FINAL

SITE SAFETY AND HEALTH PLAN ADDENDUM NO. 1

FOR THE

PHASE I REMEDIAL INVESTIGATION OF THE ERIE BURNING GROUNDS AT THE RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO

Prepared for

US Army Corps of Engineers®

Louisville District
Contract No. DACA-62-94-D-0029
Delivery Order No. 0072

July 1999

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APPROVALS

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OF THE
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AT THE
RAVENNA ARMY AMMUNITION PLANT,
RAVENNA, OHIO

Stephen B. Selecman, SAIC Project Manager — Date: 7/20/99

Stephen L. Davis, CIH, CSP, SAIC Health and Safety Manager — Date: 7/20/99

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Prepared by

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CONTENTS

TABLES

ACRONYMS

AOC	area of concern
EBG	Erie Burning Grounds
EOD	explosives ordnance disposal
FSHP	Facility-wide Safety and Health Plan
H&S	Health and Safety
HAZWOPER	Hazardous Waste Site Operations
OE	ordnance and explosives
PID	photoionization detector
PPE	personal protective equipment
PVC	polyvinyl chloride
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
RVAAP	Ravenna Army Ammunition Plant
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TNT	2.4.6-trinitrotoluene
USACE	U.S. Army Corps of Engineers

INTRODUCTION

Science Applications International Corporation's (SAIC's) formal policy, stated in the Environmental Compliance and Health and Safety Program manual, is to take every reasonable precaution to protect the health and safety of our employees, the public, and the environment. To this end, the Ravenna Army Ammunition Plant Facility-wide Safety and Health Plan (FSHP) and this Site Safety and Health Plan (SSHP) Addendum collectively set forth the specific procedures required to protect SAIC and SAIC subcontractor personnel involved in the field activities. All field personnel are required to comply with the requirements of these plans. In addition, subcontractors are responsible for providing their employees with a safe work place and nothing in these plans relieves such subcontractors of this responsibility. If the requirements of these plans are not sufficient to protect the employees of a subcontractor, that subcontractor is required to supplement this information with work practices and procedures that will ensure the safety of its personnel.

The FSHP addresses program issues and hazards and hazard controls common to the entire installation. This SSHP Addendum to the FSHP serves as the lower tier document addressing the hazards and controls specific to the Phase I Remedial Investigation at Erie Burning Grounds (EBG). Copies of the FSHP and this SSHP Addendum will be present at the work site.

SAIC will perform field investigations at the former EBG. This area has been used for the open burning of a variety of materials, including munitions and wastes from munitions loading and demilitarization. Records indicate that the primary materials disposed at this site were 2,4,6-trinitrotoluene (TNT) and propellant. Potential contaminants of concern include ordnance and explosives (OE), explosives residues (i.e., TNT), semivolatile organic compounds, and metals.

The following tasks are to be performed as part of this project:

- soil sampling with hand augers and hand-operated power augers on the railroad embankment, gravel access road, burning areas between the "T-Area" ditches, borrow area, and other locations as necessary;

- vegetation clearing with machetes and chainsaws;

- surface water and sediment sampling using hand tools while wading in former burning areas (under 1 to 3 feet of water) adjacent to railroad embankment and gravel access road, and other locations as needed;

- surface water and sediment sampling using hand tools while wading (areas under 1 to 3 feet of water) in the former "T-Area" ditches, four surface water basins, stream immediately north and south of EBG, the stream where it exits facility, and other locations as necessary; and

- sampling equipment decontamination.

Potential hazards posed by the tasks planned at these locations include OE, clearing vegetation, moving equipment, operating soil sampling equipment (power auger), fuel or decontamination solvent fires, chemical exposure, temperature extremes, noise, stinging/biting insects, poisonous plants, and snakes. Slips, trips, and falls are particularly relevant hazards while sampling in flooded areas where footing may be poor. Personal flotation devices will be required for sampling within inundated areas.

The potential for chemical overexposure appears to be very low given the nature of planned tasks. All of the potential contaminants have low vapor pressures, making overexposure through vapor inhalation very unlikely. All of the planned tasks pose minimal potential for creating airborne particulate. There is some potential for adverse effects due to dermal contact with contaminated soil. The crew will use protective gloves to handle potentially contaminated materials and, if necessary, the Site Safety and Health Officer (SSHO) will upgrade the required personal protective equipment (PPE) to prevent dermal contact with potentially contaminated materials. Physical hazards are associated with power auger and chainsaw use. Task-specific hazard controls have been specified for these tasks. The SSHO will observe all site tasks during daily safety inspections and will use professional judgement, potentially coupled with instrument readings, to determine if upgrading PPE is required. A detailed analysis of these hazards and specific appropriate controls is presented in Section 2.0, Table 2-2.

This investigation will be performed in Level D PPE, plus chemical-resistant gloves when handling potentially contaminated materials, unless one of several action levels is exceeded or the potential for increased risk becomes apparent during the investigation. Protective procedures, including protective clothing, will be upgraded as necessary by the SSHO based on established action levels or judgment.

1.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.1 SITE DESCRIPTION

Ravenna Army Ammunition Plant (RVAAP) is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 km (3 miles) northeast of the Town of Ravenna. The installation consists of 8668 ha (21,419 acres) in a 17.7-km (11-mile) long, 5.6-km (3.5-mile) wide tract bordered by a sparsely inhabited private residential area. The site is an inactive government-owned armament, munitions, and chemical command facility maintained by a contracted caretaker, R&R International, Inc.

The installation was active from 1941 to 1992. Activities included loading, assembling, storing, and packing military ammunition; demilitarization of munitions; production of ammonium nitrate fertilizer; and disposal of "off-spec" munitions. Munitions handled on the installation included artillery rounds of 90 mm or more and 2000-lb bombs.

Erie Burning Grounds (EBG) is a 14-ha (35-acre) area that was used for open burning of explosives [hexahydro-1,3,5-trinitro,-1,3,5-triazine (RDX); 2,4,6-trinitrotoluene (TNT); and propellant], and related materials. The area of concern (AOC) is on Blackberry Lane north of Area 7. The area was used for disposal from approximately 1941 to 1951. Metal items were also treated to remove explosives residue, then removed for processing as scrap. The ash residue from burning was left on the AOC. Much of the AOC is under 1 to 3 feet of water and is significantly vegetated. The area covered by water is reported to be solid, with minimal sediment accumulation. Visual observation of the AOC does not reveal any indication of stressed vegetation, discolored water, or other obvious indications of contamination. Human activities at this site since the 1950s have largely been limited. For additional AOC information, see the Sampling and Analysis Plan (SAP) Addendum.

1.2 CONTAMINANTS

Table 1-1 lists contaminants known to occur in sediment and surface water at the former EBG (USACHPPM 1996). Inclusion in this table indicates the potential presence of a contaminant but does not necessarily indicate that the contaminant is present in sufficient quantity to pose a health risk to workers. Analyses of soils at EBG have included only TNT and RDX, neither of which were detected (Mogul Corp 1982). Additional surface water quality data have been collected at a location near the RVAAP boundary (USATHAMA 1980–1992); however, these data are not thought to represent conditions within EBG at present (see Section 1.0 of the SAP Addendum).

Table 1-1. Potential Contaminants at EBG

Contaminant	Maximum Reported Concentration	
Arsenic	4 µg/L in surface water	9.94 mg/kg in sediment
Barium	29 µg/L in surface water	113 mg/kg in sediment
Chromium	Less than detection in surface water	18.6 mg/kg in sediment
Copper	29 µg/L in surface water	32.8 mg/kg in sediment
Lead	16 µg/L in surface water	Less than detection in sediment
Zinc	Less than detection in surface water	217 mg/kg in sediment
Explosives: TNT RDX[a]	 Less than detection in surface water 64 µg/L at PF 534	 Less than detection in soil
Propellants[b]	Unknown	Unknown
VOCs[b]	Unknown	Unknown
SVOCs[b]	Unknown	Unknown

[a]Reanalysis of the sample showed a result of <0.25 µg/L.
[b]No data exist for this class of compounds.

2.0 HAZARD/RISK ANALYSIS

The purpose of the task hazard/risk analysis is to identify and assess potential hazards that may be encountered by personnel and to prescribe required controls. Table 2-1, a general checklist of hazards that may be posed by this project, indicates whether a particular major type of hazard is present. If additional tasks or significant hazards are identified during the work, this document will be modified by addendum or field change order to include the additional information.

Table 2-1. Hazards Inventory

Yes	No	Hazard
	X	Confined space entry
	X	Excavation entry (deeper than 1.2 m)
X		Heavy equipment (power augers)
X		Fire and explosion (fuels)
	X	Electrical shock (utilities)
X		Exposure to chemicals
X		Temperature extremes
X		Biological hazards
	X	Radiation or radioactive contamination
X		Noise (power auger)
X		Drowning
X		OE

Specific tasks are as follows:

- OE surveys and sample location clearance;
- vegetation clearing with machete and chainsaw;
- surface soil sampling in the non-inundated areas with hand augers or scoops;
- subsurface soil boring and sampling with power augers in the non-inundated areas;
- surface water and sediment sampling in inundated areas using hand tools while wading;
- equipment decontamination at the central equipment decontamination facility; and
- characterization and handling of investigative-derived wastes.

2.1 TASK-SPECIFIC HAZARD ANALYSIS

Table 2-2 presents task-specific hazards, task-specific hazard analyses (Risk Assessment Code), relevant hazard controls, and required monitoring, if appropriate, for all of the planned tasks. The Risk Assessment Codes in Table 2-2 are derived through a qualitative risk assessment process using probability codes and severity codes. The severity codes are:

- I = injuries/illnesses involving permanent total disability or death;

- II = injuries/illnesses with permanent partial disability or temporary total disability;

- III = injuries/illnesses resulting in temporary, reversible conditions with period of disability of less than 3 months; and

- IV = injuries/illnesses with reversible adverse effects requiring only minor treatment.

The probability codes are:

- A = likely to occur immediately;
- B = probably will occur in time;
- C = possible to occur in time; and
- D = unlikely to occur.

2.2 POTENTIAL EXPOSURES

Prior sampling results indicate that contamination, if present, is at relatively low concentrations. As a precaution, steps will be taken to minimize the potential for exposure. Information on the potential contaminants and chemicals that will be used for the project is contained in Table 2-3. It is important to note that the contaminants listed in Table 2-3 have been detected in a number of locations at RVAAP and might be expected to occur at any ordnance disposal area. However, as noted above, prior sampling at this location indicated that these contaminants, if present, are present at very low concentrations, and significant exposure to site contaminants appears unlikely based on available data. Exposure to chemical tools such as corrosive sample preservatives or flammable fuels is a possibility and will be controlled through standard safe handling practices.

Table 2-2. Hazards Analysis

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Vegetation Clearing with Machetes and Chainsaws			
General safety hazards (rotating machinery, moving equipment, slips, falls)	B, II	Level D PPE (see Section 5.0) plus hardhat, heavy-duty work gloves, chainsaw chaps. Uninvolved personnel will be kept at a distance of at least 50 feet. An audible warning will be used to alert personnel when a tree is falling. No elevated (climbing trees, standing on ladders, etc.) chainsaw use. Only personnel experienced with chainsaw use will operate saws. Team members will be at least 10 feet apart but within visual contact during cutting. Chainsaw equipped with anti-kickback protection. Chainsaw adjusted so that chain does not move at idle speed. Chainsaw will not be used to cut above shoulder height. Machetes equipped with lanyard and lanyard looped around wrist during use to prevent accidental release of machete.	Daily safety inspections.
Contact with OE	C, II	Pre-entry screening survey and continuous escort by OE specialist support. On-site training in ordnance recognition for all field personnel. Withdrawal of all SAIC and subcontractor personnel from immediate area and field marking of suspect area if ordnance or suspected ordnance is discovered. Notification of USACE Project Manager and facility EOD personnel if ordnance is discovered.	Visual and instrument surveys for ordnance conducted by OE expert personnel.
Exposure to chemicals (see Table 2-3)	D, IV	No contact with potentially contaminated material is expected during this task. As a precaution, hands will be washed prior to taking anything by mouth. Medical clearance will be required.	Daily safety inspections.
Gunfire (deer hunting with shotguns loaded with slugs is allowed in some areas on Friday and Saturday during season, October and November)	D, I	No fieldwork during hunting season.	None.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Noise	B, II	Hearing protection while operating or within 25 feet of operating chainsaw.	Daily safety inspections.
Fire (fuels)	D, III	Chainsaw turned off and allowed to cool for 5 minutes prior to fueling. Fuel in safety cans with flame arrestors. No ignition sources in fuel storage or refueling areas. Fire extinguisher (see Section 9.0).	Daily safety inspections.
Biological hazards (bees, ticks, wasps, snakes, poison ivy)	C, III	PPE (boots, work clothes). Pants tucked into boots or wrapped with duct tape. Insect repellant, as necessary.	Visual survey.
Electric shock	D, II	None expected. SSHO will verify.	Visual survey of all work areas.
Temperature extremes	C, II	Administrative controls (see Section 8.0).	Ambient temperature, heart rates as appropriate.
Soil Boring and Soil Sampling Using a Hand-Operated Power Auger			
General safety hazards (rotating machinery, moving equipment, slips, falls)	C, II	Level D PPE (see Section 5.0) plus hardhat. Operate auger per manufacturer's directions. Positive action control (Deadman switch) or easily accessible kill switch on power auger. HAZWOPER training. Buddy system.	Daily safety inspections.
Contact with OE	C, II	Pre-entry screening survey and continuous escort by OE specialist support. Continuous down-hole monitoring at 2-foot intervals. On-site training in ordnance recognition for all field personnel. Withdrawal of all SAIC and subcontractor personnel from immediate area and field marking of suspect area if ordnance or suspected ordnance is discovered. Notification of USACE Project Manager and facility EOD personnel if ordnance is discovered.	Visual and instrument surveys for ordnance conducted by OE expert personnel.
Exposure to chemicals (see Table 2-3)	D, IV	Natural rubber or similar gloves for contact with potentially contaminated material. Gloves will be disposed after single use. 15-minute eyewash within 100 feet if corrosive sample preservatives are being poured. Washing face and hands and any other exposed areas prior to taking anything by mouth. Minimal contact. Medical clearance will be required.	Visual surveillance for dust generation, visual surveillance for significant contamination.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Gunfire (deer hunting with shotguns loaded with slugs is allowed in some areas on Friday and Saturday during season, October and November)	D, I	No fieldwork during hunting season.	None.
Noise	B, II	Hearing protection within 7.6 m (25 feet) of equipment when operating.	Daily safety inspections.
Fire (fuels)	D, III	Fuel in safety cans with flame arrestors. No ignition sources in fuel storage or refueling areas. Fire extinguisher (see Section 9.0).	Daily safety inspections.
Animal hazards (bees, ticks, wasps, snakes)	C, III	PPE (boots, work clothes). Pants tucked into boots or wrapped with duct tape. Insect repellant, as necessary.	Visual survey.
Electric shock	D, II	Identification and clearance of underground utilities.	Visual survey of all work areas.
Temperature extremes	C, II	Administrative controls (see Section 8.0).	Ambient temperature, heart rates as appropriate.
Soil Sampling with Hand Augers or Scoops			
General safety hazards (manual lifting, slips, falls)	D, IV	Level D PPE (see Section 5.0). HAZWOPER training. Buddy system.	Daily site safety inspections.
Contact with OE	C, II	Pre-entry screening survey, sample location clearing, and continuous escort by OE specialist support. On-site training in ordnance recognition for all field personnel. Withdrawal of all SAIC and subcontractor personnel from immediate area and field marking of suspect area if ordnance or suspected ordnance is discovered. Notification of USACE Project Manager and facility EOD personnel if ordnance is discovered.	Visual and instrument surveys for ordnance.
Exposure to chemicals (see Table 2-3)	D, III	Natural rubber or similar gloves for contact with potentially contaminated material. Gloves will be disposed after single use. Washing face and hands and any other exposed areas prior to taking anything by mouth. Minimal contact. 15-minute eyewash within 100 feet if corrosive sample preservatives are being poured. Medical clearance will be required.	Photoionization detector, visual surveillance for significant contamination.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Gunfire (deer hunting with shotguns loaded with slugs allowed in some areas on Friday and Saturday during season, October and November)	D, I	No field work during hunting season.	None.
Animal hazards (bees, ticks, wasps, snakes)	C, III	PPE (boots, work clothes). Pants tucked into boots or wrapped with duct tape. Insect repellant, as necessary.	Visual survey.
Temperature extremes	C, II	Administrative controls (see Section 8.0).	Ambient temperature, heart rates as appropriate.
Sediment and Surface Water Sampling in Inundated Areas			
General safety hazards (moving equipment, slips, falls)	D, IV	Level D PPE (see Section 5.0). HAZWOPER training. Buddy system.	Daily safety inspections.
Drowning	C, II	Personal flotation devices must be worn if within 1.5 m (5 feet) of water deeper than 1.2 m (4 feet).	Daily safety inspections.
Exposure to chemicals (see Table 2-3)	D, III	Natural rubber or similar gloves for contact with potentially contaminated material. Washing face and hands and any other exposed areas prior to taking anything by mouth. Gloves will be disposed after a single use. Boots or waders will be dedicated to work in potentially contaminated areas and will be deconned following each use or bagged pending subsequent use. Minimal contact. 15-minute eye wash within 100 feet if corrosive sample preservatives are being poured. Medical clearance will be required.	Daily safety inspections.
Gunfire (deer hunting with shotguns loaded with slugs is allowed in some areas on Friday and Saturday during season, October and November)	D, I	No field work during hunting season.	None.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Contact with OE	D, II	Initial screening survey, sample location clearing, and continuous escort by OE expert personnel. On-site training in ordnance recognition for all field personnel. Visual surveillance for OE. Withdrawal of all SAIC and subcontractor personnel and field marking of the area if ordnance or suspected ordnance is discovered. Notification of USACE Project Manager and facility EOD personnel if ordnance is discovered.	Visual and instrument surveys for ordnance
Animal hazards (bees, ticks, wasps, snakes)	C, III	PPE (boots, work clothes). Pants tucked into boots or wrapped with duct tape. Insect repellant, as necessary. Snake chaps if moving through underbrush.	Visual survey.
Temperature extremes	C, III	Administrative controls (see Section 8.0).	Ambient temperature, heart rates as appropriate.
Disposal of Investigation-Derived Wastes (Soil Cuttings and Decontamination Rinsates)			
General safety hazards (power machinery, moving equipment, slips, falls)	D, III	Level D PPE (see Section 5.0) plus heavy duty work gloves. Hardhat if overhead hazards are present. Personnel not involved with equipment (trailer-mounted liquid tank, manual drum truck, drum grappler, Tommy lift, etc.) will stand clear during operation. HAZWOPER training. Buddy system. No personnel under lifted loads. Only adequately trained, experienced personnel will be allowed to operate equipment. Equipment used to lift or move drums will be used within its rated weight capacity.	Daily safety inspections.
Contact with OE	D, II	On-site training in ordnance recognition for all field personnel. Visual surveillance for OE. Withdrawal of all SAIC and subcontractor personnel and field marking of the area if ordnance or suspected ordnance is discovered. Notification of USACE Project Manager and facility EOD personnel if ordnance is discovered.	Visual surveys for ordnance.
Exposure to chemicals (see Table 2-3)	D, III	Natural rubber or similar gloves for contact with potentially contaminated material. Washing face and hands and any other exposed areas prior to taking anything by mouth. Minimal contact. Medical clearance will be required.	Daily safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Gunfire (deer hunting with shotguns loaded with slugs allowed in some areas on Friday and Saturday during season, October and November)	D, I	No field work during hunting season.	None.
Fire (fuels)	D, III	Fuel in safety cans. Exclude ignition sources from fuel storage and refueling areas. Fire extinguisher (see Section 9.0).	Daily safety inspections.
Animal hazards (bees, ticks, wasps, snakes)	C, III	PPE (boots, work clothes). Pants tucked into boots or wrapped with duct tape. Insect repellant, as necessary.	Visual survey.
Temperature extremes	C, II	Administrative controls (see Section 8.0).	Ambient temperature, heart rates as appropriate.
Equipment Decontamination (Hot Water Washing, Soap and Water Washing, Solvent Rinse)			
General equipment decontamination hazards (hot water, slips, falls, equipment handling)	C, III	Level D+ PPE (see Section 5.0) plus: Nitrile or PVC gloves, face shield, and Saranax or rain suit (when operating steam washer). HAZWOPER training.	Daily safety inspections.
Noise (spray washer)	B, II	Hearing protection when within 7.6 m (25 feet) of operating washer.	Daily safety inspections.
Fire (flammable decontamination solvents and gasoline)	D, III	Exclusion of ignition sources during solvent use. Control of flammable materials (quantities in decontamination area limited to single day use, proper storage). Fire extinguisher (see Section 9.0).	Daily safety inspections.
Exposure to chemicals (see Table 2-3)	D, III	Natural rubber or similar gloves for handling potentially contaminated materials. Adequate ventilation during solvent use. Washing face and hands and any other exposed areas prior to taking anything by mouth. Minimal contact. Medical clearance will be required.	None.

Table 2-2 (continued)

Safety and Health Hazards	Risk Assess. Codes	Controls	Monitoring
Temperature extremes	C, II	Administrative controls (see Section 8.0).	Temperature measurements as appropriate, heart rate monitoring as appropriate.

EOD = Explosives ordnance disposal
HAZWOPER = Hazardous Waste Site Operations
PPE = Personal protective equipment
PVC = Polyvinyl chloride
SAIC = Science Applications International Corporation
SSHO = Site Safety and Health Officer
USACE = U.S. Army Corps of Engineers
OE = Ordnance and explosives

Table 2-3. Potential Exposures for the Phase I RI at EBG

Chemical[a]	TLV/PEL/STEL/IDLH[b]	Health Effects/ Potential Hazards[c]	Chemical and Physical Properties[c]	Exposure Route(s)[c]	Location
Chromium	TLV/TWA: 0.5 mg/m^3, A4 IDLH: 25 mg/m^3	Eye irritation, sensitization	Solid; properties vary depending upon specific compound	Inhalation Ingestion Contact	EBG
DNT (dinitrotoluene)	TLV/TWA: 0.2 mg/m^3, A2 IDLH: Ca [50 mg/m^3]	Suspected human carcinogen, anorexia, cyanosis, reproductive effects	Orange-yellow solid, VP: 1 mm; FP: 404EF	Inhalation Absorption Ingestion Contact	EBG
Gasoline (used for fuel)	TLV/TWA: 300 ppm IDLH: Ca	Potential carcinogen per NIOSH, dizziness, eye irritation, dermatitis	Liquid with aromatic odor; FP: -45EF; VP: 38-300 mm	Inhalation Ingestion Absorption Contact	All
Hydrochloric acid (potentially used to preserve water samples or for equipment decontamination)	TLV: 5 ppm ceiling IDLH: 50 ppm	Irritation of eyes, skin, respiratory system	Liquid; VP: fuming; IP: 12.74 eV; FP: none	Inhalation Ingestion Contact	Equipment decontamination area
Isopropyl alcohol (potentially used for equipment decontamination)	TLV/TWA: 400 ppm STEL: 500 ppm IDLH: 2000 ppm	Irritation of eyes, skin, respiratory system; drowsiness, headache	Colorless liquid with alcohol odor; VP: 33 mm; IP: 10.10 eV; FP: 53EF	Inhalation Ingestion Contact	Equipment decontamination area
Lead	TLV/TWA: 0.05 mg/m^3, A3 PEL/TWA: 0.05 mg/m^3 IDLH: 100 mg/m^3	Weakness, anorexia, abdominal pain, anemia	Solid metal; VP: 0 mm; FP: NA; IP: NA	Inhalation Ingestion Contact	EBG
Liquinox (used for decontamination)	TLV/TWA: None	Inhalation may cause local irritation to mucus membranes	Yellow odorless liquid (biodegradable cleaner); FP: NA	Inhalation Ingestion	Equipment decontamination area
Methanol (potentially used for equipment decontamination)	TLV/TWA: 200 ppm Skin notation IDLH: 6000 ppm	Irritation of eyes, skin, respiratory system; headache; optic nerve damage	Liquid; VP: 96 mm; IP: 10.84 eV; FP: 52EF	Inhalation Absorption Ingestion Contact	Equipment decontamination area

Table 2-3 (continued)

Chemical[a]	TLV/PEL/STEL/IDLH[b]	Health Effects/ Potential Hazards[c]	Chemical and Physical Properties[c]	Exposure Route(s)[c]	Location
HMX (octogen)	TLV/TWA: None established, toxicity assumed to be similar to RDX as compounds are very similar	Explosive; assumed irritation of eyes and skin, dizziness, weakness	Assumed similar to RDX- FP: explodes; VP: 0.0004 mm at 230EF	Assumed: Inhalation Absorption Ingestion Contact	EBG
RDX (cyclonite)	TLV/TWA: 0.5 mg/m^3, A4 Skin notation IDLH: none established	Explosive; irritation of eyes and skin, dizziness, weakness	White powder; FP: explodes; VP: 0.0004 mm at 230EF	Inhalation Absorption Ingestion Contact	EBG
TNT	TLV/TWA: 0.5 mg/m^3 Skin notation IDLH: 500 mg/m^3	Cluster headache; irritation of skin and mucus membranes, liver damage, kidney damage	Pale solid; FP: explodes; VP: 0.0002 mm	Inhalation Absorption Ingestion Contact	EBG

[a]The potential chemicals were obtained from the *Ravenna Army Ammunition Plant Phase I Remedial Investigation Report* (SAIC 1997).
[b]From 1999 Threshold Limit Values, *NIOSH Pocket Guide to Chemical Hazards*, 1997.
[c]From 1997 *NIOSH Pocket Guide to Chemical Hazards, the Condensed Chemical Dictionary*, Tenth Edition.

A2 = suspected human carcinogen
A3 = confirmed animal carcinogen with unknown relevance to humans
A4 = Not Classifiable as a human carcinogen
IP = ionization potential
FP = flash point
PEL = permissible exposure limit
TWA = time-weighted average
IDLH = immediately dangerous to life and health
STEL = short-term exposure limit
VP = vapor pressure
EBG = Erie Burning Grounds
TLV = threshold limit value
NA = not available
NIOSH = National Institute for Occupational Safety and Health

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3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

This section presents the personnel (and their associated telephone numbers) responsible for site safety and health and emergency response. Table 3-1 identifies the Science Applications International Corporation (SAIC) and subcontractor individuals who will fill key roles. See the Facility-wide Safety and Health Plan (FSHP) for information on the roles and responsibilities of key positions.

Table 3-1. Staff Organization

Position	Name	Phone
Program Manager (DACA62-94-D-0029)	Ike Diggs	423-481-8710
Health and Safety Manager	Steve Davis CIH, CSP	423-481-4755
Project Manager	Stephen Selecman	423-481-8761
Technical Manager	Kevin Jago	423-481-4614
Field Operations Manager	Kathryn Dominic	937-431-2220
Site Safety and Health Officer	Martha Clough	937-431-2220

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4.0 TRAINING

Training requirements are outlined in the FSHP. In addition to the FSHP's requirements, at least two first aid/CPR trained personnel must be onsite during field activities.

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5.0 PERSONAL PROTECTIVE EQUIPMENT

General guidelines for selection and use of personal protection equipment (PPE) are presented in the FSHP. Specific PPE requirements for the Phase I Remedial Investigation (RI) at EBG are presented in the hazard/risk analysis section (Section 2.0).

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6.0 MEDICAL SURVEILLANCE

Medical surveillance requirements are presented in the FSHP.

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7.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Assessment of airborne chemical concentrations will be performed, as appropriate, to ensure that exposures do not exceed acceptable levels. Action levels, with appropriate actions, have been established for this monitoring. In addition to the specified monitoring, the Site Safety and Health Officer (SSHO) may perform, or require, additional monitoring such as organic vapor monitoring in the equipment decontamination area, personnel exposure sampling for specific chemicals, etc. The deployment of monitoring equipment will depend on the activities being conducted and the potential exposures. All personal exposure monitoring records will be maintained in accordance with 29 *CFR* 1910.20. The minimum monitoring requirements and action levels are presented in Table 7-1.

Most of the Phase I RI field work is not expected to pose airborne exposure hazards for the following reasons:

- most of the site is covered by water;
- the work will be performed in open areas with natural ventilation;
- the site has not been used for over forty years and any volatile contaminants should have evaporated;
- prior site sampling indicated that contaminants are unlikely to pose an airborne hazard; and
- the most probable contaminants (heavy metals and explosives residues) are materials with relatively low vapor pressures.

For these reasons, air monitoring using a photoionization detector (PID) or equivalent is planned only for subsurface soil boring and sampling. The SSHO will, of course, examine site conditions and will contact the Health and Safety Manager and initiate additional monitoring if there is any indication of potential airborne exposure.

Table 7-1. Monitoring Requirements and Action Limits

Hazard or Measured Parameter	Area	Interval	Limit	Action	Tasks
Airborne organics with PID or equivalent	Breathing zone [0.9 m (3 ft) from source or 0.36 m (14 in.)] in front of employee's shoulder	One to three feet below ground surface and if site conditions, such as discolored soil or chemical smells, indicate monitoring to be necessary	<5 ppm >5 ppm	Level D Withdraw and evaluate • identify contaminants • notify Project Manager and H&S Manager	Subsurface soil sampling or as indicated by site conditions
Detector tubes	Breathing zone	Only if PID monitoring is conducted and indicates organic vapor >5 ppm	PEL/TLV	Withdraw and evaluate, controls may include engineering, administrative, or personal protective measures	None, unless indicated by site conditions
Flammability and oxygen content with combustible gas indicator	Near borehole and any area where flammable gases are suspected	Only if PID monitoring is conducted and readings exceed 100 ppm or other indicators of flammability observed	<10% LEL >10% LEL	Continue and evaluate source Withdraw and allow area to ventilate; notify Project Manager and H&S Manager	None, unless indicated by site conditions
Noise	All	During operation of power augers and any area where there is some doubt about noise levels	85 dBA and any area perceived as noisy	Require the use of hearing protection	Hearing protection will be worn within the exclusion zone around power augers or other motorized equipment
Visible contamination	All	Continuously	Visible contamination of skin or personal clothing	Upgrade PPE to preclude contact; may include disposable coveralls, boot covers, etc.	All

Table 7-1 (continued)

Hazard or Measured Parameter	Area	Interval	Limit	Action	Tasks
Visible airborne dust	All	Continuously	Visible dust generation	Stop work; use dust suppression techniques such as wetting surface	All

H&S = Health and Safety
LEL = Lower explosive limit
PEL = Permissible exposure limit
PID = Photoionization detector
PPE = Personal protective equipment
TLV = Threshold limit value

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8.0 HEAT/COLD STRESS MONITORING

General requirements for heat/cold stress monitoring are contained in the FSHP.

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9.0 STANDARD OPERATING SAFETY PROCEDURES

Standard operating safety procedures are described in the FSHP.

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10.0 SITE CONTROL MEASURES

Site control measures are described in the FSHP. No formal site control is expected to be necessary for the Phase I RI at EBG as the site is remote and not frequently accessed. Should conditions require site control, it will be established as described in the FSHP.

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11.0 PERSONNEL HYGIENE AND DECONTAMINATION

Personal hygiene and decontamination requirements are described in the FSHP and in Section 2.0 of this addendum.

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12.0 EQUIPMENT DECONTAMINATION

Equipment decontamination procedures are described in the FSHP.

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13.0 EMERGENCY PROCEDURES AND EQUIPMENT

Emergency contacts, telephone numbers, directions to the nearest medical facility, and general procedures can be found in the FSHP. The SAIC Field Operations Manager will remain in charge of all SAIC and subcontractor personnel during emergency activities. The SAIC field office will serve as the assembly point if it becomes necessary to evacuate one or more sampling locations. The SSHO will verify that the emergency information in the FSHP is correct during mobilization.

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14.0 LOGS, REPORTS, AND RECORD KEEPING

Logs, reports, and record keeping requirements are described in the FSHP.

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15.0 REFERENCES

Mogul Corporation. 1982. *Soil and Sediment Analysis Performed for Ravenna Arsenal, Ravenna, Ohio*.

NIOSH (National Institute for Occupational Safety and Health) 1997. *NIOSH Pocket Guide to Chemical Hazards, the Condensed Chemical Dictionary, 10th Edition*.

SAIC (Science Applications International Corporation) 1997. *Ravenna Army Ammunition Plant Phase I Remedial Investigation*.

USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine) 1996. *Relative Risk Site Evaluation, Ravenna Army Ammunition Plant, 28 October–1 November 1996*. Hazardous and Medical Waste Study No. 37-EF-5360-97.

USATHAMA (U.S. Army Toxic and Hazardous Materials Agency) 1980-1992. Ravenna Army Ammunition Plant Water Quality Surveillance Program (data only).

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