. 10
(Continued)

Chemical Name/Synonyms	Monitoring Method *Level **Action	Effects and Levels	Physical/Warning Properties	Reac. Class Flash Point LEL UEL	Symptoms of Acute Exposure	Incompatibilities
Lead, inorganic fumes/dust 7434-92-1 Pb	Particulate monitor *See Table 4-3. **Stop work, implement dust control measures. (This assumes low-level contamination of on-site dust with this chemical.)	0.05 mg/m^3 — PEL 0.15 mg/m^3 — TLV 0.1 mg/m^3 — REL 700 mg/m^3 — IDLH Inhalation, ingestion, and contact.	Dull gray, soft metal. Oxides are gray, red, or orange. No odor.	Not combustible • • •	Lassitude; insomnia; pallor; eye irritation; anorexia; constipation; and abdominal pain. Target organs: gastrointestinal tract, central nervous system, kidneys, blood, and gingival tissue.	Strong oxidizers, acids.
Mercury 7439-97-6	Mercury vapor analyzer *See Table 4-3. **Stop work, implement dust control measures. (This assumes low-level contamination of on-site dust with this chemical.)	0.005 mg/m^3 - TWA 28 mg/m^3 - IDLH Contact, inhalation, and ingestion.	Silver-white, heavy, mobile, liquid metal; slightly volatile at ordinary temperature.	Not combustible • • •	Nausea; vomiting; abdominal pain; bloody diarrhea; inflammation of mouth and gums; excessive salivation; and loosening of teeth	Strong oxidizers.

Table 4-2

Task-Specific Hazard Analysis

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Mobilization				
● Preplanning. ● Mobilize equipment. ● Mobilize personnel.	1. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.	EPA Level D	No air monitoring.
	2. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	3. Inclement weather.	Follow procedures described in Attachment B-1.8.		
	4. Heat stress/cold stress.	Perform heat/cold stress monitoring as described in Attachment B-1.9.		
Site Preparation				
● Conduct baseline air monitoring. ● Delineate work zones. ● Establish site controls.	1. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.	EPA Level D	Baseline air monitoring shall be performed using a PID, FID, CGI/O_2, and NaI scintillation radiation detector.
	2. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	3. Electrical storms.	Follow procedures described in Attachment B-1.8. Ground generator to a depth of 6 inches.		
	4. Inclement weather.	Follow procedures described in Attachment B-1.8.		
	5. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		

Table 4-2

Task-Specific Hazard Analysis (Continued)

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Remove Contents of the Vaults/Pressure Wash and Seal Vaults				
● Remove water. ● Remove sediments. ● Remove debris, if necessary. ● Staging of water, sediment, and/or debris containers, if necessary. ● Pressure washing/ cleaning of vaults. ● Seal vaults with epoxy coating or similar.	1. Hazardous material handling and staging.	All water contained within the vaults shall be handled without spills or releases to the environment. The water shall be transferred from each vault into a tank truck, portable tank, and/or 55-gallon drums for disposal and/or storage. The sediments, if any, shall be transferred into 55-gallon drums and/or portable containers. The debris, if necessary, shall be transferred into wooden 4-ft by 4-ft by 4-ft boxes. All containers shall be segregated by vault number and appropriately staged. The WESTON SOP supplied as Attachment B-1.6 details procedures on handling hazardous materials.	EPA Level C for removal of water, sediments, debris, and/or pressure washing. Upgrade, as necessary. EPA Level D for staging of containers. EPA Modified Level D for decontamination of equipment used during removal activities.	Continuous with a CGI/O_2, PID, FID, and particulate monitor during removal of water, sediments, debris, and pressure washing during any vault entry operations, and during decontamination of equipment. No air monitoring required for staging of containers.
	2. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.		
	3. Inclement weather.	Follow procedures described in Attachment B-1.8.		
	4. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		
	5. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	6. Confined space (only if vaults are entered by personnel).	Follow procedures described in Attachment 4-1.		
	7. Working over water.	Follow procedures described in Attachment 4-2.		

Table 4-2

Task-Specific Hazard Analysis (Continued)

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Remove Contents of the Vaults/Pressure Wash and Seal Vaults (Continued)				
	8. Working in elevated areas.	Follow procedures described in Attachment 4-2.		
	9. Pressure washing.	Follow procedures described in Attachment B-1.13.		
Removal of Roof Panels, Structural Steel, and Aboveground Concrete				
● Removal of roof panels. ● Removal of structural steel. ● Breaking up of aboveground concrete. ● Staging, cutting, and dismantling of roof panels and structural steel.	1. Demolition.	Follow procedures outline in the Site-Specific Demolition Plan contained in Attachment 4-4.	EPA Level D unless entry into the vaults is required. EPA Level C for vault entry only.	CGI/O_2 meter and particulate monitor during breaking up of aboveground concrete. CGI/O_2, PID, FID, and particulate monitor during EPA Level C activities. CGI/O_2 meter during hot work activities.
	2. Material lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.		
	3. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	4. Heat stress/cold stress.	Perform heat/cold stress monitoring as described in Attachment B-1.9.		
	5. Slip/trip/falls.	Maintain site in neat and orderly condition.		
	6. Working in elevated areas.	Follow procedures described in Attachment 4-2.		
	7. Hot work.	Follow procedures described in Attachment 4-3.		

Table 4-2

Task-Specific Hazard Analysis (Continued)

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Removal of Roof Panels, Structural Steel, and Aboveground Concrete (Continued)				
	8. Confined space, only if vaults are entered by personnel and confined space hazards are not eliminated.	Follow procedures described in Attachment 4-1.		
	9. Sharp objects.	Wear leather work gloves.		
Secure Vaults				
● Backfill with nonporous material to an elevation 12 inches below the existing ground surface.	1. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.	EPA Level D.	No air monitoring.
● Finish backfilling with crushed stone and regrade to the elevation of the existing ground surface.	2. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	3. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		
	4. Working in elevated areas.	Follow procedures described in Attachment 4-2.		

Table 4-2

Task-Specific Hazard Analysis (Continued)

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Excavation of Soils/Soil Sampling				
• Remove soil in areas of soil borings B-2 and B-3 and monitoring well MW-2. • Remove visibly stained surface soils. • Sample excavation areas and stockpiled soils.	1. Hazardous material handling and staging.	All excavated soils shall be handled without spills or releases to the environment. The excavated soils shall be transferred to the designated staging area. The WESTON SOP supplied as Attachment B-1.6 details procedures on handling hazardous materials.	EPA Level C. During excavation and sampling of soils at monitoring well MW-2, a mercury vapor cartridge shall be used in lieu of a GCM-H cartridge. If heavy equipment operator uses an enclosed cab, the operator shall wear EPA Level D PPE.	CGI/O_2, PID, FID, and particulate monitor. A mercury vapor analyzer shall be used during the excavation and sampling of monitoring well MW-2 due to mercury that was detected during previous sampling activities.
	2. Manual lifting.	Follow procedures described in Attachment B-1.5, Manual Lifting of Heavy Objects.		
	3. Inclement weather and electrical storms.	Follow procedures described in Attachment B-1.8. Ground Generator, if applicable.		
	4. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		
	5. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	6. Slips/trips/falls.	Maintain site in neat and orderly condition.		
	7. General construction site hazards.	Follow procedures for excavation and general construction in Attachments B-1.4 and B-1.11.		

Table 4-2

Task-Specific Hazard Analysis (Continued)

Task (● = subtask)	Hazard	Control	LOP	Monitoring
Site Restoration				
● Backfill excavation areas. ● Regrading.	1. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.	EPA Level D.	No air monitoring.
	2. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	3. Inclement weather.	Follow procedures described in Attachment B-1.8.		
	4. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		
Demobilization				
	1. Manual lifting and material handling.	Follow procedures described in Attachments B-1.5, Manual Lifting of Heavy Objects, and B-1.6, Material Handling, Storage, and Disposal.	EPA Level D.	No air monitoring.
	2. Hand and power tools.	Follow procedures described in Attachment B-1.3, Hand and Power Tools.		
	3. Inclement weather.	Follow procedures described in Attachment B-1.8.		
	4. Heat stress/cold stress.	Perform heat stress/cold stress monitoring as described in Attachment B-1.9.		

contaminants. Therefore, EPA Level D protection shall be worn during the performance of this task and no air monitoring shall be required.

Site preparation activities include delineation of work zones, baseline air monitoring, and establishing site controls. These activities shall present personnel with a very low potential for exposure to chemical contaminants. Therefore, EPA Level D PPE shall be worn during the performance of this task. Baseline air monitoring shall be conducted using a CGI/O_2 meter, PID, FID, and sodium iodide (NaI) scintillation radiation detector.

WESTON shall minimize entry into the vaults by removing materials and/or pressure washing the vaults remotely, whenever possible. Removal of the vault water, vault sediments, and debris (if necessary) shall be performed in EPA Level C PPE. Continuous air monitoring with a CGI/O_2 meter, PID, FID, and particulate detector shall be conducted during removal of the vault water, vault sediments, and debris, and during entry into the vaults. The use of the PID and FID shall detect the presence of organic vapors. The particulate detector shall be utilized to measure airborne particulates. Decontamination of equipment shall be performed in EPA Modified Level D PPE. Staging of containers and other similar tasks shall be performed in EPA Level D PPE.

Removal of the roof panels, structural steel, breaking up of the aboveground concrete, and staging of these items shall be performed in EPA Level D PPE since the potential for exposure to chemical hazards is low. Continuous air monitoring with the CGI/O_2 meter will be performed during hot work activities associated with this task. WESTON shall follow the Site-Specific Demolition Plan included in Attachment 4-4 while performing this task.

Securing the vaults through backfilling with nonporous material and crushed stone and site restoration and demobilization activities shall be performed in EPA Level D PPE since the potential for exposure to contaminants is low. No air monitoring during these activities shall be required.

The major hazard of concern during soil excavation and soil sampling activities is exposure to airborne particulates. Previous sampling and analytical results, which are included in Attachment 1-3, indicated detectable levels of inorganic parameters (i.e., arsenic and beryllium). Routes of exposure for these inorganics are by contact with or inhalation of dust. Soil excavation and soil sampling activities shall be performed in EPA Level C PPE. However, the heavy equipment operator shall be permitted to perform excavation activities in EPA Level D PPE if an enclosed cab is provided. Dust suppression techniques, such as use of water misting, shall be conducted as needed during soil excavation activities. Air monitoring with a particulate detector, CGI/O_2 meter, PID, and FID shall be conducted during soil excavation and soil sampling activities. A mercury vapor analyzer shall also be required during excavation of the soils at soil boring B-3 since mercury was detected at this location during previous sampling activities.

4.3.4 Physical Hazards

The physical hazards of this work include the hazards associated with field construction work, such as heat stress and cold stress, slips, trips, and falls, heavy equipment operation, and manual lifting of heavy objects. If necessary, WESTON shall install barriers around the vaults to minimize the potential for slipping, tripping, and/or falling. The hazards of pressure washing shall be minimized by adhering to the procedures in Attachment B-1.13 of the Standard Supplement. These and other physical hazards are addressed in Attachment B-1 of the Standard Supplement, WESTON's Standard Operating Procedures (SOPs). The SOP for heat stress and cold stress is contained in Attachment B-1.9.

In addition, nonconstruction-type physical hazards, including flammable or combustible gases, may be present. These hazardous gases shall be detected using a CGI (see Table 4-2).

4.3.5 Plant/Animal/Biological Hazards

The biological hazards most likely to be encountered by site personnel include animal bites, insect stings, or contact with irritant plants. These hazards are applicable to all activities and are not specifically noted in the task-specific hazard analysis (see Table 4-2).

4.3.5.1 Animal and Insect Bites

Animal bites or stings are usually nuisances (localized swelling, itching, and minor pain) that can be handled by basic first-aid treatment. The bites of certain snakes and spiders contain sufficient poison to warrant medical attention. There are diseases that can be transmitted by insect and animal bites [e.g., Rocky Mountain spotted fever, Lyme disease (ticks), rabies (mainly dogs, skunks, and foxes), malaria, and equine encephalitis (mosquitos)]. The greatest hazard and most common cause of fatalities from animal bites, particularly from bees, wasps, and spiders, is from a sensitivity reaction. Shocks caused by stings can lead to severe reactions in the circulatory, respiratory, and central nervous systems, which can also result in death.

None of the personnel expected to be working on this task are known to be allergic to bee (etc.) stings. If anyone is assigned subsequently who is allergic, they shall be required to have their prescribed treatment with them and first aid personnel shall know where it is located. All stings or bites shall be taken seriously. Anyone stung or bitten shall be required to stop work while that person is observed for signs of severe swelling, shortness of breath, nausea, or shock. If there is any doubt, medical attention shall be obtained per Subsection 4.7.3.1.

There has been a high incidence of bites by wild rabid animals in the Aberdeen area over the past several years. All wild animals are to be avoided, especially wild animals that are

overly passive or aggressive. WESTON personnel shall visually survey the work area for wild animals and report such animals, if any, to the appropriate APG facility personnel.

Skunks, raccoons, foxes, and bats are the wild animals most frequently found to be infected with rabies; however, any warm-blooded animal could be infected. If bitten by an animal suspected of being infected with rabies, try to capture the animal without being bitten again or contacting the mouth or any saliva, or keep the animal under surveillance and call the appropriate APG agency for assistance in capturing the animal.

Have the animal tested. A dead animal suspected of being infected should be preserved and also tested. Health departments are often sources of testing or obtaining information about where testing can be done.

As quickly as possible, wash the bite area with soap and water and disinfect it with 70% alcohol. Then go to a doctor or an emergency room for follow-up treatment.

Rabies is preventable, even after being bitten, if treatment is begun soon enough. Thus, getting prompt medical attention and confirming that the animal that bit you is not infected are very important.

Rabies is not curable once symptoms or signs of rabies appear.

4.3.5.2 Contact with Plants

The most dangerous toxic effects from plants are due to the ingestion of nuts, fruits, or leaves. Consequently, personnel are prohibited from eating any fruits, nuts, or other plant material that may grow on the site. Of more concern to response personnel are certain plants, including poison ivy, poison oak, and poison sumac, which produce adverse effects from direct contact. The usual effect is dermatitis—inflammation of the skin. The protective clothing and decontamination procedures used for chemicals also reduce the exposure risk from plant toxins. Cleaning the skin thoroughly with soap and water after contact shall reduce risk.

4.3.6 Action Levels: Upgrade/Downgrade LOP

In general, the actions taken to control exposure to the hazards present at the work site shall be determined by direct observation or measurement of the hazard. For physical hazards, knowledge of the work methods and visual observation of the work site shall be the principal means for recognizing the presence of these hazards. SOPs have been devised to prevent these hazards from injuring workers, and these SOPs are identified by task in Table 4-2. Refer to Table 4-3 for the generally applicable action levels. The protocol for upgrading and downgrading LOP is given in Subsection 4.5.3.

Table 4-3

Generally Applicable Action Levels

Instrument/Contaminant/Exposure Limit	Instrument Response/Action Limits	Action
FID or PID/organic vapors/PEL, TLV, or NIOSH REL	Portable, DRI ≤1 unit above background Portable, DRI - >1 unit above background - >5 units above background - >15 units above background	EPA Level D or EPA Modified Level D Minimum PPE - EPA Level C Remain in minimum EPA Level C Minimum PPE - EPA Level B
Real-time aerosol monitor (Miniram or equivalent meter)/total particulate/PEL, TLV, or NIOSH REL	Indirect - need some idea of soil concentration/ - >0.5 mg/m^3 for Adamsite	Minimum PPE - EPA Level C; institute dust control
CGI (outdoor)/combustible gases or vapors/% of LEL	Direct-reading instrument < 10% > 10% < 20% > 20%	 Continue operations Extreme caution, determine source Stop work until % LEL < 10
NaI gamma scintillator/gamma radiation	≥3 times background, but <1 mr/hr ≥1 mr/hr	Continue investigation with caution. Consult with the WESTON Radiation Specialist, WESTON CHP and/or Program Safety Manager, and the APG Health Physicist. Potential radiation hazard. Stop work. Continue investigation only after consultation with the WESTON Radiation Specialist, WESTON CHP and/or Program Safety Manager, and the APG Health Physicist. Continued investigation may require the use of a personal dosimeter and/or collection of a urine sample.
Mercury vapor analyzer	0.5 of TLV 0.5 of IDLH	Upgrade to EPA Level C using a vapor-certified cartridge. Minimum PPE - EPA Level B.

Chemical hazards are frequently not visually observable. Thus, knowledge of the potential presence of the hazard, coupled with chemical monitoring with direct-reading instruments and laboratory analysis of samples, must be employed to recognize and select protocols to control the hazard. In this subsection, general rules are described for determining the initial type of PPE required by the type of work activity. In addition, chemical monitoring action levels have been established for determining when upgraded personnel protection is required or even when work should cease.

Task-specific information is given in Table 4-2 regarding monitoring methods/frequencies and PPE selections. Basic air monitoring information is provided in Subsection 4.10, Air Sampling/Monitoring Subplan.

4.3.7 Prevention of Off-Site Exposure/Contamination

WESTON shall implement control measures to ensure that the contaminants of concern present at the site do not migrate and cause a potential exposure hazard to any off-site personnel. This shall be accomplished by using and implementing the following contamination and spill control measures:

- Any release of chemicals from any containers shall be contained and prevented from entering the soil or groundwater. Subsection 4.7 of the SSWP details the procedures that WESTON intends to use to control and contain spills.

- An airborne discharge control plan is established in Subsection 8.4.3 of the SSWP. This shall aid in monitoring airborne releases of the contaminants of concern and ensuring that off-site personnel are not exposed to elevated levels of contamination.

- Waste disposal practices shall ensure that all contamination removed from the site shall be enclosed and sealed in approved containers. Subsection 8.4.3 of the SSWP describes waste disposal control measures.

- No burning shall take place at the site that would allow contaminants to become airborne.

- Dust control measures shall be established, when necessary, to mitigate contaminants leaving the site through airborne dust particles. Subsection 8.4.3 of the SSWP outlines the details of the dust control procedures WESTON plans to use.

4.4 SITE CONTROL

4.4.1 Work Zones/Site Map

The three general work zones that may be established on-site are the exclusion zone, the contamination reduction zone, and the support zone. See Figure 4-4 for the tentative layout of the work zones. During Level D operations, specific delineation of work zones shall not be necessary since the removal of PPE does not apply, with the exception of building demolition activities (see Attachment 4-4). However, staging areas and specific site hazards shall be delineated, as directed by the SSHO, in an effort to maintain a safe, neat, and orderly site. If constructed, each of the work zones shall be designated by temporary fencing and/or boundary tape, warning signs, and/or other distinguishable signs. Access prior to reaching the work zones shall be limited by barricade tape and/or warning signs.

4.4.1.1 Exclusion Zone

The exclusion zone is defined as the area where contamination is either known or likely to be present, or because of activity, shall provide the potential to cause harm to personnel. Entry into the exclusion zone requires the use of PPE, as directed by the SSHO and the SHERP.

4.4.1.2 Contamination Reduction Zone

The contamination reduction zone is the area designated for personnel and equipment decontamination. It is essentially a buffer zone between the exclusion and support zones. Activities to be conducted in this zone shall require personnel protection as deemed necessary by the SSHO and the SHERP.

4.4.1.3 Support Zone

The support zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Therefore, PPE is not required. This area shall be clearly marked off and secured against contamination.

4.4.2 On-Site/Off-Site Communications

Successful communication among field teams and contact among personnel in the various zones are essential. The following communications systems, when appropriate, shall be available during cleanup activities at APG-EA:

- Cellular telephones.
- Radios (two-way radios).
- Hand signals.

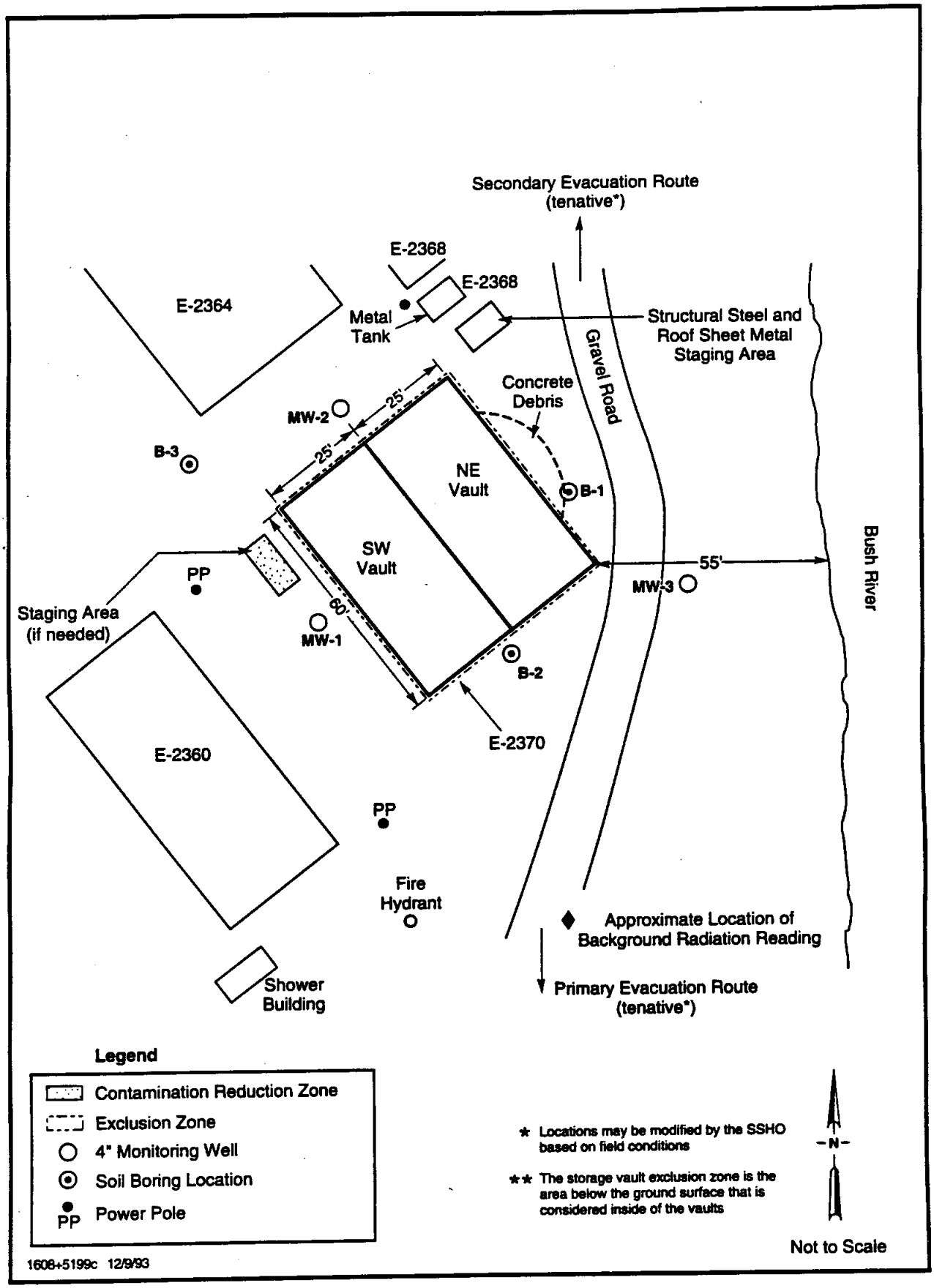


FIGURE 4-4 PROPOSED SITE WORK ZONES

4.4.3 Site Security

Site security is provided in order to restrict unauthorized access to the site. The SSHO and the Site Engineer shall be accountable for maintaining limited access to working areas of the site by using fences or other physical barriers. Nonessential personnel or visitors shall be restricted. The Project Coordinator shall coordinate security with APG security personnel.

4.4.4 Buddy System

During all confined space, EPA Level C, or EPA Level B activities, or when particular conditions present a risk to personnel (both physical and chemical, as determined by the SSHO), the buddy system shall be implemented. The buddy system requires that two people work as a team, each looking out for the other. Buddies must maintain continuous line-of-sight contact with one another and be in a position to physically assist should rescue be necessary. In addition, any EPA Level B activities, as well as specific tasks, shall require the presence of a safety watch.

4.4.5 General Site Rules — Health and Safety Work Precautions

WESTON has established, as part of its Standard Practices Manual, a General Site Safety Guidance document. This document provides a list of operating practices for the following categories:

- General safety precautions.
- Noise protection.
- Heavy equipment operation.
- Hand and power tool safety.
- Manual lifting of heavy objects.
- Material handling, storage, and disposal.
- Inclement weather.
- Heat stress/cold stress.
- Hand signals.
- Hazard communication.
- Pressure washing.

This document has been incorporated as part of this plan as Attachment B-1 of the Standard Supplement. Several of the general site rules shall be posted on-site as a reminder to all site workers.

4.5 PPE

This subsection describes the general requirements of the EPA-designated LOPs (A through D) and the specific PPE selected for this SSWP. The specific LOPs for each required site activity are included in the Task-Specific Hazards Analysis (see Table 4-2).

4.5.1 LOP

Personnel wear protective equipment when response activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated by site activities; or when direct contact with skin-affecting substances may occur. Full facepiece respirators protect the lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific LOP and the necessary components for each have been divided into four categories, according to following the degrees of protection afforded:

- Level A: Used when the highest level of respiratory, skin, and eye protection is needed. (Level A is not expected on this project.)

- Level B: Used when the highest level of respiratory protection is needed, but a lesser level (than Level A) of skin protection is required. Level B is the primary level of choice when encountering unknown environments.

- Level C: Used when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

- Level D: Used only as a work uniform and not on any site with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted and routinely employed during site work activities to maximize efficiency. For example, Modified Level D is used when skin contact hazards exist, but no respiratory hazard is anticipated. Modified Level D would include booties, chemical-resistant gloves, and coveralls, but not a respirator. Likewise, the type of chemical protective ensemble (i.e., material, format, etc.) shall depend on the contaminants, degrees of contact, etc.

The CIH, in conjunction with the SSHO, shall establish action levels for the minimum LOP. The SSHO shall upgrade/downgrade the LOP based on real-time air monitoring results. The action levels shall remain the same, but the LOP may change due to changing site conditions. The protocol for upgrading and downgrading the LOP is given in Subsection 4.5.3.

The LOP selected for site activities is based on the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to the work being done.
- Knowledge of disposed chemicals, along with their properties, such as toxicity and route of exposure.

In situations in which the type of chemical, concentration, and possibilities of contact are not known, the appropriate LOP must be selected based on the professional experience and judgment of the CIH and SSHO until the hazards can be better identified.

4.5.1.1 Level A Protection

It is unlikely that conditions requiring the use of Level A PPE exist at this site. Consequently, Level A PPE is not specified in this subsection. If Level A conditions should arise, all work shall be stopped and the site shall be evacuated until a reassessment of the Work Plan and the SHERP can be completed.

4.5.1.2 Level B Protection

Level B components include:

- Supplied-air respirator (OSHA/NIOSH-approved). WESTON shall use MSA positive-pressure demand (SCBA) units (or equivalent). If the individual requires corrective lenses, a prescription insert shall be used. The individual shall not be permitted to wear contact lenses.
- Chemical-resistant suit (one piece), Chemrel Max, Barricade, or Saranex whole-body coverall for maximum skin protection (MSP).
- Gloves (outer), chemical-resistant (nitrile/silver shield combination or viton/neoprene combination).
- Gloves (inner), chemical-resistant (latex or nitrile).
- Leather safety boots/shoes with chemical-resistant soles, steel toes, and shanks with latex boot covers (outer), chemical-resistant (disposable).

- Chemically protective safety boots (neoprene, polyvinyl chloride (PVC), or equivalent) as an alternative to the leather boots with covers.

- Hard hat.

- Splash shields for use during high splash hazard activities only.

4.5.1.3 Level C Protection

Level C components include:

- Air-purifying respirator, full-face, cartridge-equipped (OSHA/NIOSH-approved). WESTON shall use MSA Ultra-Twin full-face respirators with GCM-H cartridges per recommendation by MSA; for excavation activities at soil boring B-3, a certified mercury vapor cartridge shall be used.

- If the individual requires corrective lenses, a prescription insert shall be used. The individual shall not be permitted to wear contact lenses.

- Saranex (one piece whole-body coverall) or Tyvek (one-piece whole-body coverall).

- Gloves (outer), chemical-resistant (nitrile/silver shield combination or viton/neoprene combination).

- Gloves (inner), chemical-resistant (latex or nitrile).

- Leather safety boots/shoes with chemical-resistant soles, steel toes, and shanks with latex boot covers (outer), chemical-resistant (disposable).

- Chemically protective safety boots (neoprene, PVC, or equivalent) as an alternative to the leather boots with boot covers.

- Hard hat.

- Other PPE such as splash shields and aprons, as determined to be necessary by the SSHO based on anticipated activities.

4.5.1.4 Modified Level D Protection

Modified Level D components include:

- Chemical-resistant clothing (disposable Tyvek or Saranex).

- Gloves (outer), chemical-resistant (nitrile/silver shield combination or viton/neoprene combination).
- Gloves (inner), chemical-resistant (latex or nitrile).
- Leather safety boots/shoes with chemical-resistant soles, steel toes, and shanks with latex boot covers (outer), chemical resistant (disposable).
- Chemically protective safety boots (neoprene, PVC, or equivalent) as an alternative to leather boots with boot covers.
- Safety glasses.
- Hard hat.
- Rain suit, apron, and face shield (during equipment decontamination operations only, as determined to be necessary by the SSHO).
- An M17 series air-purifying respirator slung (as needed).

4.5.1.5 Level D Protection

Level D components include:

- Coveralls (dictated by weather).
- Gloves (cotton or leather; disposable silver shield inner and nitrile outer gloves may be worn under cotton or leather gloves during vault water removal operations while handling hoses/equipment that contact the vault water, as determined to be necessary by the SSHO).
- Safety boots/shoes, with chemical-resistant soles, steel toes, and shanks.
- Safety glasses.
- Hard hat.

4.5.2 Reassessment of Protection Program

The LOP provided by PPE selection shall be upgraded or downgraded based on action levels from direct-reading instruments, a change in site conditions, or findings from investigations.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Change in job tasks during a work phase.
- Change of season/weather.
- Contaminants other than those previously identified are being handled.
- Change in work scope that affects the degrees of contact with contaminants.
- Two separate tasks being conducted simultaneously.

In order to effect downgrades in protection levels, the SSHO must document the reason and notify the WESTON CIH, CEAAO, and DSHE by telephone.

4.5.3 Protocols for Changing LOP

If the SSHO believes the planned LOP or action levels should be downgraded, based on ambient air monitoring results and according to the action levels presented in Table 4-3, the following guidelines must be followed:

1. The LOP shall be downgraded when the action levels in Table 4-3 indicate a permissible reduction of the LOP.

2. If the results of air monitoring exceed the upper action levels, the SSHO shall stop work, evacuate the exclusion zone, and re-evaluate the SHERP in consultation with the WESTON CIH.

If air monitoring results indicate, the LOP shall be upgraded by the SSHO as per the established action limits. This SHERP addresses, in as much detail as possible, LOP components and downgrading criteria. It is recognized that situations may arise that are not specifically addressed in this SHERP. WESTON's Project Health and Safety/QA/QC Officer is experienced and capable of making decisions on the content of LOP and LOP downgrades that are within the intent of the SHERP. CEAAO and the DSHE Installation Safety Division [Bob Crouse, (410) 671-3660] shall be notified of any downgrades in the LOP components that are not identified in this SSWP. Telephone contact shall be considered appropriate notification. If Mr. Crouse is not available, notification shall be made to his office.

4.6 PERSONNEL AND EQUIPMENT DECONTAMINATION

4.6.1 Personal Hygiene/Decontamination

Personal hygiene, coupled with diligent decontamination, shall significantly reduce the potential for off-site exposure to contaminants from the site. The following strict personal hygiene guidelines shall be observed:

- Restrict eating, chewing gum, and smoking to the support zone.
- Wash hands (i.e., hand wipes) before eating or smoking and after leaving the contamination reduction zone.

Every effort shall be made to reduce dust production through engineering controls (i.e., watering, if deemed necessary by the Site Engineer).

Since the PPE to be used is disposable, WESTON shall perform dry decontamination on personnel exiting the exclusion zone. The subsection that follows discusses decontamination procedures for emergency decontamination.

4.6.1.1 Minimization of Decontamination Procedures

During completion of all site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. Given the scope of services to be performed, this may prove very difficult. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

Field procedures shall be developed to control overspray and runoff and to ensure that unprotected personnel working nearby are not affected.

4.6.1.2 Personnel Decontamination Sequence

Figures 4-5, 4-6, and 4-7 present general decontamination sequences planned for the LOP anticipated for APG.

A general step-by-step description of decontamination procedures for contaminated personnel for Levels B, C, and Modified Level D is as follows:

- Segregated Equipment Drop — All monitoring instruments, samples, handtools, and notebooks are dropped in this area to be decontaminated by one of the decontamination team members if visible gross contamination is evident. To aid in decontamination, instruments can be sealed in plastic bags or wrapped in polyethylene. This shall also protect the instruments against contaminants. The instruments shall be wiped clean using paper towels if visible contamination is evident.

Step 1	Segregated equipment drop
Step 2	Outer boot cover and outer glove wash, if needed
Step 3	Outer boot cover and outer glove rinse, if needed
Step 4	Tape removal
Step 5	Outer boot cover removal
Step 6	Outer glove removal

---------- HOT LINE ----------

Step 7	Disposable suit removal/disposal
Step 8	Inner glove removal/disposal

-------- CONTAMINATION REDUCTION ZONE/SAFE ZONE BOUNDARY --------

Step 9	Wash hands (i.e., hand wipes)

FIGURE 4-5 MODIFIED LEVEL D DECONTAMINATION

Step 1	Segregated equipment drop
Step 2	Outer boot cover and outer glove wash, if needed
Step 3	Outer boot cover and outer glove rinse, if needed
Step 4	Tape removal
Step 5	Outer boot cover removal
Step 6	Outer glove removal

- - - - - - - - - - - - - - - - HOT LINE - - - - - - - - - - -

Step 7	Disposable suit removal/disposal
Step 8	Facepiece removal
Step 9	Inner glove removal/disposal

- - - - CONTAMINATION REDUCTION ZONE/SAFE ZONE BOUNDARY - - - -

Step 10	Wash hands (i.e., hand wipes)

FIGURE 4-6 LEVEL C DECONTAMINATION

Step 1	Segregated equipment drop/decontaminate, if necessary
Step 2	Outer boot cover and outer glove wash, if needed
Step 3	Outer boot cover and outer glove rinse, if needed
Step 4	Tape removal
Step 5	Outer boot cover removal
Step 6	Outer glove removal

- - - - - - - - - - - - - - - - HOT ZONE - - - - - - - - - -

Step 7	Remove SCBA backpack; remain on supplied air
Step 8	Disposable suit removal
Step 9	Disconnect from supplied air
Step 10	Facepiece removal
Step 11	Inner glove removal/disposal

- - - - CONTAMINATION REDUCTION ZONE/SAFE ZONE BOUNDARY - - - -

Step 12	Wash hands (i.e., hand wipes)

FIGURE 4-7 LEVEL B DECONTAMINATION

- Outer Boot Cover and Outer Glove Wash and Rinse — Scrub the outer disposable boot covers and outer gloves with a brush, soap, and water. Rinse the boot covers and glove covers. Dry decontamination shall be performed for Level B, Level C, and Modified Level D work if there is no apparent contamination.

- Tape Removal — Remove all sealing tape from around boots, gloves, zippers, etc. Place in the disposable clothing drum or in the designated container.

- Outer Boot Cover and Outer Glove Cover Removal — Remove the outer boots and gloves by pulling down the items and exposing the clean inner lining. Place the boots and gloves in the disposable equipment drum or in the designated container.

- Outer Coverall Removal — Unzip and remove the outer coverall. Place in the disposable clothing drum or in the designated container.

- Facepiece Removal — Remove facepiece and place in a designated area for further cleaning. See the PPE Program (Attachment B-3 of the Standard Supplement) for cleaning procedures.

- Inner Glove Removal — Remove inner gloves and place in the disposable clothing drum or in the designated container. Remove inner coverall, if one is used, and wash hands and face.

If zones are required to be delineated, the decontamination line shall be oriented so that the support zone and contamination reduction zone exit is upwind from the exclusion zone and the first stages of the decontamination line are in the safest location. The line shall be assembled so that it can be easily moved in case of a significant change in wind direction, if applicable. All receptacles for contaminated protective clothing shall be equipped with lids that can be closed to prevent the release of contaminants.

4.6.1.3 Protection Required for Decontamination of Personnel

Personnel assisting with decontamination shall wear the same LOP as those they are decontaminating or one level below, depending on the stage of decontamination with which they are assisting. Additional splash protection (splash shields, splash aprons, etc.) shall be worn by the decontamination personnel assisting in the wet decontamination stages if determined to be necessary by the SSHO. Breathing zone monitoring with a PID and a FID shall be conducted if determined to be necessary by the SSHO after review of the previous air monitoring activities. The action levels defined in Table 4-3 shall be followed for PPE upgrade action levels.

4.6.2 Sampling Equipment Decontamination

Sampling equipment decontamination procedures can be found in Section 5, the FSAP.

4.6.3 Heavy Equipment Decontamination/Decontamination Equipment

Decontamination of heavy equipment shall be accomplished using high-pressure steam and/or wash and rinse with water and brushes if gross visible contamination is evident. The procedure for steam cleaning may be found in Attachment B-1.13 of the Standard Supplement. Steam cleaning shall significantly reduce the amount of rinsate produced and requiring disposal. Residue shall be collected and transferred to a holding container and/or drums. Samples shall be collected of these residues/fluids to determine specific waste characteristics and applicable disposal requirements at the conclusion of all activities.

4.7 EMERGENCY RESPONSE/CONTINGENCY PLAN

This subsection describes contingencies and emergency planning procedures to be implemented at APG sites.

During the site briefings held periodically, all employees shall be trained in and reminded of the provisions of this Emergency Response Plan (ERP), the communication systems, and the evacuation routes. The plan shall be reviewed and revised, if necessary, on a weekly basis by the SSHO and/or the Project Health and Safety/QA/QC Officer to ensure that it is adequate and up-to-date with prevailing site conditions. Periodically, the SSHO shall create at least one mock emergency situation to exercise the procedures for evacuation, personnel injury, fire/explosion, spill/release, or chemical exposure.

WESTON's SSHO is accountable for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area and evacuation of adjacent residents. The SSHO is additionally accountable for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed.

In the event of an emergency that necessitates an evacuation of the site, a portable air horn shall be used to alert site personnel of an evacuation emergency. One long blast shall notify all personnel to exit the site to the meeting areas through the contamination reduction zone, if not obstructed. The one long blast shall indicate site evacuation via an upwind evacuation route as directed by the SSHO. The primary and secondary meeting areas shall be established on a site-specific basis during the morning safety briefing.

A head count shall be completed by the SSHO at the meeting area and further directions or response discussions coordinated at that point.

Following an emergency alarm signal, access to the area of the incident shall be restricted. Physical barriers or banner tape shall be used to delineate restricted areas if conditions permit. Site control shall be the responsibility of the SSHO, who shall establish the new work area boundaries, if necessary. Future entries into restricted areas shall require permission from the SSHO. CEAAO and the DSHE Project Officer shall be notified as soon as possible by telephone whenever an emergency situation arises. In the event of an incident or accident, as described in the subsequent subsections, notification and reporting shall be made according to Subsection 4.12.4.

4.7.1 Chemical Spills/Vapor Releases

In the event of a fire or spill, the SSHO shall notify the appropriate APG organizations (dial military "17" or commercial/mobile 676-0960). All spills are to be reported to CEAAO by dialing 278-4095 and to the DSHE Project Officer (Mr. Don Green, 671-3320 or -4429). Upon notification, DSHE shall notify the appropriate state, local, and federal agencies. Prior to commencement of site activities, the SSHO and/or the Site Foreman shall coordinate with the off-site facilities to define emergency procedures and authority.
REPLACE

In the event of a spill, site personnel shall:

- Alert coworkers.
- Immediately inform their supervisor.
- Assess the situation and determine the safe response procedure.
- Evacuate nonessential people to safe locations.
- Locate the source of the spillage, and stop the flow if it can be done safely.
- Decontaminate reusable equipment, appropriately dispose of expendables, and restock.
- Debrief personnel.
- Take corrective actions to prevent a similar occurrence.
- If the spill presents a threat to human health or the environment, report the spill immediately to APG by dialing military "17" or 676-0960 commercial/ mobile.

Spill response equipment shall be maintained in the support zone. A detailed discussion of the procedures and equipment to contain and remove materials from a spill are presented

in Section 8, the Environmental Protection Plan (EPP). Air monitoring shall be conducted during and after spill cleanup (if conditions permit) to ensure proper protection and to determine the potential release of airborne contaminants.

4.7.2 Fire or Explosion

In the event of a fire, the APG Fire Department shall be immediately summoned following a head count and evacuation. Upon their arrival, the SSHO, or his/her designated alternate, shall advise the Fire Commander of the location, nature, and identification of the hazardous materials on-site (see Subsection 4.7.7, Emergency Contact/Notification System). It should be noted that due to the nature of the possible contaminants, on-site fires can only be put out from an upwind position unless an appropriate LOP and breathing apparatus are worn by the personnel fighting the fire.

Upon approval by the SSHO and/or the Project Health and Safety/QA/QC Officer, and providing that it can be done safely, site personnel may:

- Use fire extinguishers available on-site to control or extinguish a small, localized fire.
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.
- Begin containment and recovery of the spilled materials.

ABC-type dry chemical portable fire extinguishers shall be provided in each work vehicle and at the work location (i.e., in the immediate place where flammable materials are located).

4.7.2.1 Fire Extinguishers

One fire extinguisher shall be located in each work vehicle and one fire extinguisher shall be located in the contamination reduction zone or in the work area if a contamination reduction zone is not required to be delineated.

4.7.3 Injury/Medical Emergency

In the event of a medical emergency, personnel shall take directions from the SSHO, notify the appropriate emergency organization, and adhere to the following procedures:

REPLACE

- Call military "17" (Base telephone) or 676-0960 commercial/mobile (Edgewood).

- Identify location, request medical assistance, and provide name and telephone number.
- Request assistance from the emergency medical service and/or additional assistance.

CEAAO, DSHE Safety, and the WESTON CIH shall be notified as soon as possible by telephone and in writing within 24 hours after any medical emergency has occurred. A formal CEAAO report shall be filed within 24 hours. This report shall comprise USACE Eng. Form 3394 and the required OSHA report forms.

4.7.3.1 Emergency Equipment (First-Aid Supplies and Emergency Eyewash)

The contamination reduction zone shall be equipped with an approved portable eyewash unit in accordance with American National Standards Institute (ANSI) Standard Z358.1 and an ABC-type dry chemical fire extinguisher. At least one "industrial" first-aid kit shall be provided and maintained fully stocked within the support zone.

The first-aid kit location shall be specially marked and provided with supplies necessary to cleanse and decontaminate burns, wounds, or lesions. The location of emergency equipment shall be determined by the SSHO. If necessary (based on field conditions), the SSHO may modify the location of this equipment.

4.7.4 Emergency Decontamination Procedures

The decontamination procedures, as defined in Subsection 4.6, shall be modified to suit the specifics of an incident. For example, if the greatest risk of injury to personnel is physical and not chemical, careful removal of respirators may not be necessary under "hurry-up" conditions. The orderly sequence of clothing removal may be adapted to facilitate the quick exit of personnel from hazardous conditions. In the event of a medical emergency, a decision shall be made concerning the priority of decontaminating the patient relative to the potential for life-threatening injuries. If a patient is contaminated, outer clothing can be cut off and removed, and/or the individual can be wrapped in plastic or a blanket to avoid potential contamination of response vehicles and response personnel.

4.7.5 Emergency Response Assistance

WESTON provides a 24-hour emergency medical consultation service through Environmental Medicine Resources, Inc. (EMR) (1-800-229-3674). This service can provide medical treatment advice to a physician who may be called upon to treat site personnel exposed to chemical hazards.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) to which they have been exposed at the site. Any suspected chemical exposure or life-threatening injuries shall be treated at Kirk Army Health Clinic, EA. All nonserious, non-life-threatening injuries (e.g., minor lacerations, etc.) shall be treated at Fallston General Hospital. The location of Fallston General Hospital with respect to the site is shown in Figure 4-8.

Potential incidents shall be controlled through the application of standard mitigation/control measures available to site personnel. Follow-up reporting shall be made to the CEAAO and other appropriate authorities as well. If an incident on-site becomes uncontrolled, or is in excess of on-site capabilities, the APG emergency response personnel shall be notified of the need for assistance. In such a case, CEAAO and DSHE Safety shall be notified as soon as possible by telephone and in writing within 24 hours after the incident has occurred.

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport to a medical facility. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid should be administered, if possible, while awaiting an ambulance or paramedics. All injuries and illnesses must be reported as soon as possible to CEAAO and the WESTON Project Health and Safety QA/QC Officer.

At least one person certified in first aid techniques, which includes training in CPR, shall be on-site at all times. These individuals may perform other duties, but must be immediately available to render first aid when needed.

If more than one work crew is on-site and they are located more than 5 minutes apart, each team shall have a first-aid kit and at least one member must have current certification in first aid and CPR.

In the event of an accident on-site, the incident shall be handled as follows:

- If an emergency occurs, whether it involves chemical exposure or not, emergency responders shall be notified by dialing "17" from a military telephone or 676-0960 from a commercial/cellular telephone.

- If a nonemergency occurs (lacerations, broken bones, etc.), the victim shall be taken to the Fallston General Hospital, 200 Milton Avenue, Fallston, MD 21047 (410) 877-3700.

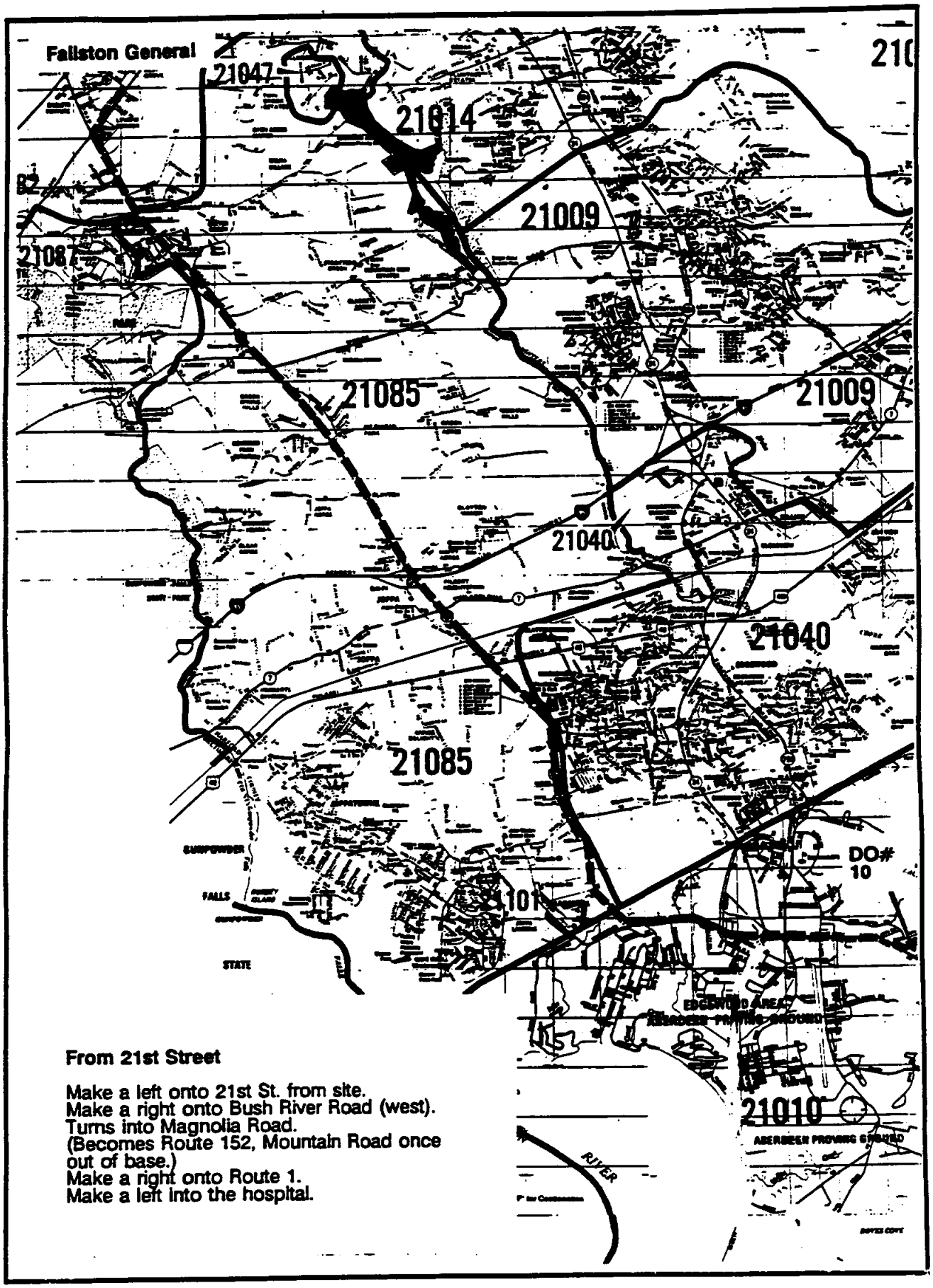


FIGURE 4-8 DIRECTIONS TO THE FALLSTON GENERAL HOSPITAL

Maps highlighting the routes to the medical facilities shall be posted in conspicuous areas on-site during field activities. The SSHO shall determine who to contact in the event of an incident requiring first aid.

4.7.6 Emergency-Use Respirators

If necessary, self-contained breathing apparatuses (SCBAs) shall be maintained on-site for upgrades in the PPE and 5-minute escape packs shall be available for visitors to the site. During Level B operations, a standby person shall be dressed in Level B protective equipment and shall be ready to enter the hot zone immediately upon notification of the need for assistance. Only site personnel trained in their use shall don SCBAs in emergencies. An emergency situation is when a man goes down or the entry team needs immediate emergency assistance and a rescue must be conducted. Three SCBA-trained site personnel shall respond to emergency situations in compliance with the buddy system implemented on-site. A safety watch shall remain posted outside the hot zone.

4.7.7 Emergency Contact/Notification System

All site telephones shall be posted with the list of emergency contact telephone numbers. This list includes local emergency responders and medical facilities, appropriate government officials, and those providing technical information, such as WESTON's medical consultant and the Poison Control Center.

Organization	Base Telephone	Commercial/ Cellular Telephone
Ambulance (Edgewood)	17	410-676-0960
Police (Edgewood)	17	410-676-0960
Fire (Edgewood)	17	410-676-0960
Edgewood - Fallston General Hospital		410-877-3700
Poison Control Center		212-764-7667
Chemtrec		800-424-9555
CEAAO		410-278-4095
APG-DSHE — Installation Safety Division (Bob Crouse)		410-671-3660

APG-DSHE — Environmental Division (Don Green)	410-671-4841
WESTON Health and Safety (George Crawford)	215-430-7406
WESTON Project Health and Safety/QA/QC Officer	410-612-0712
WESTON 24-Hour Health and Safety	215-692-3030
WESTON 24-Hour Medical Emergency (EMR)	800-229-3674
NIOSH: Health Hazard Evaluation	513-684-4382
OSHA: Technical Data Center	202-523-9700
WESTON Equipment Stores - Daytime Number	215-430-7440
WESTON Site Mobile Telephone(s)	To be posted and distributed prior to the start of field activities

4.8 MEDICAL SURVEILLANCE

4.8.1 Medical Surveillance

All personnel entering the delineated exclusion zone or the delineated contamination reduction zone must meet the medical monitoring requirements of 29 CFR 1910.120. OSHA's 29 CFR 1910.120 regulation requires that employers implement a medical monitoring program consistent with paragraph (f) of the standard. An employee profile sheet shall be provided that identifies the medical qualifications of an individual (see Figure 4-9).

The standard states that a medical examination shall be completed for each employee prior to employment, annually thereafter (minimum), and as a follow-up to injuries or overexposures. Employees who must receive medical examinations include those who wear a respirator for 30 or more days a year, and those who are or may be exposed to hazardous substances at or above permissible exposure limits, regardless of respirator use, for 30 days or more per year. The test parameters of the suggested medical examination are as follows:

- Occupational and medical history questionnaire.
- Physical examination by physician, including head, nose, and throat.

EMPLOYEE PROFILE SHEET

I. General Information

Name: _____ SS# _____

Address: _____ Phone (H) _____

_____ (W) _____

Who to contact in case of an emergency: _____

Emergency contact telephone number: _____

II. Medical Profile - Attach supporting documentation

Date of last physical: _____

Date of last fit test: _____

Date of last cholinesterase: _____

Other Concerns (i.e., allergies, medications, etc.):

_____ _____

_____ _____

_____ _____

III. Training Profile - Attach supporting documentation

40-hour Health & Safety: _____

8-hour Refresher (if 40 hour is > 1 year): _____

First Aid (Date): _____ CPR (Date): _____

8-hour Site Safety Coordinator Training: _____

CRDEC Toxic Briefing: _____

Certification Level: _____

Other: _____ _____

_____ _____

I, (Signature and date)_____
have supplied and authorize the use, in an emergency situation by the WESTON/WSI Site Safety and Health Officer for this Project, (Project Name)_____,
of the emergency contact telephone number and information on allergies and medications contained above.

FIGURE 4-9 EMPLOYEE PROFILE SHEET

- Vitals: height, weight, blood pressure, pulse, and respiration.
- Audiometric test and questionnaire.
- Pulmonary function test.
- Resting electrocardiogram.
- Vision test.
- Blood test.
- Urine test.
- PA chest X-ray (one view).
- Other specific tests shall be performed on an individual basis, as specified by the medical oversight professional. These may include, but not be limited to, the following:
  - Methemoglobin baseline.
  - RBC cholinesterase baseline.
  - PCB baseline.

Any personnel injured or suspected of being injured as a result of an uncontrolled release of a hazardous substance or energy, or other emergency situations, shall be given a medical evaluation as soon as possible thereafter. The attending physician shall be provided with a copy of the OSHA hazardous waste site regulation and its appendices (29 CFR 1910.120). The physician shall also be provided with the following information:

- A description of the employee's duties as they relate to the employee's physical and chemical exposures.
- A description of the PPE used.
- A description of the employee's exposure levels.
- Information from previous medical examinations.

4.8.2 Baseline Cholinesterase

All personnel expected to conduct field activities are required to have a baseline cholinesterase test performed at the APG-EA medical facility (Kirk Army Health Clinic — EA). Two blood samples must be collected, the second within 10 days of the first collection.

4.8.3 Licensed Occupational Physician

WESTON contracts with EMR, Inc. of Atlanta, GA, to administer a medical monitoring program as required by 29 CFR 1910.120. The EMR Project Manager for this contract is a board-certified occupational physician as required by OSHA 29 CFR 1910.120. The physician who shall be supporting this project is Dr. D. L. Barnes.

4.8.4 Medical Records Availability

WESTON employee medical records are available upon request from the WESTON Corporate Health and Safety Office, (215) 430-7406, with the employee's permission.

4.9 SAFETY AND HEALTH TRAINING/HAZARD COMMUNICATION

Consistent with OSHA regulations governing hazardous waste operations and emergency response, all personnel required to enter the delineated site exclusion zones and the delineated contamination reduction zones shall have completed and documented training in accordance with the requirements stated in 29 CFR 1910.120. In addition, all personnel shall be trained to recognize the hazards on-site, shall be familiar with the provisions of this SHERP, and shall understand individual responsibilities for site safety. An employee profile sheet (see Figure 4-9) shall be completed for each person entering the contamination reduction zone and/or the exclusion zone. A copy of WESTON's Hazard Communication Program may be found in Attachment B-1.12 of the Standard Supplement.

4.9.1 Comprehensive Health and Safety Indoctrination

All contractor and subcontractor personnel assigned to or regularly entering the delineated exclusion zone or the delineated contamination reduction zone areas of the site (other than the support zone for the purpose of performing or supervising work; for health, safety, security, or administrative purposes; for maintenance; or for any other site-related function) shall have received appropriate health and safety training in accordance with 29 CFR 1910.120. Training shall consist of a minimum of 40 hours of initial instruction off-site. All personnel shall have received a minimum of 8 hours of refresher training each year. In addition, the Project Health and Safety/QA/QC Officer and/or the SSHO shall have a minimum of 8 hours of additional training in managing hazardous waste operations. Documentation of all such training shall be submitted to the Project Health and Safety/QA/QC Officer before any employees shall be allowed past the support zone, and

shall be maintained at the WESTON APG field office by the Project Health and Safety/QA/QC Officer.

The ERDEC Safety Division requires that, in addition to this training, all personnel who work with, or have some association with, CAC and munitions, or have a potential for exposure (e.g., maintenance workers, clerical workers, firefighters, security guards, toxic chemical handlers, surveillance personnel, etc.) at APG are required to attend the ERDEC toxic aid briefing as soon as can be scheduled. Familiarity with the written toxic aid briefing materials, as provided by the APG Surety Officer, shall suffice for training in lieu of attending the actual ERDEC briefing.

4.9.2 Unexploded Ordnance/Explosive Ordnance Disposal (UXO/EOD) Orientation

All WESTON and other subcontractor personnel shall attend an UXO briefing presented by military EOD personnel as soon as can be scheduled. In addition, a supplemental explosives-related materials safety briefing has been developed by Human Factors Applications, Inc. (HFA) and shall be presented to all WESTON personnel and other subcontractor personnel who shall be working on the closure/cleanup sites at APG. This briefing is presented to introduce site personnel to the recognition of explosives-related items, associated hazards, and safety precautions. An outline of the training program is included in Attachment B-1.14 of the Standard Supplement.

4.9.3 Visitor Training

All visitors to the site (persons entering the contamination reduction zone and/or the exclusion zone) shall be required to review the SHERP, relevant attachments, and SOPs, and sign the site compliance agreement to verify having read and understood their contents. The SSHO shall discuss site-specific hazards and concerns and verify that the visitor meets the medical surveillance and training requirements, as required. All WESTON-subcontracted commercial transporters shall be required to possess (according to 49 CFR) a commercial license. The transporters shall be required to submit documentation of a drug-free blood test and documentation of appropriate training.

4.9.4 Preinvestigation Health and Safety Briefing

All personnel assigned to the site shall complete an on-site, specific training session of sufficient duration to ensure that they are capable of and familiar with the use and care of safety, respiratory, and protective equipment and with site control, decontamination, emergency, safety, and security procedures required for the site. The site-specific training session shall be conducted by the SSHO using a training curriculum outline developed by the CIH. The site-specific training program shall address elements of the SHERP and hazards relevant to that specific site and tasks. Only personnel who have successfully completed site-specific training shall be permitted to enter the delineated contamination

reduction zone and/or the exclusion zone to perform work. See Attachment B-1.14 for the site-specific training curriculum.

Daily safety briefings, including a discussion of operational problems and compliance with the Site-Specific SHERP, shall be conducted by the SSHO for all personnel assigned to work at the site. Should an operational change affecting on-site fieldwork be made, a meeting prior to implementation of the change shall be convened to explain health and safety procedures.

All training shall be documented according to the procedures described in Subsection 4.12.6 of this SHERP.

4.10 AIR SAMPLING/MONITORING SUBPLAN

This subsection describes the general concepts of the air monitoring program and specifies the surveillance activities that shall take place during project implementation at APG. Both personal and perimeter low-level air monitoring shall be conducted during field activities.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed. Initial screening for identification is often qualitative (i.e., the contaminant, or the class to which it belongs, is demonstrated to be present), but the determination of its concentration must await subsequent testing.

4.10.1 Environmental and Personnel Monitoring

4.10.1.1 Direct-Reading Monitoring Instruments

Unlike air sampling devices, which are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision-making. Data obtained from the real-time monitors are used to ensure proper selection of PPE, engineering controls, and work practices. Overall, the instruments provide the user with the capability to determine whether site personnel are being exposed to concentrations that exceed exposure limits or action levels for specific hazardous materials.

Of particular significance, especially during initial entries, is the potential for Immediately Dangerous to Life and Health (IDLH) conditions and oxygen-deficient atmospheres. Real-time monitors can be useful in identifying any IDLH conditions, toxic levels of airborne contaminants, flammable atmospheres, or radioactive hazards. Periodic monitoring of conditions is critical, especially if exposures may have increased since initial monitoring or if new site activities have commenced.

Table 4-4 provides an overview of the real-time monitoring instruments that shall be used during field activities. This table may not be all-inclusive. If any equipment that is not intrinsically safe is used, the area shall be monitored with a CGI prior to use.

4.10.1.2 Baseline Monitoring

Baseline (background) monitoring shall be accomplished by conducting a survey of the vault perimeter areas with a CGI, FID, and PID. Presite activity area sweeps shall be conducted with a NaI gamma scintillation radiation meter as well. The results of these monitoring activities shall be thoroughly documented and used to support air monitoring during fieldwork.

4.10.1.3 Monitoring of Active Work Areas

During the period of active work in the exclusion zone, real-time monitoring for industrial contaminants shall be conducted in each active work area, as described in Table 4-2. Real-time measurements shall be made in the breathing zone of the worker with the greatest exposure potential in each active work area. Any concentration above the baseline action levels specified in Table 4-3 shall be reported to the SSHO.

During all site activities conducted inside the vaults, continuous monitoring for oxygen-deficient atmospheres shall be conducted using a CGI/O_2 meter. In addition, monitoring with a FID and PID shall be conducted at least once per shift (as required). Monitoring with a particulate monitor (i.e., Miniram) may also be required during potential dust-producing activities (see Table 4-3). Continuous air monitoring with a mercury vapor analyzer shall be required during the excavation and sampling of soils at the location of soil boring B-3 since mercury was detected at this location during previous sampling activities.

4.10.1.4 Personal Air Sampling

Personal air sampling for common industrial contaminants is not included in this SSWP because of the following:

- None of the activities shall last long enough for the sample analysis results to have a significant effect on the work practices.
- Through the selection of conservative direct-reading instruments, action levels, PPE selection, and engineering controls, it has been determined that the possibility of exposure is extremely remote.

Table 4-4

Direct-Reading Instruments for General Survey

Instrument	Hazard Monitored	Application	Detection Method	General Care and Maintenance	Typical Operating Times
Combustible gas indicator (CGI)	Combustible gases and vapors	Measures the concentration of a combustible gas or vapor	A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured.	Recharge or replace battery	Can be used for as long as the battery lasts
Flame ionization detector (FID) Organic vapor analyzer (OVA) (Manufacturer: Foxboro) or equivalent	Many organic gases and vapors	In survey mode, detects the total concentrations of many organic gases and vapors. In gas chromatography (GC) mode, identifies and measures specific compounds. In survey mode, all organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated.	Gases are ionized in a flame. A current is produced in proportion to the number of carbon atoms present.	Recharge or replace battery Monitor fuel and/or combustion air supply gauges Perform routine maintenance as described in the manual	8 hours; 3 hours with a strip-chart recorder
Gamma radiation survey instrument NaI gamma scintillator	Gamma radiation	Environmental radiation monitor	Scintillation detector.	Must be calibrated annually at a specialized facility and source-checked daily	Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less
Photoionization detector (PID) HNu or equivalent	Organic gases and vapors	Detects the total concentrations of many organic gases and vapors	Gases are ionized by a PID. A current is produced in relation to the photoionization potential of the molecules.	Recharge or replace battery Perform routine maintenance as described in the manual	8 hours

Table 4-4

Direct-Reading Instruments for General Survey (Continued)

Instrument	Hazard Monitored	Application	Detection Method	General Care and Maintenance	Typical Operating Times
Direct-reading colorimetric indicator tube Draeger tubes for benzene	Specific gases and vapors	Measures concentrations of specific gases and vapors	The compound reacts with the indicator chemical in the tube, producing a stain whose length or color change is proportional to the compound's concentration	Do not use a previously opened tube even if the indicator chemical is not stained. Check pump for leaks before and after use. Refrigerate prior to use to maintain shelf life (approximately 2 years). Check expiration date of tubes. Calibrate pump volume at least quarterly. Avoid rough handling, which may cause channeling.	
Oxygen meter	Oxygen (O_2)	Measures the percentage of O_2 in the air	Uses the electrochemical sensor to measure the partial pressure of O_2 in the air and converts that reading to O_2 concentration	Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to expiration interval. If the ambient air is more than 0.55% CO_2, replace detector cell frequently.	8 to 12 hours
Particulate monitor (i.e., Miniram)	Dust/airborne particulates	Measures airborne particulates	Uses direct light scattering aerosol optical detection sensing	Routine maintenance as per manufacturer's recommendation	Continuous during site activities
Mercury vapor analyzer	Mercury vapors	Measures specific concentration of mercury vapor	Sensor measures concentration of mercury	Routine maintenance as per manufacturer's recommendation. Recharge or replace batteries.	Continuous during site activities

4.10.1.5 Sampling, Analytical, and Calibration Protocol

Real-time monitoring instruments shall be calibrated and used in accordance with the manufacturers' instructions. If necessary, they shall be calibrated at the beginning of each workday. Documentation of these procedures is described in Attachment B-4 of the Standard Supplement.

4.10.2 Meteorological Monitoring

The general weather conditions and temperature shall be noted each day in the field logbook.

4.10.3 Heat Stress/Cold Stress Monitoring

See Attachment B-1.9 of the Standard Supplement for heat stress/cold stress monitoring techniques.

4.11 ACCIDENT PREVENTION PLAN AND REPORTING

4.11.1 Administrative Responsibilities for Accident Prevention

Throughout the duration of this DO, WESTON shall ensure that proper administrative and engineering control methods are applied daily to regulate all physical and chemical hazards present at the site. This shall ensure that all health and safety concerns are identified and established, and that this knowledge is presented to all workers. The control measures include the following:

- WESTON shall ensure that all site workers have a minimum of 40 hours of health and safety training in accordance with OSHA 29 CFR 1910.120.
- All workers shall be accountable for full comprehension of the Site-Specific SHERP before entering work zones.
- Before each workday, a daily meeting shall be held between the site SSHO and the field crew to review site activities and associated health and safety concerns for each task.
- Each site shall have a SSHO who shall be able to apply all controls established by the SHERP.

4.11.2 Local Requirements: Noise Control, Traffic Control, and Marking of Hazards

WESTON does not anticipate a significant amount of tanker truck and/or construction-related traffic during activities proposed in this SSWP. However, WESTON shall minimize the effects of traffic by using only the minimum number of site vehicles required to complete the site activities. Site control measures shall be established to minimize noise production and traffic impedance. Site control measures shall be established to clearly mark and identify hazards associated with the site. The site control measures are outlined in the subsections that follow.

4.11.2.1 Noise Control

Noise control measures shall include the following:

- All site activities shall typically take place during normal, daytime working hours. In response to concerns from the U.S. Fish and Wildlife Service, it has been determined that site activities shall be scheduled in a manner that shall not impact the population or habitat of bald eagles nesting in areas close to the Adamsite Storage Vaults. Due to the bald eagle nesting activities, site work shall be performed only during times of the day that do not exceed 30 minutes before sunrise and 30 minutes after sunset.

- Protection against the effects of noise exposure shall be provided for all site personnel, when necessary. Action levels shall be established by referring to the USACE Safety and Health Requirements Manual, Section 32, Noise Control, and regulatory requirements established by OSHA.

- Whenever noise levels exceed specified limits, feasible engineering or administrative controls shall be utilized. According to OSHA regulations, 85 decibels (dB) is the action level for 8-hour exposures. According to the USACE Safety and Health Requirements Manual, the permissible noise exposure for 8 hours is 90 dB.

- When engineering controls are insufficient to regulate exposure to noise, hearing protection shall be supplied to all site workers.

Refer to Attachment B-1.2 of the Standard Supplement, Noise Protection, for a detailed summary pertaining to noise protection.

4.11.2.2 Traffic Control

All work and site traffic shall be regulated by the site control zones established by the SSHO. All site traffic shall be confined to the support zones and specific pathways

designated in the exclusion zone. If several tanker truck arrivals are scheduled, WESTON shall notify the APG-EA military police of the anticipated additional volume of traffic into the Bush River Area. WESTON shall attempt to schedule tanker trucks for staggered arrival/departure, if necessary. This may minimize the effect of this increased volume of traffic.

4.11.2.3 Marking of Hazards

The site work area shall be delineated into three work zones, if necessary. There may be a support zone, a contamination reduction zone, and an exclusion zone. The marking of these zones shall be established prior to site work, if necessary. The exclusion zone shall be delineated so as to contain all site-specific hazards within its boundaries and shall be marked with banner tape, barriers, handrails, and/or temporary fencing. The contamination reduction zone shall be a single corridor between the exclusion zone and the support zone. It shall be clearly marked and identified by site personnel. Workers shall be informed of the physical, chemical, and biological hazards contained within the exclusion zone, and these hazards shall be identified prior to each day's work.

It shall be the responsibility of the SSHO to implement the administrative and physical controls for noise, traffic, and hazard concerns.

4.11.3 Subcontractor Coordination

All subcontractors involved with work on a WESTON site shall follow directions from the WESTON Site Engineer, and the coordination of subcontracted activities shall be managed through continual communication with the subcontractors. The efficient use of subcontractor resources shall depend on advance planning and coordination among the WESTON Site Engineer, the field crew, and the subcontracted party.

4.11.4 Plans for Layout of Temporary Facilities

All WESTON work sites shall be established with the same requirements for layout and construction. An exclusion zone, a contamination reduction zone, and a support zone shall be delineated and established as described previously, if necessary.

The support zone shall have a central command location where all administrative site work shall occur. The size of the facilities located at each site shall be determined by the size of the field team mobilized and the scope of work involved (see Figure 4-4 for the proposed site work zones).

4.11.5 Housekeeping and Maintenance of Safe Access/Egress

Housekeeping and maintenance of access/egress shall be performed in accordance with the USACE Manual, AR 385-61. All work areas shall be free of materials, supplies, and other obstructions. Tools, materials, extension cords, hoses, or debris shall be kept out of the way so as not to cause a tripping or other hazard. Storage and construction areas shall be kept free of accumulation of materials.

4.11.6 Fire Protection and Emergencies

It shall be a requirement of WESTON to maintain a site free of fire hazards and to ensure that all site workers are trained in fire prevention. This includes the following:

- All flammable and combustible liquids shall be stored in proper containers and in a place considered safe for the storage of flammable and combustible liquids, as designated in the EM 385-1-1 Safety and Health Requirements Manual issued by USACE.

- All hot work performed on a WESTON work site shall follow approved WESTON SOPs and shall require a Hot Work Permit. All APG authorities associated with fire hazards shall be notified of all hot work performed on WESTON sites.

- All WESTON sites shall have portable fire extinguishers, which shall be inspected and maintained in accordance with Appendix L of the EM 385-1-1 Safety and Health Requirements Manual issued by USACE and the National Fire Prevention Association (NFPA) Section 10, Portable Fire Extinguishers.

- WESTON shall ensure that the standards of fire prevention outlined in the EM 385-1-1 USACE Safety and Health Requirements Manual, Section 12, Fire Prevention, shall be followed for all work sites.

4.11.7 Inspections, Reporting, Corrective Actions, and Recordkeeping

WESTON shall be able to record, inspect, and audit all site work with the use of administrative techniques. WESTON shall perform and provide health and safety documentation for the following:

- Daily Health and Safety Reports (see Figure 4-10).
- Accident/Incident Reports (see Figure 4-11).
- Medical certifications.
- Training logs.
- Monitoring results.

ROY F. WESTON, INC.
DAILY HEALTH AND SAFETY REPORT
ABERDEEN PROVING GROUND CONTRACT NUMBER DACA87-90-D-0031

DELIVERY ORDER NO. _____ DATE: _____

LOCATION OF WORK: _____

WEATHER: _____ RAINFALL _____ IN. TEMP. MIN. _____ MAX. _____

1. WORK PERFORMED BY WESTON AND SUBCONTRACTORS: _____

2. EQUIPMENT BEING UTILIZED: _____

3. PERSONAL PROTECTIVE EQUIPMENT DONNED: _____

4. AIR MONITORING DATA: _____

SITE SAFETY AND HEALTH OFFICER: _____ DATE: _____

FIGURE 4-10 DAILY HEALTH AND SAFETY REPORT

OSHA No. 101

Case or File No. _____ **INCIDENT REPORT FORM** Date: _____

SUPPLEMENTARY RECORD OF OCCUPATIONAL INJURIES AND ILLNESSES

EMPLOYER (WESTON or Subcontractor)

1. Name _____

2. Mail Address _____

City State ZIP

3. Location, if different from mail address _____

INJURED OR ILL EMPLOYEE

4. Name _____ S.S. No. ____/____/____

(First name) (Middle name) (Last name)

5. Home Address _____

No. and Street City or Town State Zip

6. Age _____ 7. Sex: Male ___ Female ___ Employee No. _____

8. Occupation _____ (Enter regular job title, not job title at time of injury or exposure)

9. Department (Name & No.) _____

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____

(Give address or describe place injury occurred as accurately as possible)

11. Was place of accident or exposure on employee's premises? _____ (Yes or No)

12. What was employee doing when injured? _____

(Specify any tools/equipment/materials involved and what was being done)

13. How did the accident occur? _____

(Describe fully the events which resulted in the injury or illness)

14. List names of witnesses: _____

15. Was the injury due to an automobile accident? _____ (Yes or No) If so, attach automobile accident report.

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

16. Describe the injury or illnesses _____

(Describe in detail and indicate the part of the body affected)

17. Name the object or substance which directly injured the employee _____

18. Date of injury or initial diagnosis of occupational illness _____ Time of injury _____

Date of return to work _____ 19. Date/Time reported to Corporate Health & Safety _____

20. Did the employee die? _____ (Yes or No)

NOTE: Completed Report to be submitted to Corporate Health and Safety within 5 days.

FIGURE 4-11 ACCIDENT/INCIDENT REPORT FORM

RFW 11-01-020/A-07/81

Incident Report Form

Case or File No. _____ Employee Name: _____

PROJECT/PROGRAM IDENTIFICATION

21. Work Order No. _____ or Program ID _____
22. Project Manager _____ Div/Reg OPs Manager _____
23. Div/Reg Operations Safety Officer _____
24. Site/Project Health and Safety Coordinator _____

OTHER

25. List protective equipment and clothing used by employee _____

26. Did limitations of protective equipment/clothing contribute to injury/injury? If so, explain: _____

27. Name and Address of treating physician (also attach medical consultants comments) _____

- Indicate length of stay _____

28. If hospitalized, name and address of hospital _____

- Indicate length of stay _____

CORRECTIVE ACTION

29. Explain corrective actions taken/to be taken which will prevent similar occurrances (attach additional pages if required): _____

DOCUMENTATION OF REVIEW

30. Employee Involved

(Name)	(Signature)	(Date)

31. Safety Management (Site Health and Safety Coordinator, and/or Regional or Divisional Operations Safety Officer)

(Name)	(Signature)	(Date)

32. Review by immediate supervisor and a minimum of one of the following:
    - Project Manager, Project Director, Department/Office Manager, Division/Regional Operations Manager, or Division/Region Manager

(Name)	(Signature)	(Date)

RFW 11-01-020/A-07/01 FIGURE 4-11 ACCIDENT/INCIDENT REPORT FORM (CONTINUED)

Subsection 4.12, Safety Inspections/Logs, Reports, and Recordkeeping, supplies methods and forms for inspections, reporting, corrective actions, and recordkeeping.

4.11.8 Contingency Plans for Severe Weather

In the event of severe weather, all site activities shall cease and shall not restart until it is deemed safe to operate in the field by the SSHO and/or the Project Health and Safety/QA/QC Officer. Severe weather shall be considered any type of climatic anomaly that adds any additional, uncontrollable risk to the health and safety of the workers. See Attachment B-1.8 of the Standard Supplement, Inclement Weather, for further details.

4.12 SAFETY INSPECTIONS/LOGS, REPORTS, AND RECORDKEEPING

4.12.1 Daily Health and Safety Report

A Daily Health and Safety Report (see Figure 4-10) shall be generated by the SSHO only when site work has been conducted. This report documents the location of work, the weather, work performed by WESTON and subcontractors, equipment used, PPE used, and air monitoring data.

4.12.2 Audits

A complete health and safety audit shall be performed by WESTON Corporate Health and Safety on an annual basis. This audit shall address all aspects of health and safety, including:

- Reporting and recordkeeping.
- PPE.
- General construction safety.
- Documentation.
- Monitoring.
- Site control.

4.12.3 Safety Audit Inspection Log

A daily safety inspection shall be performed by the SSHO. The results of this inspection or audit shall be discussed in the daily health and safety briefing to allow corrective actions to be taken in a timely manner. This inspection includes a maintenance check on all safety equipment.

4.12.4 Accident/Incident Reports

All accidents/incidents, including near-misses, shall be immediately reported to the SSHO. The SSHO shall immediately ensure that the necessary first aid and corrective actions have begun and, if necessary, emergency agencies have been called. The SSHO and/or Project Health and Safety/QA/QC Officer shall then notify WESTON Corporate Health and Safety, the CEAAO, and DSHE Safety, and shall document the incident.

Any site personnel, including visitors and subcontractors, who have an accident must fill out a WESTON Incident Report (see Figure 4-11) to be filed with the Corporate Health and Safety Office within 4 working days from the occurrence. The SSHO should report the incident by telephone as early as possible (215-430-7406).

The CEAAO shall be notified as soon as possible of any accidents or incidents. The SSHO shall complete all required USACE reports (ENG Form 3394, see Figure 4-12) for all deaths, lost time accidents, or property damage. Employees who have lost time due to an accident must have a completed Return to Work Form before they shall be allowed to return to work at the site (see Figure 4-13).

In the event that an accident or some other incident, such as an explosion, theft of any hazardous waste/material, or a release of toxic chemicals, occurs during the course of the project, the CEAAO and DSHE Safety shall be notified as soon as possible and shall receive written notification within 24 hours. The report shall include the following information:

1. Name, organization, telephone number, and location.
2. Name and title of person reporting incident/accident.
3. Date and time of incident/accident.
4. Location of incident/accident.
5. Brief summary of incident/accident giving pertinent details, including type of operation ongoing at time of incident.
6. Cause of incident/accident (if known).
7. Casualties.
8. Details of any existing chemical hazard or contamination.
9. Estimated property damage, if applicable.

nly)	REPORT NO.	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT (For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)	REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

VERNMENT	(1) INJURY/ILLNESS/FATAL	(2) PROPERTY DAMAGE	(3) MOTOR VEHICLE INVOLVED	(4) DIVING
ILIAN ☐ MILITARY →	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
NTRACTOR →	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
BLIC →	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

IE (Last,First,MI)	b. AGE	c. SEX ☐ MALE ☐ FEMALE	
SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT (1) ☐ ON DUTY (2) ☐ TDY (3) ☐ OFF DUTY		

3. GENERAL INFORMATION

E OF ACCIDENT (hh/day/year) /	b. TIME OF ACCIDENT (Military time)) / /	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR:
TRACT NUMBER		f. TYPE OF CONTRACT ☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER (Specify)	g. HAZARDOUS/TOXIC WASTE ACTIVITY ☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER (Specify)
VIL WORKS ☐ MILITARY ☐ OTHER			

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see instructions)*

ISTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)

5. INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see instructions)*

VERITY OF INJURY	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY
1 FATAL (2) ☐ LOST- TIME (3) ☐ NON LOST -TIME (4) ☐ FIRST AID			

Y PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY	(CODE)
RY		TYPE	
DARY			
URE OF INJURY		SOURCE	

6. PUBLIC FATALITY *(Fill in line and corresponding code number in box - see instructions)*

VITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED? ☐ YES ☐ NO ☐ NA

7. MOTOR VEHICLE ACCIDENT

OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
PICKUP/VAN ☐ AUTOMOBILE	☐ HEAD ON ☐ REAR END ☐ BACKING	(1) FRONT SEAT			
TRUCK ☐ OTHER (Specify)	☐ BROADSIDE ☐ SIDE SWIPE ☐ ROLL OVER ☐ OTHER	(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

E OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and corresponding code number in box from list - see instructions)*

OF VESSEL/FLOATING PLANT	(CODE)	b. TYPE OF COLLISON/MISHAP	(CODE)

10. ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

FIGURE 4-12 USACE ACCIDENT INVESTIGATION REPORT

FORM 3394 Jun 86

11. CAUSAL FACTOR(S) *(Read Instruction Before Completing)*

a. *(Explain YES answers in item 13)*	YES	NO
DESIGN: Was design of facility,workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc.,contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust,fumes,mists,vapors or physical agents, such as, noise,radiation,etc.,contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture,carrying,stooping,etc.,contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion,was drugs or alcohol a factor to the accident?	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. TRAINING

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAININ
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB ☐ NONE	/ / (Month) (Day) (Year)

13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

b. INDIRECT CAUSE(S)

14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).

DESCRIBE FULLY:

15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

a. BEGINNING *(Month/Day/Year)* / / b. ANTICIPATED COMPLETION *(Month/Day/Year)* / /

c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYME
CORPS _____	___ / ___ / ___		
CONTRACTOR _____	___ / ___ / ___		

16. MANAGEMENT REVIEW *(1st).*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. MANAGEMENT REVIEW *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS:

SIGNATURE	TITLE	DATE

19. COMMAND APPROVAL

COMMENTS

FIGURE 4-12 USACE ACCIDENT INVESTIGATION REPORT (CONTINUED)

COMMANDER SIGNATURE	DATE

· WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE. 215-692-3030
FAX: 215-430-3124

Please fax this form to Roy F. Weston, Inc. - Health & Safety (215)430-3167
ATTN: Anthony Taylor

RETURN TO WORK

IRF CASE NO. _____ EMPLOYEE NO. _____ SS# _____/_____/_____

EMPLOYEE NAME _____ DATE OF INJURY/ILLNESS: _____

PHYSICIAN'S NAME/ADDRESS _____

_____

TELEPHONE NO. ( ) _____

PHYSICIAN'S STATEMENT (Physician, please type or print clearly and fill out or attach equivalent form)

Type of Injury: _____

Diagnosis: _____

_____

Occupationally Related? _____

Treatment: _____

_____

==========

Is further treatment required? _____

Type of Care: _____

_____

Next Appointment: _____

==========

Can employee return to work immediately? _____

If No, when may employee return to work? _____

If Yes, are there any restrictions? _____

_____

How many days? _____

PHYSICIAN'S SIGNATURE: _____ DATE: _____

AUTHORIZATION TO RELEASE INFORMATION

I hereby authorize my attending physician and/or hospitals to release any information or copies thereof acquired in the course of my examination or treatment for the injury identified above to my employer or his representative.

EMPLOYEE'S SIGNATURE: _____ DATE: _____

RFW 11-01-020/B-07/91

FIGURE 4-13 RETURN TO WORK FORM

10. Nature of damage; effect on contract schedule, if any.

11. Action taken by contractor to ensure safety and security.

12. Other damages or injuries sustained (public or private).

4.12.5 Medical Certifications

All field personnel entering the contamination reduction zone and/or the exclusion zone are required to receive medical monitoring on an annual basis as required by OSHA 29 CFR 1910.120. This is documented by medical certifications as signed by a physician.

4.12.6 Training Logs

The Daily Safety Orientation Log (see Figure 4-14) documents the daily site-specific safety training conducted by the SSHO. Detailed are those personnel attending the training, the LOP, topics of discussion, and questions of concern. In addition, accurate and complete logs of all hazardous waste management training, per 29 CFR 1910.120, for all site personnel shall be maintained at the WESTON APG field office, and shall be available for inspection by all interested parties.

4.12.7 Monitoring Results

All field monitoring, including real-time monitoring, heat stress/cold stress, etc., shall be documented in the SSHO's daily health and safety log. This log includes all pertinent information regarding the conditions and specific locations in which the monitoring has taken place.

4.13 SAFETY PERMITS

4.13.1 Confined Space Entry Permit

The Confined Space Entry Permit is shown in Figure 4-15. This permit shall be completed prior to any confined space entry into the vaults.

4.13.2 Hot Work Permits

Hot Work Permits are required when any cutting, grinding, welding, or comparable type of heat-producing work is performed. The permit establishes guidelines and review standards to provide a safe, systematic approach to performing hot work (see Figure 4-16 and the SOP in Attachment 4-3).

Daily Safety Orientation

Site: _____ W.O. #: _____

Conducted By: _____ Date: _____

Personnel Attending: _____

Level of Protection (A, B, C, D): _____

Topics of Discussion: _____

Questions or Concerns: _____

FIGURE 4-14 DAILY SAFETY ORIENTATION LOG

CONFINED SPACE ENTRY PERMIT FORM

PROCEDURE: A confined space entry permit form shall be prepared and updated as needed for all entries to any confined space. It is the responsibility of the Site Safety and Health Officer to prepare and keep the permit current. Permits must be renewed as conditions require but no less frequently than the beginning of each day or shift.

DEFINITION: A confined space is any area that is so enclosed that natural ventilation shall not maintain an adequate oxygen concentration (20%) or remove toxic or combustible gases or vapors sufficiently to remove the risk of illness or explosion.

EXAMPLES: Examples of confined spaces are sewer system manholes, syphon chambers, pump station wet wells and underground levels, sewer lines, chlorine pits, treatment tanks, utility tunnels, vaults and storage rooms, or other closed areas of chemical manufacturing or storage facilities.

ENTRY PERMIT

1. Qualified safety watch stationed outside? _____ Name _____

2. SCBA _____ or combination airline/SCBA worn by safety watch? _____

3. Respirator checked out? _____

4. Chemical and physical protective clothing required? _____
   Hard hat _____, eye and face protection _____, rain gear _____, Saran Tyvek _____,
   acid suit _____, inner gloves _____, outer gloves _____, inner boots _____, outer boots _____,
   other _____.

5. Equipment indicated above available for safety watch _____, entering workers _____.

6. PP/PD SCBA or combination and/or forced ventilation for entering workers _____.

7. Ventilation (forced or natural) plus knowledge of contents and air monitoring with all entries without air-supplying respirators _____.

8. Safety line? _____ and safety harness appropriate? _____ and used? _____

9. Ladders, built in? _____ portable? _____ checked-out as safe for use? _____

10. Communication, radios? _____, intrinsically safe signals? _____; checked out? _____.

11. Lighting explosion proof? _____

12. Explosionproof tools used? _____

13. Confined space requires continuous monitoring from outside? _____, by entry team? _____

14. Safety watch has lock-out keys? _____

15. Feed lines blanked out? _____; electric lines/controls de-energized? _____,
    locked out? _____, tagged? _____; mechanical equipment locked out? _____, tagged? _____

FIGURE 4-15 CONFINED SPACE ENTRY PERMIT FORM

Contaminants to be monitored for:	O_2___	Combust___	CO___	H_2S___	Org. Vap.___
Initial levels without vent	____	_____	____	____	_____
Initial levels with vent	____	_____	____	____	_____
Levels safe for entry	____	_____	____	____	_____

THIS CONFINED SPACE _____
(Identify confined space specifically)

HAS BEEN PERMITTED WITH THE STIPULATIONS STATED ON THE REVERSE BY:

_____ Date ____/____/____ Time _____
(SSHO signature)

Permit must be renewed _____

FURTHER CONDITIONS FOR TANK ENTRY

A. All sources of ignition (matches, open flames, smoking, gas engines, welding, exposed electrical wiring and equipment) removed from the vicinity of the tank? _____

B. Gases or vapors from tank cannot reach ignition sources or populated areas? _____

C. All product, steam, foam, or similar lines are disconnected and blanked off? _____

D. All agitators and other mechanical devices locked out? _____

E. API ____ or NFPA ____ procedures shall be used for all cutting on tanks and any other closed systems, including transport lines.

F. Steam ____ water wash lines bound to tank? _____

G. Cutting on feed lines or other closed system that have not been steamed or otherwise shown to be clean shall be in Level B protection _____ A Hot Work Permit shall be needed? _____

ENTRY TEAM AND SAFETY WATCH SIGN-OFF

I/We have read this confined space entry permit and understand the requirements.

_____ _____
(Name) (Name)

_____ _____
(Name) (Name)

_____ _____
(Name) (Name)

THIS CONFINED SPACE ENTRY PERMIT MUST BE POSTED AT THE SITE LISTED ABOVE. WHEN A NEW PERMIT IS ISSUED, THIS PERMIT MUST BE RETAINED IN THE SITE FILES

FIGURE 4-15 (CONTINUED)

Procedure - A hot work permitting program shall be required on all hazardous sites where sources of ignition may be introduced. The Site Safety and Health Officer (SSHO) is accountable for all site hot work permitting programs.

Definition - Hot work is any process, which, because of its design or function, can cause ignition of a gaseous or vaporous atmosphere due to direct or indirect contact.

Examples - Examples of hot work processes are welding, cutting, grinding, working with power tools, space heaters, unapproved electrical equipment, etc.

HOT WORK PERMIT

1. The SSHO and Site Manager have surveyed the site and found the following hot work conditions do or may exist and shall require permitting:

   Welding _____, Cutting _____, Grinding _____, Use of power tools _____, Space heaters _____
   Electrical equipment, Fixed _____, Portable _____, Hand-held _____, Others _____

2. No hot work situations could exist. _____
   Signature - SSHO

   _____
   Signature - Site Manager

3. Work area inspected by SSHO prior to hot work beginning? _____

4. Fire watch established? _____

5. Fire extinguisher appropriate for media at the hot work site? _____

6. All combustibles are isolated from the hot work? _____

7. All subcontractor, authorized client employees and visitors are aware of the need for hot work permits?

8. Area in which hot work is to be performed has been monitored for combustible atmospheres? _____
   Combustible gas indicator(s) shall be used constantly during hot work? _____

9. Welding or cutting on closed systems prohibited? _____ Closed system cutting procedure required? _____

CERTIFICATION OF SSHO THAT HOT WORK MAY COMMENCE _____

Date _____/_____/_____ Time _____ Expiration time _____ (There should be no more than 15 minutes elapse between time of issuance and beginning of work.)

A NEW HOT WORK PERMIT Shall BE REQUIRED FOR THIS LOCATION _____
at the beginning of each shift or after more than a one (1) hour interval of no hot work procedure.

HOT WORK TEAM SIGN-OFF

I/we have read and understand the terms of this Hot Work Permit:

_____

_____

_____

FIGURE 4-16 HOT WORK PERMIT PROGRAM

4.14 BIBLIOGRAPHY

Code of Federal Regulations; Title 29, 1910.120.

Nemeth, G. U.S. Army Environmental Hygiene Agency. RCRA Facility Assessment Report, Edgewood Area of Aberdeen Proving Ground, MD, No. 39-26-0490-90. November 1989.

Sampling and Safety Plan for the Adamsite Storage Vaults at Edgewood Area, Roy F. Weston, Inc. (WESTON), 16 April 1993.

Preliminary Investigation Report, Sampling of the Adamsite Storage Vaults at Edgewood Area, WESTON, 22 October 1993.

ATTACHMENT 4-1

FIELD OPERATING PROCEDURE FOR CONFINED SPACE ENTRY

ATTACHMENT 4-1

FIELD OPERATING PROCEDURE FOR CONFINED SPACE ENTRY

OVERVIEW

No task(s) involving confined space entry may begin until an appropriate Confined Space Entry Permit is issued.

The SSHO is accountable for recognizing confined spaces and issuing these permits.

A confined space is any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants, or has an oxygen-deficient atmosphere. Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open-top spaces more than 4 ft in depth such as pits, tubs, vaults, and vessels.

Specific confined space entry procedures follow.

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, limited visibility, and restricted movement. This attachment shall establish the requirements for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910, NIOSH 80-106, and USACE Safety and Health Requirements Manual, Section 26, October 1992.

DEFINITIONS

- Confined Space: A space or work area not designed or intended for normal human occupancy, having limited means of egress and poor natural ventilation; and/or any structure, including buildings or rooms, that have limited means of egress.

- Confined Space Entry Permit (CSEP): A document to be initiated by the supervisor of personnel who are to enter into and/or work within a confined space. The CSEP shall be completed by the personnel involved in the entry and approved by the SSHO before personnel shall be permitted to enter the confined space. The CSEP shall be valid only for the performance of the work identified and for the location and time specified.

- Confined Space Observer: An individual assigned to monitor the activities of personnel working within a confined space. The confined space observer

monitors and provides external assistance to those inside the confined space. The confined space observer summons rescue personnel in the event of an emergency and assists the rescue team.

GENERAL PROVISIONS

- When possible, confined spaces should be identified with a posted sign that reads: "Caution — Confined Space."

- Only personnel trained in and knowledgeable of the requirements of these confined space entry procedures shall be authorized to enter a confined space or be a confined space observer.

- A CSEP must be issued prior to the performance of any work within a confined space. The CSEP shall become a part of the permanent and official record of the site.

- Natural ventilation shall be provided for the confined space prior to initial entry and for the duration of the CSEP. Positive/forced mechanical ventilation may be required; however, care should be taken not to spread contamination outside the enclosed area.

- If flammable liquids, gases, or vapors may be contained within the confined space, explosionproof equipment shall be used. All equipment in this type of environment shall be positively grounded.

- The contents of any confined space shall, where necessary, be removed prior to entry. All sources of ignition must be removed prior to entry.

- Feed lines to confined spaces shall be broken and blanked out, and sources of electrical or mechanical energy that could activate any area of the confined space must be identified and tagged and locked out prior to anyone entering a confined space. The lock-out/tag-out procedure must be documented in the CSEP.

- Hand-held lights and other illumination utilized in confined spaces shall be equipped with guards to prevent contact with the bulb and must be explosionproof, if warranted, based on the results of air monitoring activities.

- Compressed gas cylinders, except cylinders used for SCBA, shall not be taken into confined spaces. Gas hoses shall be removed from the space, and the supply turned off at the cylinder valve when personnel exit the confined space.

- If a confined space requires respiratory equipment or where rescue may be difficult, safety belts, body harnesses, and lifelines shall be used. The outside observer shall be provided with the same equipment as those working within the confined space.

- A ladder is required in all confined spaces deeper than the employee's shoulders. The ladder shall be secured and not removed until all employees have exited the space.

- Only SCBA or NIOSH-approved airline respirators equipped with a 5-minute emergency air supply (egress bottle) shall be used in untested confined spaces or in any confined space with conditions determined to be IDLH.

- Where air-moving equipment is used to provide ventilation, chemicals shall be removed from the vicinity to prevent introduction into the confined space.

- Vehicles shall not be left running near confined space work or near air-moving equipment being used for confined space ventilation.

- Smoking in confined spaces is prohibited.

- Any deviation from these confined space entry procedures requires the prior permission of the Corporate Health and Safety Director.

PROCEDURE FOR CONFINED SPACE ENTRY

- Evaluate the job to be done and identify the potential hazards before a job in a confined space is scheduled.

- Ensure that all process piping, mechanical and electrical equipment, etc., have been disconnected, purged, blanked off, or locked and tagged as necessary.

- If possible, ensure the removal of any materials that may produce toxic or air-displacing gases, vapors, or dust.

- Initiate a CSEP.

- Ensure that any hot work (welding, burning, open flames, or spark-producing operation) that is to be performed in the confined space has been approved by the SSHO and is indicated on the CSEP.

- Ensure that the space is ventilated before starting work in the confined space and for the duration of the time that the work is to be performed in the space.

- Ensure that the personnel who enter the confined space and the confined space observer are familiar with the contents and requirements of this instruction.

- Ensure remote atmospheric testing of the confined space prior to employee entry and before validation/revalidation of a CSEP to ensure the following:

  - Oxygen content is between 19.5% and 23.0%.

  - There is no concentration of combustible gas in the space. Air monitoring shall be performed throughout the confined space and specifically performed at the lowest point in the space.

  - The absence of other atmospheric contaminants, if the space has contained toxics, corrosives, or irritants.

If these conditions cannot be met or maintained, the appropriate LOP, as specified in the Site-Specific HASP, must be used. If remote testing is not possible, Level B PPE is required. Continuous monitoring for oxygen content and combustible gases shall be carried into the confined space with the entry team.

- Designate whether hot or cold work shall be allowed. If all tests are satisfactory, complete the CSEP listing any safety precautions, protective equipment, or other requirements.

- The CSEP must be posted at the work site, and a copy placed in the project health and safety file after use.

The CSEP shall be considered void if work in the confined space does not start within 30 minutes after air monitoring is performed or if significant changes in the confined space atmosphere or job scope occur.

The posted CSEP shall be removed at the completion of the job.

CONFINED SPACE OBSERVER

- While personnel are inside the confined space, a confined space observer shall monitor the activities and provide external assistance to those in the space. The observer shall have no other duties that may take his attention away from the work or require him to leave his post at the confined space at any time while personnel are in the space.

- The confined space observer shall maintain some form of contact with all personnel in the confined space. Visual contact is preferred, if possible.

- The observer shall be instructed by his supervisor in the method for contacting rescue personnel in the event of an emergency.

- If irregularities within the space are detected by the observer, the personnel within the space shall be ordered to exit.

- In the event of an emergency, the observer must NEVER enter the confined space prior to contacting and receiving assistance from a helper. Prior to this time, he/she should attempt to remove the person(s) with the lifeline and perform all other rescue functions from outside the space.

- A helper shall be designated to provide assistance to the confined space observer in case the observer must enter the confined space to retrieve a worker.

ATTACHMENT 4-2

WORKING IN ELEVATED AREAS AND NEAR OR OVER WATER

ATTACHMENT 4-2

WORKING IN ELEVATED AREAS AND NEAR OR OVER WATER

Working at elevation (more than 4 ft above grade), cliff hanging, above water, or engaging in activities where falls could result in injury, immersion in water, or contact with chemicals requires provisions for preventing falls. Ideally, this prevention shall be provided by engineering controls, safety railings, toe boards, etc. Ladder use and circumstances in construction at hazardous materials sites or EAs may require fall protection PPE in addition to or instead of engineering controls.

PPE fall protection devices, lifeline systems, consist of safety or body belts, safety harnesses, lanyards, and safety lines. A grabbing device may be used to connect the lanyard to the safety line and act as a brake.

Prior to use of fall protection equipment, personnel must be trained in the use, maintenance, and inspection of the PPE. General safety training is to be supplemented with site-specific training. It is anticipated that the silo water shall be removed from each silo before the silo doors are removed. Therefore, the requirements of this attachment pertaining to working over or near water would not be applicable.

A lifeline system must meet the standards and criteria of OSHA 1926.104 and ANSI A10.14, specifically:

- The anchorage point must be able to support a dead weight of 5,400 pounds.
- Lifelines must be of 3/4-inch manila or equivalent, and have a minimum breaking strength of 5,400 pounds. Lifelines used for rock work or that may be subjected to abrasion must be 7/8-inch wire-core manila rope.
- Safety belt lanyards must be a minimum of 1/2-inch nylon rope or equivalent, no longer than 6 ft, and have a minimum breaking strength of 5,400 pounds.
- Bolts, shackles, D-rings, snap hooks, and metal links must be able to bear a tensile load of 4,000 pounds without cracking, breaking, or permanent distortion.
- All lifeline system hardware shall be drop forged or pressed steel, cadmium-plated in accordance with type 1 Class B plating specified in Federal Specification QQ-P-416. Surfaces must be smooth and free of defects.

- A person experienced in lifeline system use must inspect the entire system before and after each use and at regular (monthly) intervals between uses.

- Lifeline system elements showing any sign of stress or damage, or that have been used to break a free fall, shall be immediately taken out of service and destroyed.

The choice of a lifeline system for this DO shall be based on the actual field needs of each activity and shall be approved by WESTON's Program Safety Manager or his approved delegate.

ATTACHMENT 4-3

HOT WORK PROCEDURES

ATTACHMENT 4-3

HOT WORK PROCEDURES

OVERVIEW

No task(s) that produces heat, sparks, or energy sufficient to serve as an ignition source may begin in any location that could potentially have ignitable atmospheres, until a hot work protection procedure has been instituted and a Hot Work Permit has been issued.

Examples of hot work include welding, cutting, burning, soldering, grinding, use of power tools, and use of internal combustion engines.

Many operating facilities or clients shall have internal hot work permitting practices. WESTON shall use whichever is more conservative.

The Corporate Health and Safety Department must approve the use of a client's hot work permitting system.

The SSHO is accountable for issuing Hot Work Permits.

Expired Hot Work Permits must be retained as part of the site or project health and safety file.

Permits must be reissued at the beginning of the work task, or if the area has not been monitored within 30 minutes.

HOT WORK PERMIT PROCEDURES

- The SSHO is accountable for inspecting each site and determining the need for a Hot Work Permit procedure.
- All WESTON employees, WESTON subcontractor employees, and any employees for whom WESTON has safety oversight must be formerly notified and instructed of the requirement for, need for, and procedures for obtaining Hot Work Permits.
- A fire watch is required for every activity where hot work could result in other than a minor fire due to ignition of combustibles.
- Fire-extinguishing equipment commensurate with the ignitable matrix and training level of the fire watch must be immediately available at the hot work location.

- A combustible gas meter must be used to survey the hot work location and then must be left to constantly monitor the air between the flammable material and the immediate vicinity of the hot work.

- A survey of the area to identify any atmospheric conditions that might be toxic or that could be decomposed by the hot work.

- Welding or cutting on closed systems, such as tanks and pipelines, must be specifically approved by Corporate Health and Safety.

ATTACHMENT 4-4

DEMOLITION PLAN

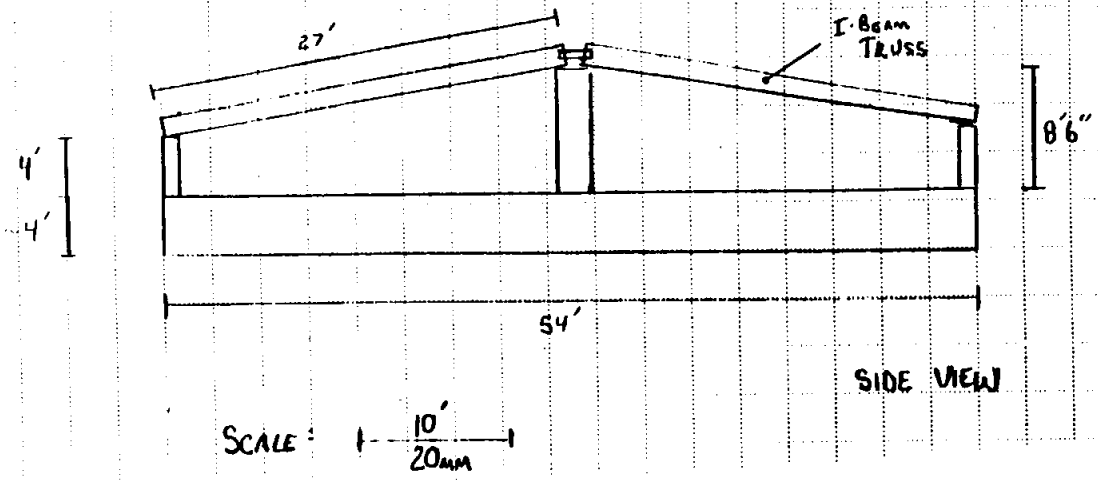
ADAMSITE STORAGE VAULTS
DEMOLITION PLAN

Building E-2370, the former Adamsite Storage Vaults, is located on the eastern side of the peninsula between Gunpowder River and the Bush River, in an area of Edgewood known as the Bush River Research Operations Area of APG, as shown in Figure 1-1 in Section 1 of this document. This demolition plan outlines the techniques and procedures that shall be implemented for the demolition of the aboveground steel roof, the aboveground concrete walls and the concrete columns of the Adamsite Storage Vaults.

1.0 Technical Approach

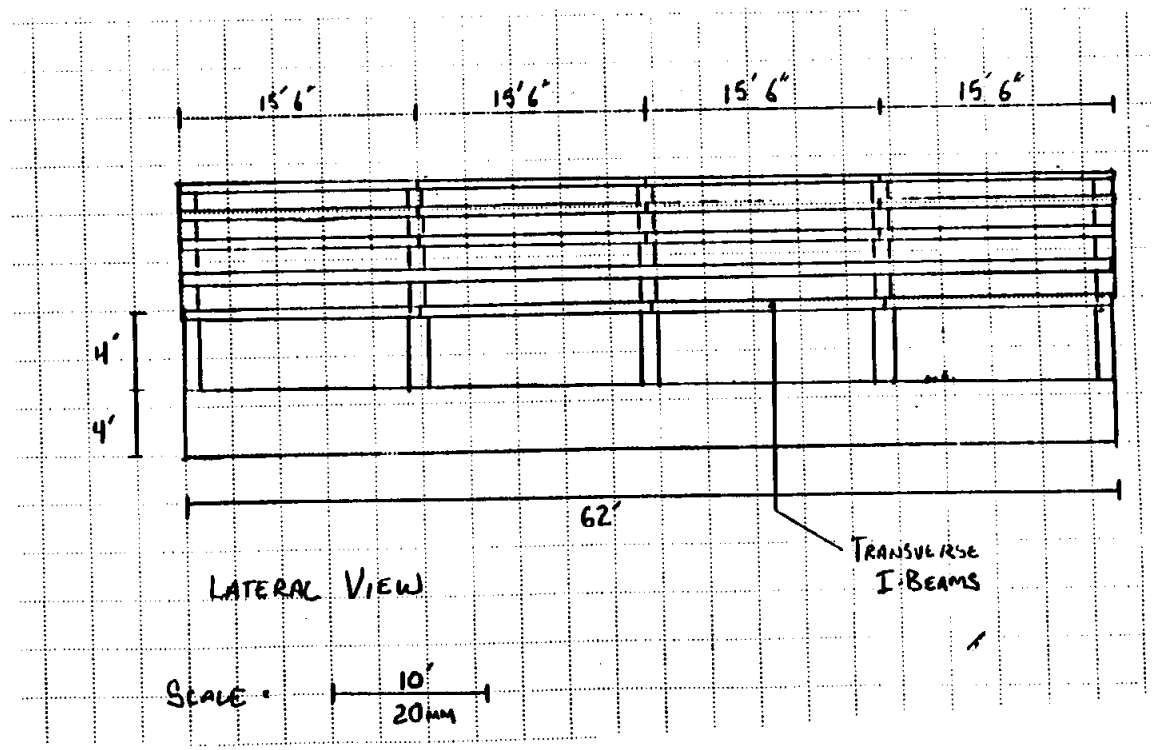
The building is constructed as two concrete vaults covered by a steel I-beam frame supporting corrugated steel sheeting for a roof. The two concrete vaults are constructed of one foot thick concrete walls and are separated by a two foot thick concrete wall. The walls of the vaults extend approximately four feet above the ground surface. The I-beam framework of the roof is supported by three rows of concrete columns, with four columns to a row. The two outside rows of columns are one foot by one foot in dimension and stand 4 feet above the vault walls. The center row of columns are two feet by two feet thick and stand 8.5 feet above the vault walls. The steel frame work supporting the corrugated steel sheeting is constructed using 27 feet long by 1.5 feet high I-beam trusses from the outside concrete columns to the center columns. The are four rows of trusses on either side of the Adamsite Vault roof and each row is connected at the top with a steel plate and rivets for lateral support. The steel I-beam trusses are interconnected by transverse 16 feet long by one foot high I-beam supports. There are five rows of transverse I-beams on both sides of the Adamsite Vault roof. Each row of I-beams are connected by steel plates and rivets to reduce lateral movement. These transverse I-beams create the framework to which the corrugated steel sheeting is attached. The corrugated steel sheets are approximately 4 feet by 8 feet in dimension and are attached to the transverse I-beams by steel rivets (See Drawings 4-4.1 and 4-4.2). WESTON plans a controlled demolition of the building using a crane, a oxygen/acetylene torch, and a hydraulic hammer attached to an excavator.

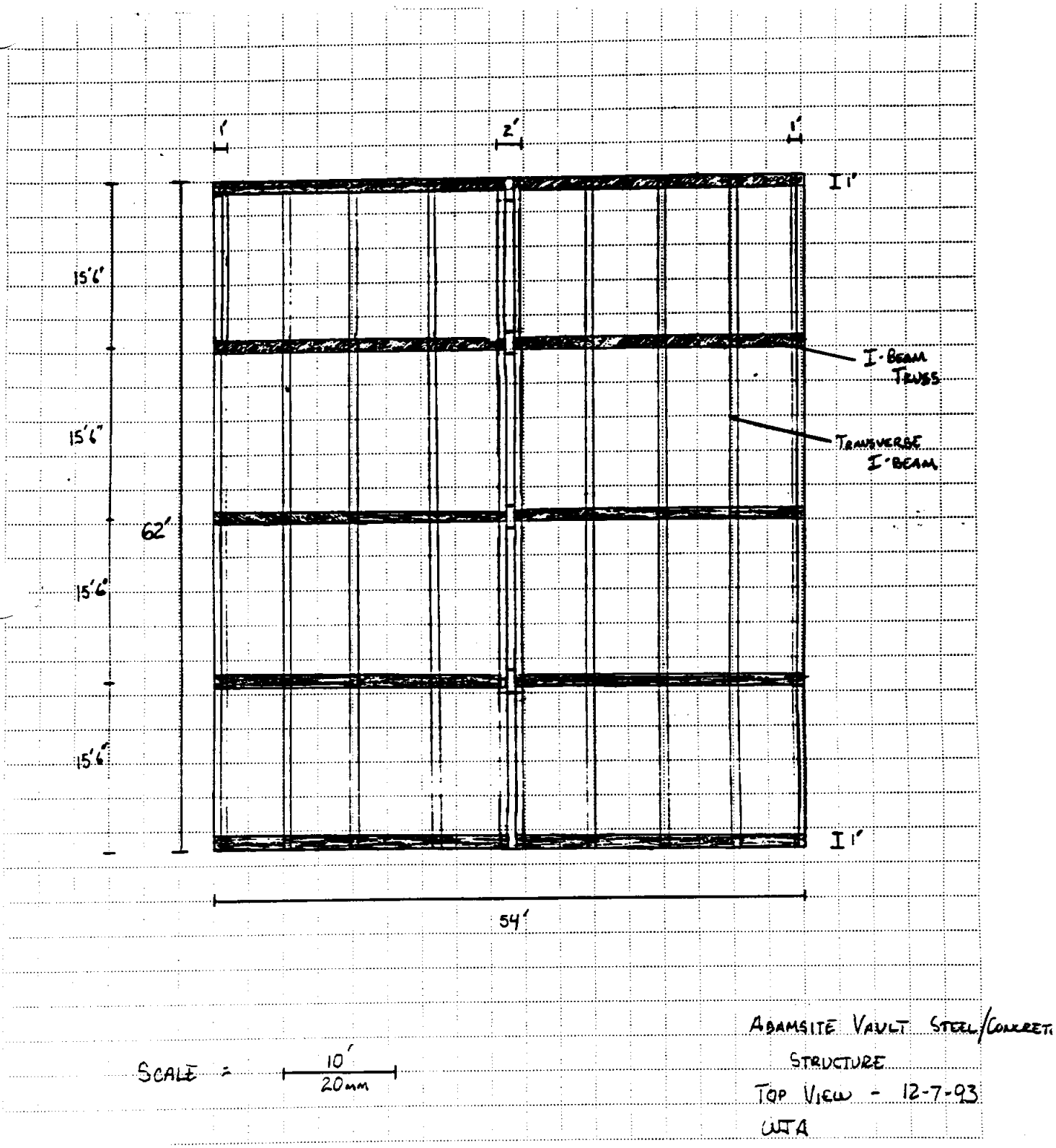
The building shall be dismantled piece by piece, tier by tier. The structure shall be dismantled using a person on a manlift with a oxygen/acetylene torch to cut the steel I-beams and roof panels. A crane shall be used to support the steel I-beams and corrugated steel roof sheets as they are cut to execute the controlled dismantling of the building. The concrete sidewalls and columns shall be demolished using a hydraulic hammer attached to an excavator to break up the concrete in place.



ADAMSITE VAULT
CONCRETE/STEEL STRUCTURE

WJA 12-7-93





DRAWING 4-4.2 - ADAMSITE VAULT STRUCTURE

The proposed sequence of removal/demolition for the Adamsite Vaults is as follows:

- The roof panels shall be removed first to facilitate access to the transverse I-beams. The roof panels shall be torch cut from the transverse I-beams while rigged to a crane. Two holes shall be cut into the roof panel to facilitate rigging the panel with the hooks and/or cables from the crane. The roof panels shall be cut from the transverse I-beams by torch cutting the rivets or the panel itself. The corrugated steel shall be removed one panel at a time and shall be placed in a staging area for disposal at DRMO.

- The transverse I-beams supporting for the roof panels shall be removed once the attached roof panels have been staged. These I-beams shall be torch cut from the steel trusses while rigged to a crane. Two holes shall be cut into the transverse I-beam to facilitate rigging the I-beam with the hooks and/or cables from the crane. The I-beams shall be removed by torch cutting the rivets which attach them to the trusses and the rivets which attach the I-beams to the next I-beam in the row. The I-beams may be cut instead of the rivets to facilitate a safe demolition, if necessary. The transverse I-beams shall be removed one at a time and shall be placed in a staging area for disposal at DRMO.

- The I-beam trusses shall be removed after all attached transverse I-beams have been staged. The trusses shall be torch cut from the concrete columns while rigged to a crane. Two holes shall be cut into the truss to facilitate rigging the I-beam with the hooks and/or cables from the crane. The truss shall be removed by torch cutting the rivets which attach them to the concrete columns. The I-beams may be cut instead of the rivets to facilitate a safe demolition, if necessary. Each truss shall be removed one at a time and shall be placed in a staging area for disposal at DRMO.

- The concrete sidewalls and columns of the vaults shall be demolished last. The sidewalls and columns which extend above the ground surface shall be broken into pieces using a hydraulic hammer attached to an excavator. The concrete demolition shall not take place until all steel I-beams and roof sheeting are removed. The concrete shall be placed into the vaults to be used as fill material.

2.0 Health and Safety

2.1 Site Inspection

Prior to demolition, a site inspection shall be conducted by a competent person to determine the condition of the structure and to insure a controlled dismantling of the building can be performed. A meeting shall take place prior to demolition of the building with the Site Manager, the SSHO and the demolition crew to review the technical approach for dismantling the building. Additionally, the site inspection and initial meeting shall review the following:

- All utilities such as gas, electric, water, and steam shall be disconnected prior to demolition activities.

- All hazardous chemicals, gases, explosive conditions, flammable materials, or dangerous substances shall be purged from the building prior to demolition activities. Air monitoring with a PID and/or a FID, and a CGI will confirm that none of these conditions exist on-site prior to conducting demolition activities.

- Staging areas shall be selected within the exclusion zone so as they can be accessed by the crane and the steel debris can be staged safely.

During demolition, continous inspections by a competent shall detect hazards resulting from deteriorated materials or improper demolition. No person shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other means.

2.2 Exclusion Zone

An exclusion zone shall be established which shall surround the work area for the demolition of the Adamsite Vaults. The area shall be sufficient in size to allow for the operation of the crane, the manlift, and staging of the metal debris in selected areas (See Figure 4-4.1). The exclusion zone shall be marked using barrier tape, traffic cones, and other highly visible boundary markers to keep unauthorized persons from entering the exclusion zone. Only those persons directly involved in the demolition process shall be allowed in the exclusion zone while demolition procedures are being conducted. No person shall be allowed inside the vault while demolition activities are being conducted.

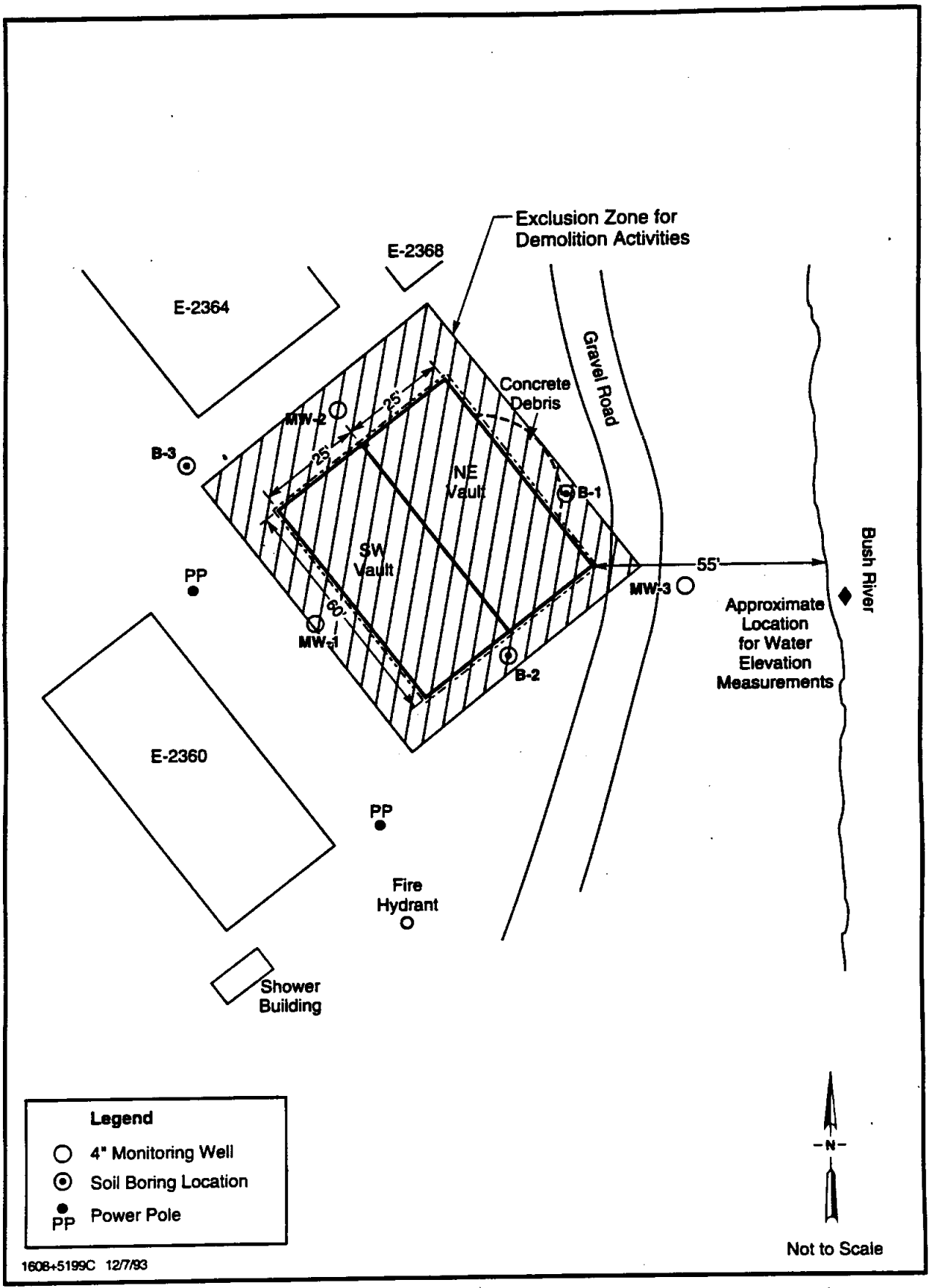


FIGURE 4-4.1 EXCLUSION ZONE DURING DEMOLITION ACTIVITIES

2.3 Demolition Crew

The demolition crew shall be provided by WESTON and shall be comprised of competent persons experienced with demolition activities. The crew shall be on site at all times during demolition activities and shall be comprised at a minimum of a Site Manager, the SSHO, a torch cutter, a crane operator, and any other person necessary to complete the controlled demolition of the former Adamsite Vaults. Only these people shall be allowed in the exclusion zone during demolition activities. **One** person of the demolition crew shall be designated to relay signals to the crane operator while demolition activities are conducted. This person shall remain in constant visual contact with the crane operator during demolition activities. See Figure 4-4.2 for hand signals to be used for operation with the crane.

2.4 Equipment

The demolition of the former Adamsite Vaults shall require the following equipment:

- Manlift
- Oxygen/acetylene torch with extended fuel supply lines.
- A minimum, 10-ton crane with full rigging.
- A minimum, 30,000 lb weight class excavator with a hydraulic hammer attachment.

2.5 Operations

All demolition activities shall be performed in a safe and efficient manner. The demolition crew shall pay attention to normal health and safety guidelines outlined in Section 4 of this document as well as those guidelines especially intended for demolition work. The following guidelines and practices shall be adhered to during demolition and are contained within the Standard Supplement:

- Hand and Power Tools (B-1.3)
- Heavy Equipment Operation (B-1.4)
- Ropes, Slings, Chains, and Hooks (B-1.7)
- Inclement Weather (B-1.8)
- Heat/Cold Stress (B-1.9)
- Hand Signals (B-1.10)
- General Site Safety Guidance (B-1.11)
- Demolition (B-1.18)

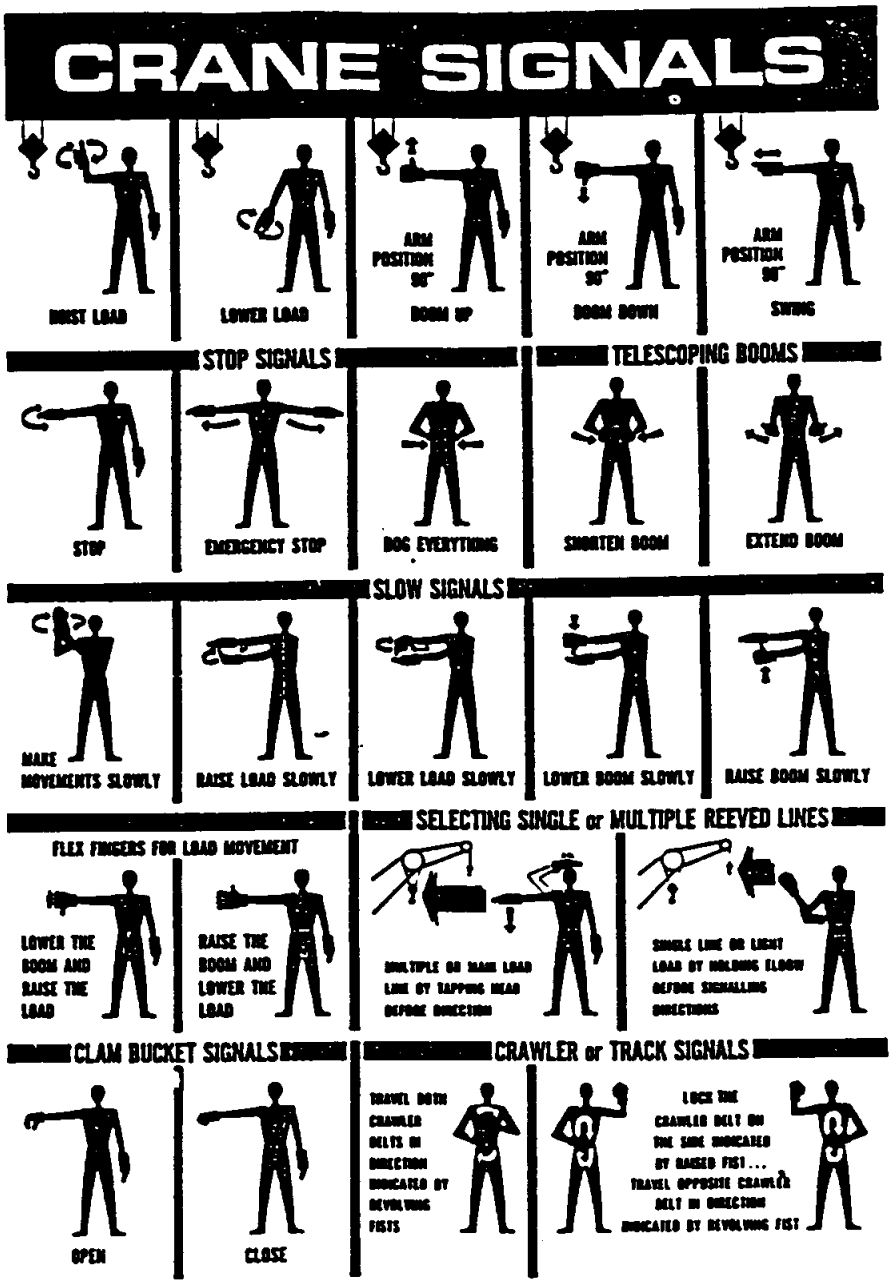


FIGURE 4-4.2 - HAND SIGNALS

- Working in Elevated Areas (See Attachment 4-4.A)
- Working with Cranes/Lifting Equipment (See Attachment 4-4.A)
- Aerial Lifts/Manlifts (See Attachment 4-4.A)
- Hot Work (See Attachment 4-4.A)

ATTACHMENT 4-4.A

DEMOLITION SAFETY GUIDELINES

2.4.9 Hot Work - FLD09

Health and Safety Plan Operating Procedures

Field Operating Procedure - FLD09 - Hot Work

No task(s) that produce heat, sparks or energy sufficient to serve as an ignition source may begin in any location that could potentially have ignitable atmospheres, until a Hot Work Protection Procedure has been instituted and a Hot Work Permit has been issued.

Examples of Hot work include welding, cutting, burning, soldering, grinding, use of power tools, and internal combustion engines.

Many operating facilities or clients will have internal hot work permitting practices. WESTON will use whichever is more conservative.

Corporate Health and Safety must approve the use of a client's Hot Work Permitting System.

The Site Health and Safety Coordinator is responsible for issuing hot work permits.

Expired hot work permits must be retained as part of the site or project health and safety file.

Permits must be reissued at the beginning of each day, each work shift, or if the area has not been monitored within 1/2 hour.

2.4.9.2 Hot Work Permit Procedures

- The SHSC is responsible for inspecting each site and determining the need for a Hot Work Permit Procedure.
- All WESTON employees, WESTON subcontractor employees, and any employees for whom WESTON has Safety oversight must be formerly notified and instructed of the requirement for, need for, and procedures for obtaining hot work permits.
- A fire watch is required for every activity where hot work could result in other than a minor fire due to ignition of combustibles.
- Fire extinguishing equipment commensurate with the ignitable matrix and training level of the firewatch must be immediately available at the hot work location.
- A combustible gas meter must be used to survey the hot work location and then must be left to constantly monitor the air between the flammable material and the immediate vicinity of the hot work.

- A survey of the area to identify any atmospheric conditions which may be toxic or which could be decomposed by the hot work.

- Welding or cutting on closed systems such as tanks and pipelines must be specifically approved by Corporate Health and Safety.

2.4.26 Working at Elevation - FLD25

Health and Safety Plan Operating Procedures

Field Operating Procedure - FLD25 - Working at Elevation

Related SPOPSFLDs:
- FLD08 - Confined Spaces Entry
- FLD19 - Working Over Water
- FLD26A - Portable Ladders
- FLD26B - Fixed Ladders
- FLD27 - Scaffolding - General

2.4.26.1 Engineering Control

Climbing stairs, working at elevation (more than four (4) feet above grade), on platforms, roofs or scaffolding; working on ladders, or performing activities where falls could result in injury, immersion in water or contact with chemicals requires provisions for preventing falling. Ideally this prevention will be provided by engineering control, safety railings, and toe boards, etc. Ladder use, circumstances in construction at hazardous materials sites, or environmental assessments may require Fall Protection PPE in addition to or instead of engineering controls.

2.4.26.2 Personal Protective Equipment

PPE Fall Protection devices, Lifeline Systems, consist of safety or body belts, safety harness, lanyards and safety lines. A grabbing device may be used to connect the lanyard to the safety line and act as a brake.

Prior to use of Fall Protection Equipment, personnel must be trained in use, maintenance, and inspection of the PPE. General safety training is to be supplemented with site specific training.

A Lifeline System must meet the Standards and Criteria of OSHA 1926.104 and ANSI A10.14, specifically:

1. The Anchorage point must be able to support a dead weight of 5,400 lb.

2. Lifelines must be of 3/4 inch manila or equivalent and have a minimum breaking strength of 5,400 lb. Lifelines used for rock work or which may be subjected to abrasion must be 7/8 inch wire core manila rope.

3. Safety Belt Lanyard must be a minimum of 1/2 inch nylon rope or equivalent, no longer than 6 feet and have a minimum breaking strength of 5400 lb.

2.4.26.2 Personal Protective Equipment (Continued)

4. Bolts, shackles, D-rings, snap hooks, and metal links must be able to bear a tensile load of 4,000 lb. without cracking, breaking, or permanent distortion.

5. All Lifeline System hardware shall be drop forged or pressed steel, cadmium plated in accordance with type 1 Class B Plating specified in Federal Specification QQ-P-416. Surfaces must be smooth and free of defects.

A person experienced in Lifeline Systems use must inspect the entire system before and after each use and at regular (monthly) intervals between uses. Lifeline Systems elements showing any sign of stress or damage or which have been used to break a free fall shall be taken out of service immediately and destroyed.

Choice of a lifeline system for each HASP will be based upon the actual needs of the activity and must be approved by the Corporate Health and Safety Director or his approved delegate.

2.4.25 Aerial Lifts/Manlifts (Continued)

- A manual of inspection and operation must be kept with the lift or be immediately available and must contain instructions for use as well as clearly indicating capacity, height limits, restrictions, warnings, and cautions.

- A statement of insulation must be prominently displayed on the unit.

- Posted on the machine must be the name and address of manufacturer, listing of acceptable alterations or alternative operating procedures and a notice to operators to read and thoroughly understand the operating instructions before use.

Prior to moving over a highway or travel where overhead utility lines or obstructions may be present, ladders, platforms or towers must be locked in the down position.

- When moving with the boom up, an inspection must be made of the entire route of the move to ensure there are no obstructions, overhead utilities, underpasses or ground/terrain conditions that would prohibit a safe move.

- The operator/driver must have unobstructed view of his path of travel and a safe speed must be maintained.

- A recorded inspection must be made to ensure proper cradling of ladders, booms, platforms or towers, and stowage of outriggers.

2.4.24 Cranes/Lifting Equipment - FLD23

Health and Safety Plan Operating Procedures

Field Operating Procedure - FLD23 - Cranes/Lifting Equipment

Related SPOP: FLD22A - Heavy Equipment Operation - General
FLD24 - Aerial Lifts/Manlifts

Any piece of equipment used for lifting materials or personnel shall be used and maintained in strict accordance with manufacturer's directions and applicable OSHA regulations.

Load limits will be visibly posted on all lifting devices.

Only operators with demonstrated competence shall be permitted to operate lifting devices.

Lifting machinery and all elements of equipment involved in lifting or supporting loads must be inspected prior to use and at a minimum monthly. Inspections must be performed by a competent person and must be documented.

SECTION 5

FIELD SAMPLING AND ANALYSIS PLAN (FSAP)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SECTION 5

FIELD SAMPLING AND ANALYSIS PLAN (FSAP)

5.1 INTRODUCTION

The objective of DO No. 10 is to provide removal actions to mitigate potential hazards to human health and the environment from contaminants remaining in the vaults and surrounding areas. WESTON's efforts shall be focused on control of the spread of harmful constituents that historically have been placed at the site. WESTON has developed this comprehensive Field Sampling and Analysis Plan (FSAP) to support these removal actions. This plan is intended to be used with Attachment C of the Standard Supplement, the Chemical Data Acquisition Plan (CDAP). The following methods and procedures are presented and discussed in the SSWP: REPLACE

- Sampling equipment and procedures.
- Parameters and analytical methods.
- Sample packaging and shipment.
- Sample custody.
- Decontamination procedures for sampling equipment.

5.2 CONTRACTOR PROJECT ORGANIZATION AND FUNCTIONAL AREA RESPONSIBILITIES

WESTON proposes to use General Physics (GP), located in Gaithersburg, MD, to conduct disposal parameter and characterization parameter analyses.

This subsection identifies the WESTON and GP analytical requirements. Attachment C of the Standard Supplement, the CDAP, identifies methods and laboratory QA information for the laboratory. REPLACE

5.2.1 Project Personnel

WESTON shall provide a staff of experienced administrative, construction, and technical professionals to serve as the key personnel for all phases of DO No. 10. These personnel were selected based on their directly related management and technical abilities. To ensure optimum communication during execution of DO No. 10, WESTON has assigned Mr. Peter A. Ciotoli, AICP, as the Program Manager and Ms. Jeanne O'Leary as the DO Project Manager. Their resumes are contained in Attachment A-1 of the Standard Supplement. Figure 5-1 presents the overall organizational structure for the management of DO No. 10. REPLACE

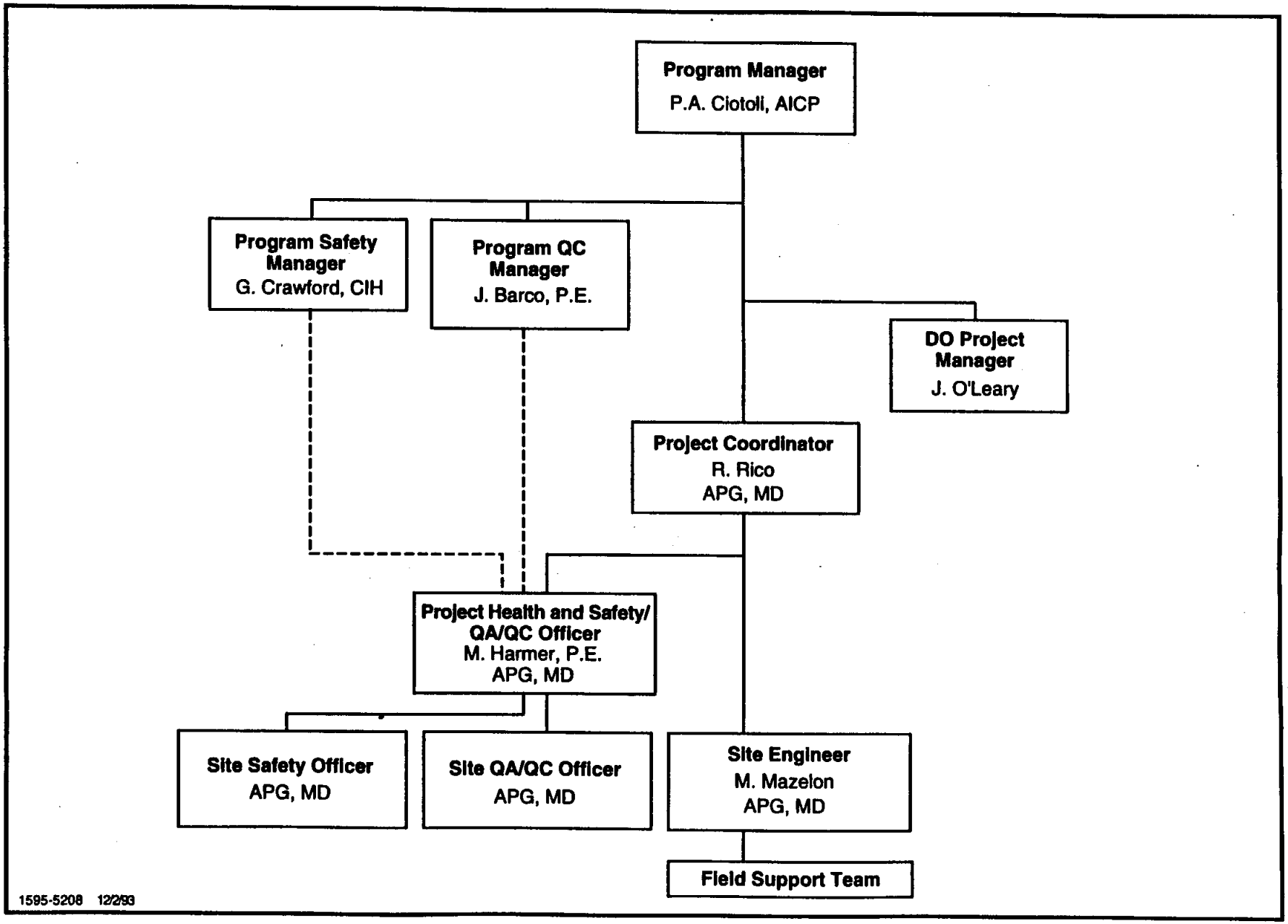


FIGURE 5-1 PROGRAM ORGANIZATION CHART FOR DELIVERY ORDER NO. 10

5.2.2 QA Personnel Responsibilities

Individuals accountable for implementing the QA aspects of the CDAP (Attachment C of the Standard Supplement) are shown in Figure 5-1. Their responsibilities are indicated in the subsections that follow.

5.2.2.1 WESTON Program QC Manager

Mr. Joseph Barco, P.E., shall be WESTON's Program QC Manager for the deliverables and field activities of the DO No. 10 removal actions. He shall be accountable for auditing compliance of the program with the SSWP. He shall conduct periodic audits to verify adherence of activities to the provisions of the CDAP and the FSAP.

5.2.2.2 Site QA/QC Officer

The Site QA/QC Officer is accountable for ensuring the implementation of the CDAP as it applies to all field sampling, monitoring, and analysis processes performed for the duration of DO No. 10. Specifically, the Site QA/QC Officer is accountable for oversight of the following during sampling activities:

- Correct sample collection (i.e., number of samples, sample locations, and parameters).
- Proper sample container preparation and labeling.
- Sample preservation and transportation.
- Sample chain-of-custody.
- Proper sampling procedures.
- Field documentation.
- Field calibration of equipment.
- On-site performance audits.
- Accuracy of field calculations.

At this time, the Site QA/QC Officer has not been identified. This position is to be filled by a person who meets or exceeds all of the requirements for this position, as stated in the basic contract. WESTON has a pool of qualified personnel who can fill the position of Site QA/QC Officer. One of these qualified persons shall be selected prior to the start of field-work. Resumes for some of the prospective personnel for this position are contained in Attachment 2-1.

5.2.3 Laboratory Responsibilities

GP shall be conducting the laboratory analyses for DO No. 10. GP shall conduct disposal parameter and characterization parameter analyses for all samples.

The responsibilities for the key personnel at each laboratory are described in Attachment C of the Standard Supplement. Resumes for laboratory personnel can be found in Attachment C-1.

5.3 FSAP

5.3.1 Site Location/Background Information

The Adamsite Storage Vaults are located on the eastern side of the peninsula between Gunpowder River and the Bush River, in an area of Edgewood known as the Bush River Research Operations Area of APG. There are two vaults separated by a 2-ft-thick wall beneath a steel roof that is supported by concrete posts. The activities outlined in this SSWP involve the removal and securement actions at the vaults.

Currently, both vaults are partially filled with water and/or sediment that has infiltrated from an unknown source (groundwater infiltration is suspected) and/or remains from past operations. Samples collected from the water and sediments in the vaults show that the water contains no contaminants that would characterize it as hazardous under RCRA parameters defined in 40 CFR 261. Three of six soil borings performed in July and August 1993 by WESTON from around the vault indicated detectable levels of arsenic, PCBs, and mercury in the upper 6 inches of the soil. Arsenic was detected above the RCRA Corrective Action Level at soil boring B-2 collected from a depth of 0 to 6 inches. PCBs were detected above the RCRA Corrective Action Level in the soil boring for monitoring well MW-2 at a depth of 0 to 6 inches. Beryllium was also detected at the monitoring well soil borings for MW-1, MW-2, and MW-3. Mercury was detected above the RCRA Corrective Action Level at soil boring B-3. Results for previous sampling conducted at the Adamsite Storage Vaults by WESTON in July/August 1993 are contained in Section 1, Attachment 1-3, of this SSWP.

5.3.2 Sampling Objectives

The sampling objectives of DO No. 10 are to retrieve and analyze samples of the excavated soils for disposal purposes, retrieve and analyze samples of the bottoms and sidewalls at the excavation areas for characterization purposes, and retrieve and analyze samples of decontamination fluids, if needed. These activities shall be performed in a manner that minimizes potential exposure of contaminants to the environment and to personnel. The subsections that follow outline sampling strategy, analytical parameters, and QA/QC requirements for the sampling activities.

5.3.2.1 Sampling Strategy

DELETE

The proposed number and locations of samples to be collected from the excavated areas and removed soils are shown in Table 5-1. The number of samples to be collected from each excavation may vary based on reassessment after a visual inspection of the amount of soil removed. After the inspection, WESTON shall reconfirm the number and locations of samples with CEAAO and obtain concurrence.

5.3.2.1.1 Excavation Areas

DELETE

There are four areas of excavation anticipated near the Adamsite Storage Vaults: the area near soil borings B-2 and B-3; one surface stained area near the NE vault; and the area near monitoring well MW-2. In addition, any other area of visibly stained soil shall be excavated. Each excavated area shall be sampled to characterize the extent of contamination. WESTON anticipates retrieving one composite sample comprised of five aliquots retrieved from each excavation area (four aliquots from the bottom of the excavation, and one aliquot from the sidewall). Soil samples collected from these areas shall be analyzed for the characterization parameters indicated in Table 5-1.

5.3.2.1.2 Excavated Soils Sampling

DELETE

The soil removed from each excavation area shall be segregated and stockpiled at properly bermed staging areas on-site. WESTON anticipates retrieving one composite soil sample for each pile of stockpiled soil. Each composite soil sample shall consist of five aliquots collected from the stockpile. Soil samples collected from the stockpiled soil shall be analyzed for the disposal parameters indicated in Table 5-1.

5.3.2.1.3 Decontamination Water (If Necessary)

Decontamination fluids, which shall have been containerized and staged, shall be sampled and analyzed for the disposal parameters indicated in Table 5-1, if necessary. One grab

Table 5-1

DO No. 10
Proposed Sampling and Analysis Strategy

Sample Type	Matrix	Estimated Number of Samples[a]	Laboratory/Organization	Parameter	Sampling Method	Number of Containers
Excavation areas: • Final characterization (0 to 6 inches)	Soil/solid	4[b] (1 composite per excavated area) +1 QC - dup. set (+1 QA- split set)	GP, USACE Environmental Laboratory	TAL/TCL	Composite	(20) 250-mL amber glass (10) 100-mL amber glass
Stockpiled soil from excavation areas: • Disposal characterization	Soil/solid	4[b] (1 per stockpile of soil) +1 QC - dup. set (+1 QA- split set)	GP, USACE Environmental Laboratory	TCLP metals, corrosivity, and ignitibility	Composite	(12) 250-mL amber glass
				TCLP volatiles	Grab	(12) 125-mL wide-mouth with Teflon septum
				TCLP semivolatiles, TCLP pesticides/ PCBs, and herbicides	Composite	(12) 250-mL amber glass
				Reactivity	Composite	(12) 250-mL amber glass
				TPH	Composite	(12) 250-mL amber glass

Table 5-1

DO No. 10
Proposed Sampling and Analysis Strategy
(Continued)

Sample Type	Matrix	Estimated Number of Samples[a]	Laboratory/Organization	Parameter	Sampling Method	Number of Containers
Decontamination fluids: • Disposal characterization	Aqueous liquid	1[b] +1 QA - split set	GP, USACE Environmental Laboratory	TCLP metals	Composite	(2) 1-L plastic/HNO_3 to pH <2
				TCLP volatiles	Composite	(4) 40-mL amber glass with Teflon septum
				TCLP semivolatiles	Composite	(4) 1-L amber glass
				TCLP pesticides/ PCBs	Composite	(4) 1-L amber glass
				TCLP herbicides	Composite	(2) 1-L amber glass
				Reactivity, corrosivity, nitrate, ignitibility, and pH	Composite	(2) 1-L plastic
				TOC/total phosphorus/TPH	Composite	(2) 1-L plastic/ H_2So_4 to pH <2
				Oil and grease	Composite	(2) 1-L amber glass/ H_2So_4 to pH <2

Notes:

[a](1) Trip blank for each shipment of samples.
(2) Rinsate blank for each medium for each day of sampling to be analyzed for respective sample analytical parameters.

[b]Actual number of samples shall be determined based on the actual amount of soil removed, and the amount of decontamination fluid recovered. Other sampling and analysis may be required following the visual inspection of the vaults.

sample representative of the decontamination fluid shall be collected unless additional samples are determined to be necessary based on the amount of decontamination fluid generated.

5.3.3 Sampling Procedures and Equipment

Sampling shall be conducted with personnel safety as a priority. Therefore, due to the hazardous nature of the possible contaminants, WESTON shall perform sampling activities in LOP appropriate to the contaminants. These levels are presented in Section 4, the SHERP.

In accordance with APG-EA sample shipment protocols, all samples shall be screened and analyzed for chemical agent compounds (CAC) prior to off-site shipment. Samples and/or representative aliquots of the samples shall be screened for CAC at the APG Chemical Transfer Facility (CTF) by the Edgewood Research, Development, and Engineering Center (ERDEC) by headspace screening. SciTech Laboratory, under subcontract to ERDEC, shall perform CAC analysis. Upon verification that no CAC are present in the samples, WESTON shall ship the samples to the designated laboratory and/or perform resampling at locations immediately adjacent to the original sample collection points, if sample holding times have been exceeded.

5.3.3.1 Soil Sampling

Soil samples collected from each of the excavation areas and the soil stockpiles shall be analyzed for the parameters listed in Table 5-1. The following protocol shall be implemented to collect a representative composite soil sample:

1. Set up air monitoring equipment.

2. Set up contamination control measures, where appropriate, and assemble sampling equipment.

3. Properly cleaned stainless steel sampling instruments shall be used when collecting soil samples.

4. Prior to sample collection, field personnel shall don protective gloves over their outer gloves to prevent the contamination of samples.

5. Collect a composite sample with a stainless steel trowel and a stainless steel bowl and deposit it into laboratory-cleaned collection bottles.

6. Document the physical appearance of the material sampled on the field data sheets.

7. Prepare and maintain chain-of-custody forms.

8. Identify, preserve (as necessary), package, and ice samples for shipment.

9. Advise laboratories of sample shipment (the USACE laboratory must be notified 48 hours before shipment).

10. Ship samples to laboratory per appropriate guidelines.

5.3.3.2 Decontamination Fluid Sampling

The following protocol shall be used to collect a representative sample of the decontamination fluids contained in drums and/or similar containers, if necessary:

1. Assemble sampling equipment.

2. Set up contamination control measures, where appropriate.

3. Set up air monitoring equipment.

4. Prior to sample collection, field personnel shall don protective gloves over their outer gloves to prevent the contamination of samples.

5. Lower a transparent thieve tube sampler, a Coliwassa sampler (of appropriate length), or a similar device into the container. Take care to ensure that the tube is extended to the bottom of the container in order to retrieve a representative sample of the entire depth of the decontamination fluid.

6. Retrieve the sampler.

7. Transfer the material into laboratory-cleaned collection bottles.

8. Document the physical appearance of the material in the samples (i.e., color and depth in the sampler).

9. Prepare and maintain chain-of-custody forms.

10. Identify, preserve (as necessary), package, and ice samples for shipment.

11. Advise laboratory of sample shipment (the USACE laboratory must be notified 48 hours before shipment).

12. Ship samples to laboratory per appropriate guidelines.

5.3.3.3 Sampling Equipment

The following list of equipment shall be required during sampling activities:

- Polysheeting.
- Sandwich-size "ziploc" sealable plastic bags.
- Appropriate sample collection bottles.
- Laboratory-prepared methyl alcohol rinsate solution.
- Stainless steel spoons, scoops, and bowls.
- Sample preservatives.
- Air monitoring equipment.
- Spill control equipment.
- PPE.
- Equipment decontamination materials.
- Packaging materials and ice.
- Shipping coolers.
- Coliwasa samplers, thief tubes, and/or similar.

5.3.4 Sample Analysis and Handling

5.3.4.1 Sample Analysis

WESTON proposes to use GP to conduct all environmental analyses.
DELETE

Table 5-2 indicates the proposed analytical methods for DO No. 10. These analytical parameters and methods were selected based on the disposal parameters typically required by CEAAO and DSHE Hazardous Waste Branch for disposal of wastes from APG-EA and for characterization purposes during removal actions.

5.3.4.2 Sample Container Requirements, Preservation, and Holding Times

Sample containers shall be provided by WESTON and selected based on the compatibility of the chemicals of concern for the container, the sample medium, and the analytical requirements. Container volumes, preservation procedures, and holding times for each respective analyte are identified in Table 5-3. These containers shall be precleaned by the vendor in accordance with EPA protocols. Each lot of these containers shall be analyzed in accordance with the vendor's QC requirements and shall not be released for sale unless the QC requirements are met.

Table 5-2

Analytical Parameters and Methods

Parameter	Technique	Aqueous Liquid/Wipe	Soil and Solids	Nonaqueous Liquids
TAL or TCLP Metals[a]: Mercury	ICP/GFAA CVAA	6010[b] 7470	6010[b] 7470	6010[b] 7470
TCL or TCLP Volatiles[a]	GC/MS	8240	8240	8240
TCL or TCLP Semivolatiles, CS, CN[a]	GC/MS	8270	8270	8270
TCL or TCLP Pesticides[a]/PCBs[c]	GC/EC	8080	8080	8080
TCLP Herbicides[a]	GC/EC	8150	8150	8150
Ignitibility[a]		1010	1010	1010
Corrosivity (pH)[a]		9040	9040	9040
Reactivity (cyanides/sulfides)[a]		9010/9030	9010/9030	9010/9030
pH[a] Total Organic Carbon[a] Total Phosphorus[d] Nitrate[a] Oil and Grease[a]		9040 9060 424 9200 9070		
TPH	IR	418.1[f]	418.1[f]	

Key: GC = Gas chromatography.
GFAA = Graphite furnace atomic absorption.
CVAA = Cold vapor atomic absorption.
GC/EC = Gas chromatography/electron capture.
GC/MS = Gas chromatography/mass spectrometry.
ICP = Inductively coupled plasma emission spectroscopy.
IC/ECD = Ion chromatography/electrochemical detector.

Notes:

[a]Samples will be extracted for TCLP analyses using SW-846, Method 1311; the zero headspace methodology will be employed for the volatile fraction. [b]GFAA for arsenic - 7060; lead - 7241; and selenium - 7740. [c]Toxaphene - GC/MS 8270. [d]Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985. [e]Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020 and EPA-600/4-82-055. [f]40 CFR, Part 763, Subpart F, Appendix A.7

Table 5-3

Sample Containers, Preservation, and Holding Times

Parameter	Sample Container	Preservation	Holding Time
TCLP and/or TAL/TCL Analytes			
Metals:			28 days (Hg)
Aqueous liquids/wipe	1-L plastic	HNO_3 pH<2 Ice to 4° C	Others: 6 months
Soils and solids	(2) 250-mL amber glass	Ice to 4° C	6 months
Nonaqueous liquids	1-L amber glass	Ice to 4° C	6 months
Volatiles:			
Aqueous liquids/wipe	(2)-40-mL amber glass with Teflon septum	Ice to 4° C	7 days
Soils and solids	100-mL-amber glass with Teflon septum	Ice to 4° C	7 days
Nonaqueous liquids	100-mL-amber glass with Teflon septum	Ice to 4° C	7 days
Semivolatiles:			
Aqueous liquids/wipe	(2) 1-L amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Soils and solids	250-mL amber glass	Ice to 4° C	7 days after extraction 40 days after extraction
Nonaqueous liquids	250-mL amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Pesticides/PCBs:			
Aqueous liquids/wipe	(2) 1-L amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Soils and solids	250-mL amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Nonaqueous liquids	1-L amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Herbicides:			
Aqueous liquids/wipe	1-L amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Soils and solids	250-mL amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Nonaqueous liquids	250-mL amber glass	Ice to 4° C	7 days for extraction 40 days after extraction
Ignitibility	250-mL amber glass	Ice to 4° C	None

Table 5-3
Sample Containers, Preservation, and Holding Times
(Continued)

Parameter	Sample Container	Preservation	Holding Time
Corrosivity (pH)	250-mL amber glass	Ice to 4° C	Immediate
			%Reactivity (cyanides/sulfides):
			Aqueous liquid/wipe
			1-L plastic
			Ice to 4° C
			7 days
		Cyanide: NaOH to pH >12 Sulfide: NaOH to pH >9 and zinc acetate	
Soils and solids	1-L plastic	Ice to 4° C	7 days
Nonaqueous liquids	1-L plastic	Ice to 4° C	7 days
pH	250-mL amber glass	Ice to 4° C	Analyze immediately
Nitrate	250-mL amber glass	Ice to 4° C	48 hours
TOC	250-mL amber glass	H_2SO_4 to pH<2 Ice to 4° C	28 days
Total Phosphorus	250-mL amber glass	Ice to 4° C	28 days
Oil and Grease	1-L amber glass	H_2SO_4 to pH<2 Ice to 4° C	28 days
TPH	250-mL amber glass	None	28 days

5.3.4.3 QA/QC Samples

QA samples shall be sent to the USACE laboratory by overnight delivery. These split samples shall represent approximately 10% of the field samples. WESTON shall coordinate with the laboratory at least 48 hours before sampling to ensure that the QA laboratory is prepared to receive the samples.

QC samples shall be collected by the sampling team and sent to the laboratory in the form of duplicates. The identity of these samples shall be unknown to the analysts until the data are in deliverable form. QC samples represent approximately 10% of the field samples.

Rinsate blanks shall be taken at a frequency of each sampling event, if necessary. The samples shall consist of deionized (DI) water from a final rinse of the sampling equipment after the decontamination procedure has been performed. Rinsate blanks shall be analyzed for the same disposal parameters listed in Table 5-1 for decontamination fluids.

Trip blanks shall be supplied by the laboratory at a frequency of one per batch or trip. These consist of DI water kept with the field sample containers from the time they leave the laboratory until the time they are returned to the laboratory.

5.3.5 Sample Identification, Chain-of-Custody, and Shipment

5.3.5.1 Sample Identification

Field personnel shall be accountable for uniquely identifying, labeling, tagging, providing proper preservation, and packaging samples to preclude breakage during shipment.

Every sample label shall include the following information:

- Project number and site name.
- Unique sample number.
- Sample description (location, depth, etc.).
- Sampling date and time.
- Initials of sampling technician.
- Method of sample preservation/conditioning, if any.

Prior to sample collection, labels shall be affixed to sample containers using transparent tape. Indelible waterproof ink shall be used for all logbook, sample label, and sample tag entries. REPLACE

5.3.5.2 Chain-of-Custody

An overriding consideration for environmental data is the ability to demonstrate that samples have been obtained from the locations stated, and that they have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal shall be documented to accomplish this goal. Documentation shall be accomplished through a chain-of-custody record that records each sample and the individuals accountable for sample collection, shipment, and receipt.

A sample is considered "in custody" if it is:

- In a person's actual possession.
- In view after being in physical possession.
- Locked up so that no one can tamper with it after having been in physical custody.
- In a secured area, restricted to authorized personnel only.

Sample custody shall be initiated by WESTON upon collection of samples. Chain-of-custody forms shall be placed in waterproof plastic bags and taped to the inside or outside lid of the cooler. The cooler shall be sealed with chain-of-custody seals. Documents specifically prepared for such purposes shall be used for recording pertinent information about the types and numbers of samples collected and shipped for analysis. An example chain-of-custody form is included as Figure 5-2. Sample identification numbers shall be included on the chain-of-custody form to ensure that no error in identification is made during shipment.

5.3.5.3 Sample Shipment

Samples shall be placed in containers compatible with the intended analysis and properly preserved prior to shipment to the laboratory. Each sealed container shall be placed in a polyethylene bag. If necessary to meet Federal Register shipping requirements, the bagged sample will be placed in a metal can with vermiculite and a bagged ice/gel pack. The bagged sample container (or the metal can sample container) shall be placed in a strong thermal ice chest or similar device to ensure sample integrity during shipment. Ice or an equivalent shall be added to cool the samples to at least 4° C. A chain-of-custody form shall be placed in a plastic bag and taped to the inside or outside lid of the cooler. The cooler shall be sealed with a chain-of-custody seal.

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client _____

Work Order _____

Date Rec'd. _____ Date Due _____

RFW Contact _____

Client Contact/Phone _____

Refrigerator#											
#/Type Container											
Volume											
Preservative											
ANALYSES REQUESTED →											
WA Use Only Lab ID	Client ID/Description	Matrix	Date Collected								

Matrix:
S - Soil
SE - Sediment
SO - Solid
W - Water
O - Oil
A - Air
WI - Wipe
DS - Drum Solids
DL - Drum Liquids
F - Fish
L - EP/TCLP Leachate
X - Other

Special Instructions:

Item/Reason	Relinquished by	Received by	Date	Time	Item/Reason	Relinquished by	Received by	Date	Time

WESTON Analytics Use Only

Samples Were:
1 Shipped or Hand-Delivered
NOTES:

2 Ambient or Chilled
NOTES:

3 Received Broken/Leaking (Improperly Sealed)
Y N
NOTES:

4 Properly Preserved
Y N
NOTES:

5 Received Within Holding Times
Y N
NOTES:

COC Tape Was:
1 Present on Outer Package Y N
2 Unbroken on Outer Package Y N
3 Present on Sample Y N
4 Unbroken on Sample Y N
NOTES:

COC Record Was:
1 Present Upon Receipt of Samples Y N

Discrepancies Between Sample Labels and COC Record? Y N
NOTES:

RFW 21-21-001 [illegible]/88

FIGURE 5-2 CHA[illegible]OF-CUSTODY FORM

7-115

This packaging and shipping shall be in accordance with EPA and/or IATA protocol. Prior to shipment, a QC check shall be performed by the Site QA/QC Officer to ensure that the samples have been properly identified and packaged, and that appropriate documentation (chain-of-custody) shall accompany them.

5.3.6 Documentation

Bound, weatherproof field notebooks shall be maintained by the field team. Notebooks shall be constructed such that pages cannot be removed without tearing. Team members shall record all information related to sampling procedures, time, field and weather conditions, unusual events, and field measurements in the notebooks and/or on the Field Data Sheets. Only waterproof, indelible ink pens shall be used to record information in any notebook.

In order to maintain complete and accurate documentation during sampling activities, Field Data Sheets shall be completed by sampling personnel. As shown in Figure 5-3, the Field Data Sheet details the sample location, sample type, and analyses to be performed. This form shall aid in both the identification and management of all sampling activities.

RETAIN

5.3.7 Decontamination Procedures for Sampling Equipment

Sampling equipment shall be decontaminated in the contamination reduction zone unless disposable sampling equipment is used. The following procedures shall be used to decontaminate sampling equipment:

1. Dislodge gross contamination with sampling utensils.
2. Scrub with an appropriate brush in a phosphate-free detergent.
3. Rinse with tap water.
4. Rinse with DI water.
5. Rinse with methyl alcohol.
6. Final rinse with DI water.
7. Air dry.

All waste (decontamination fluids and personnel protective clothing) generated during decontamination procedures shall be stored in 55-gallon drums on-site until subsequent disposal has been arranged. Personnel decontamination is addressed in the SHERP.

FIELD DATA SHEET

No: APG-000

Roy F. Weston, Inc.
Aberdeen Proving Ground
Contract No: DACA87-90-D-0031

Site: _____
Work Order No.: _____
C-O-C No.: _____

Sampling Date & Time: _____
Sample Location: _____
Project Manager: _____

Sampler (s): _____
Lab Shipped to: _____
CEAAO Rep.: _____

SITE DESCRIPTION

landfill	old field	upland palustrine
industrial	wooded	lowland riverine
commericial	farmland	lacustrine
residential	gully	disposal area
hedgerows	floodplain	other:

SOIL TYPE

rock	clay
gravel	muck
sand	loam
silt	peat
color _____	

SURFACE WATER

color _____
odor _____
flow _____
direction ____

STREAM

width _____
depth _____
velocity ____cm/s
pools _____ %
riffles _____ %

BOTTOM

rock	silt
rubble	clay
gravel	shell
organic	gravel
other: _____	

SAMPLE TYPE:

surface water	drum/tank-liquid
ground water	drum/tank-solid
sediment	air monitoring
soil	other(specify):
sludge	

SAMPLE INFORMATION:

color _____
odor _____
temp _____
pH _____
other(specify):

COLLECTION DEVICE:

thief	ponar
colliwasa	bailer
bucket	DAAMS
kemmerer	ekman
trowel	other(specify):

ANALYSES TO BE PERFORMED

ORGANICS:
volatiles
semivolatiles
pesticides
PCBs
herbicides
full TCLP
full TCL
CSM
degradation products
explosives
other(specify):

METALS:
TAL
priority pollutant
other(specify):

MISC.:
oil & grease
TOC
phosphate
nitrate
gross α & β; Γ spec
other(specify):

SAMPLE PREPARATION

CONTAINER:
glass jar
plastic jar
acetate core
plastic bag
plastic bucket
stainless container
4L plastic

PRESERVATIVE:
none
cool 4°C
HNO_3
H_2SO_4
HCl
NaOH
Zn Acetate
Na_2S_2O3
other(specify):

AIR SAMPLING:

sampling method _____
sample flow rate _____
special shipping instuctions _____
collection media _____
sampling time _____

COMMENTS:

FIGURE 5-3 FIELD DATA SHEET

SECTION 6

GEOTECHNICAL PLAN

(NOT REQUIRED FOR THIS DELIVERY ORDER)

SECTION 7

SURVEY PLAN

(NOT REQUIRED FOR THIS DELIVERY ORDER)

SECTION 8

ENVIRONMENTAL PROTECTION PLAN

TABLE OF CONTENTS

LIST OF TABLES

- Attempt to cover the drum(s) with soil or use dikes to contain the spill until the most appropriate and safest remedial response can be determined.

8.5.3 Spills Involving Dangerous or Potentially Dangerous Materials

In the event of spills involving dangerous or potentially dangerous materials, all field personnel (i.e., WESTON, subcontractors, and CEAAO personnel) shall be moved on-site or off-site upwind to a safe distance or to the primary or secondary evacuation point. The appropriate level of PPE applicable shall be determined as defined in the SHERP. The leaking material shall be controlled to prevent its spread by using an earthen dike, channel, and/or absorbent, as appropriate.

Vapor emissions shall be suppressed with water mist or foam, if appropriate. The leaking container shall be approached in appropriate PPE, as defined in the SHERP, and an attempt made to patch, plug, or overpack, as needed. The release or spill shall be reported by dialing "17" on a military telephone, or 676-0960 commercial/mobile. Dangerous spills shall be reported to CEAAO and the DSHE Project Officer as soon as possible after notifying the Base emergency response unit (if a representative is not on-site). DSHE shall make the appropriate notifications to federal, state, and local agencies when DSHE deems it necessary.

8.5.4 Cleanup of Spilled Material

8.5.4.1 Liquid Spills

In the event of liquid spills, attempts should be made to transfer all spilled liquid into an appropriate vessel or recovery drum(s). Any remaining liquid shall be absorbed through the use of appropriate absorbents, and the absorbents used shall be placed in a recovery drum(s).

All drum(s) used in the recovery of the spilled material should be sealed and appropriately labeled. The information that shall be identified on the label includes the storage date, source of the material, and other applicable information.

Any resulting empty drum(s) should be rinsed and staged with the recovery drum(s) for disposal.

8.5.4.2 Dry Solid Spills

Spills of dry solids shall be cleaned up by placing the spilled material into the same drum or, if damaged, into a recovery drum. The recovery drum used shall then be sealed and appropriately labeled. The information that shall be identified on the label includes the storage date, source of the material, and other applicable information.

8.2 JOINT CONDITION SURVEY

Before initiation of field activities, WESTON and CEAAO shall jointly undertake a condition survey of the vaults, adjacent work areas, assigned storage areas, and access routes. The survey shall be accomplished by conducting a site walkover to verify the locations of the vaults and other features. Adjacent properties shall also be visually examined to note existing utilities, improvements, etc. Where possible, a videotape of the site shall be taken. Specific items of interest include:

- On-site and immediate off-site drainage patterns shall be noted, especially areas undergoing active erosion/sedimentation.
- Overhead utilities shall be noted.
- Access roads shall be examined for signs of deterioration and wear, such as potholes, muddy stretches, obstructing debris, and clogged drainage ditches.
- Drainage culverts shall be checked for crushed sections and blocked openings, and their location and condition noted.
- Damaged or missing sections of fencing shall be documented.
- The locations of piles of accumulated refuse or other debris within or adjacent to the construction limits shall be noted.
- Any potential sources of groundwater infiltration shall be noted.

8.3 ENVIRONMENTAL PROTECTION

8.3.1 Protection of Land Area

All land areas on-site and outside specifically assigned work areas, storage areas, and access routes shall be preserved in their original condition during the course of construction. Work activities shall be confined to areas defined for work on the plans or assigned for the use of WESTON to facilitate construction. Should the need arise for temporary use of an unassigned area, WESTON shall obtain all of the necessary permits, easements, releases, and other required agreements. At this time, WESTON does not anticipate the need for accessing areas outside the established limits of construction.

Trucks and equipment shall be confined to designated haul and access roads and the project work area. Steps shall be taken to prevent rutting of roads, destruction of culverts, and damage to grassed areas, trees, and shrubs.

8.5.4.3 Spills on Soil

In the event of a spill of material on soil, the cleanup operation shall involve the removal and placement in drums of the material and the adjacent soil down to a level that is visually apparent to be free from contamination. The spill area shall be monitored with real-time air sampling instruments as an indication of "all clear."

A spill on dry soil shall involve the removal of all damp soil and enough dry soil to ensure that the area is free from contamination.

A spill on damp soil shall involve the removal of all spilled material and a minimum of 1 inch of soil below the level of the spilled material.

Sampling during the cleanup operation shall include the following:

- Samples of the spilled material.
- Samples of the soil to be removed.
- Samples of the soil exposed after removal, to ensure proper cleanup.

8.5.4.4 Spills on Concrete or Within a Contained Area

In the event of a spill of material on concrete, the cleanup operation shall involve the removal and placement in drums of the spilled material.

A liquid spill shall involve the removal and placement in drums of all spilled material and absorbents used to complete the cleanup operation. The concrete shall be cleaned using a solution of Alconox worked over the area with stiff-bristle brushes and wiped up using mops and buckets. All cleanup liquid used shall be drummed, sealed, and labeled for disposal in accordance with the procedures specified in the SSWP.

A dry solid spill on concrete shall involve removal and placement in drums of all spilled materials. The concrete shall be cleaned using a solution of Alconox worked over the area with stiff-bristle brushes and wiped up using mops and buckets. All cleanup liquid used shall be drummed, sealed, and labeled for disposal.

Sampling during the cleanup operation shall include the following:

- Samples of the spilled material.
- Samples of the liquid used during cleanup.

- Construction of runon/runoff control measures conforming to the USACE Safety and Health Requirements Manual shall be placed around fuel/material storage locations.

- Assigning designated storage areas for equipment, fuel, oil, and other similar materials required for field activities.

- Using silt fences, where necessary, to filter sediment-laden, high-turbidity runoff prior to its drainage into surface waters adjacent to the work areas.

Soil erosion and sediment control structures, if required, shall be inspected by WESTON weekly and after each significant rainfall, and shall conform to State of Maryland guidelines. The following items shall be checked in particular:

- Silt fencing shall be checked regularly for damage and/or deterioration.

- Perimeter dikes and swales shall be checked for deterioration and any obstructions that could prevent normal positive flow.

- Dikes, if any, shall be checked for stability and integrity, and repaired, if necessary.

8.4 CONTAMINATION CONTROL MEASURES PLAN (CCMP)

8.4.1 Introduction

As part of WESTON's contract with CEAAO for environmental services at APG, a CCMP has been developed.

This plan has been developed to provide the means for preventing, minimizing, controlling, and containing spills and discharges while performing the removal actions at APG.

8.4.2 Approach

The approach of the CCMP is to prepare a set of procedures to be used in conjunction with the SHERP and WMP for the control of migrating contaminants resulting from site activities.

This plan focuses on the minimization of contaminant generation resulting from implementation of field activities and on the containment of those contaminants. There are two primary areas in which contaminant generation could occur, i.e., airborne contamination of potentially toxic vapors, and spills or discharges.

Table 8-1

On-Site Spill and Discharge Control Equipment/Materials

The following equipment and materials shall be maintained in a continual state of readiness at the site during remediation work activities to respond to spills, discharges, and other emergency incidents:

- Telephones (two)
- Two-way radios/mobile telephones (as allowable)
- Horn
- Fire extinguisher
- Absorbent pillows
- Shovel
- Heavy plastic sheeting
- Broom
- Household-strength bleach — four 1-gallon containers
- Hard hat with shield
- Safety glasses/goggles
- Miscellaneous handtools
- Two 55-gallon drums
- One 85-gallon drum
- Eyewash
- First-aid kit

8.5.4.5 Consolidation

In the event of bulk waste spills, tractor trucks, rolloffs, and possibly containers shall be used to consolidate the spilled material and to expedite the cleanup operation. Collection of spent containment structures, drummed spilled material, drummed contaminated soil, drummed contaminated absorbents, and drummed cleaning materials shall be consolidated in an approved, predetermined, central staging area or nearest available site-specific staging area to await disposal in accordance with the WMP.

8.6 POST-REMOVAL ACTION CLEANUP

WESTON shall maintain a clean, unobstructed working environment at all times. No tools, equipment, staging materials, or rubbish shall remain on-site following completion of work activities.

No litter or refuse shall remain after project completion. A site walkover shall be conducted by WESTON and CEAAO personnel after project closeout to detect and remove any litter remaining on-site. Good housekeeping practices during construction activities shall minimize post-removal action cleanup.