

FINAL

**FACILITY-WIDE
SAFETY AND HEALTH PLAN**

FOR

ENVIRONMENTAL INVESTIGATIONS

AT THE

**RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO**

Prepared for



**US Army Corps
of Engineers®**

**U.S. Army Corps of Engineers – Louisville District
Contract No. DACA 62-00-D-0001
Delivery Order CY02**

March 2001



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contributed to the preparation of this document and should not
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APPROVALS

**FACILITY-WIDE SAFETY AND HEALTH PLAN
FOR ENVIRONMENTAL INVESTIGATIONS AT THE
RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO**

U.S. Army Program Manager

Date

U.S. Army Health and Safety Manager

Date

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ACRONYMS

AOC	Area of Concern
<i>CFR</i>	<i>Code of Federal Regulations</i>
CIH	Certified Industrial Hygienist
CPR	cardiopulmonary resuscitation
EM	Environmental Management
EOD	explosive ordnance disposal
ESS	Explosives Safety Submission
FP	flash point
FSHP	Facility-wide Safety and Health Plan
GFCI	ground fault circuit interrupter
H&S	Health and Safety
HAZWOPER	Hazardous Waste Site Operations
IDW	investigation derived waste
IP	ionization potential
MSDSs	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
OJT	on-the-job training
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PVC	polyvinyl chloride
RVAAP	Ravenna Army Ammunition Plant
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
UXO	unexploded ordnance
VP	vapor pressure
WBG	wet bulb globe temperature

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INTRODUCTION

This Facility-wide Safety and Health Plan (FSHP) sets forth the minimum requirements for protecting personnel involved in environmental investigations at the Ravenna Army Ammunition Plant (RVAAP). Standard procedures must be used to minimize the potential for personnel injury or illness. These will include on-site training, routine inspections, visual and instrument (as appropriate) surveillance for unexploded ordnance, and enforcement of the health and safety requirements by project management. This plan is organized to follow and address the requirements in Appendix B to ER 385-1-92, "Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities." It is designed to comply with the requirements of Environmental Management (EM) 385-1-1, "U.S. Army Corps of Engineers Safety and Health Requirements Manual," and relevant Occupational Safety and Health Administration (OSHA) regulations. This plan was prepared to provide contractors with guidance on health and safety hazards and controls. Nothing in this document relieves the contractor from the requirement to comply with all applicable portions of the EM 385-1-1 and OSHA regulations, and to provide a safe workplace.

This FSHP is intended to serve as an upper tier document addressing the hazards and controls expected to be common to the investigation of all RVAAP Areas of Concern (AOCs) and the anticipated on-site tasks. A contractor- and investigation-specific Site Safety and Health Plan (SSHP) addendum must be prepared to address the specific hazards and controls relevant to work at each AOC prior to beginning work at that particular AOC. Each addendum must reference the FSHP and Explosive Safety Submission (ESS) for all those items not duplicated in the addendum. Details such as a description of site conditions, maximum anticipated contaminant concentrations, and investigation-specific variations from the FSHP will be presented in these addenda. Work cannot be performed under the FSHP without being accompanied by an investigation-specific SSHP addendum for each AOC. A copy of the FSHP and the appropriate SSHP addendum will be present at each work site.

Anticipated environmental investigation tasks expected to be performed include:

- site visits,
- soil boring and sampling with drill rigs,
- installation of monitoring wells,
- soil boring and sampling with hand augers,
- sediment sampling with hand augers,
- surface water sampling,
- vegetation clearing,
- investigation-derived waste handling,
- soil excavation and sampling with trenching equipment, and
- sampling equipment decontamination.

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1.0 FACILITY 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 facility consists of 8668.3 ha (21,419 acres) in a 17.7-km (11-mile)-long, 5.6-km (3.5-mile)-wide tract bordered by sparsely inhabited private residences. The installation is an inactive government-owned Operations Support Command (OSC) facility maintained by a contracted caretaker, Tol-Test, Inc.

The facility was active from 1941 to 1992. On-site 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-pound bombs. A number of Areas of Concern (AOCs) have currently been identified. A description of each AOC is included in the installation Preliminary Assessment (December 1995), the RVAAP Installation Action Plan (2000), and the Relative Risk Site Evaluation (USACHPPM 1998).

1.2 CONTAMINANTS

The RVAAP AOCs were associated with the assembly, storage, shipment, and/or disposal of a variety of materials including munitions and wastes. The principal munitions assembled on the installation were artillery rounds of 90-mm or more and 2000-pound bombs. Contaminants of concern that are potentially present include explosive compounds (cyclonite, TNT, smokeless powder), propellants, polychlorinated biphenyls, petroleum hydrocarbons, and metals (aluminum, arsenic, barium, cadmium, chromium, lead, manganese, mercury, selenium, silver, and zinc). Contaminants that are potentially present at each AOC must be discussed in an investigation-specific addendum.

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2.0 HAZARD/RISK ANALYSIS

The purpose of the task hazard analysis is to identify and assess potential hazards that may be encountered by personnel and to prescribe required controls. Table 2-1 is a checklist of common hazards that may be posed during the investigation of AOCs. It indicates whether a particular major type of hazard is present. The tasks are expected to consist of clearing vegetation; trenching, collecting surface soil samples, subsurface soil samples, sediment samples, and surface water samples; installing piezometers and monitoring wells; and managing investigation-derived waste (IDW). In general, given these tasks, the potential for unacceptable exposure to contaminants appears to be low. Expected tasks present a variety of physical hazards including unexploded ordnance (UXO), contact with equipment, falls into excavations, engulfment by loose soil in an excavation, noise, and heat/cold stress. The Contractor must include an assessment of project-specific hazards in the Site Safety and Health Plan (SSHP) Addendum.

Table 2-1. Hazards Inventory

Yes	No	Hazard
	X	Confined space entry [Not anticipated. Any confined space entry will require assessment in the SSHP Addendum and compliance with Section 9.4
	X	Excavation entry (Not anticipated. Any excavation entry will require sloping or shoring excavation and compliance with all other applicable requirements)
X		Heavy equipment (drill rigs, backhoes)
X		Potential dangerous tools (brush clearing with chainsaws, machetes, sling blades)
X		Heavy lifting (IDW handling)
X		Fire (fuels)
X		Explosion (unexploded ordnance)
X		Electrical shock (electrical equipment)
X		Exposure to chemicals (site contaminants and chemicals used during site work)
X		Temperature extremes
X		Biological hazards (poison ivy, Lyme disease, Histoplasmosis)
	X	Radiation or radioactive contamination
X		Noise (equipment)

Specific sampling tasks considered in this document are as follows:

- soil and sediment sampling with hand augers or scoops,
- vegetation clearing,
- soil boring and sampling with drill rigs,
- soil excavation and sampling with excavation equipment,
- installation of monitoring wells and groundwater sampling,
- surface water sampling,
- handling IDW, and
- equipment decontamination.

2.1 TASK-SPECIFIC HAZARD ANALYSIS

Table 2-2 presents task-specific hazards, minimum hazard controls, and required monitoring, if appropriate, for all of the planned tasks. This assessment is based on the U.S. Army expectations and some assumptions regarding the planned tasks. It is ultimately the Contractor's responsibility to ensure that the hazards of each task are adequately controlled. In cases where the following controls are not appropriate or sufficient for the specific task(s) to be performed by the Contractor, the Contractor must specify additional appropriate and sufficient controls.

2.2 POTENTIAL EXPOSURES

Information on the significant suspected contaminants and the chemical tools that may be used to investigate all AOCs is provided in Table 2-3. Note that this list includes contaminants known or suspected to occur at any of the AOCs at concentrations sufficient to pose a risk of overexposure. Information on contaminants and chemical tools for work at a specific AOC must be included in each investigation-specific addendum.

Table 2-2. Hazards Analysis

Safety and Health Hazards	Controls	Monitoring
<i>Soil Sampling Using Excavation Equipment</i>		
Safety hazards associated with excavation equipment	Level D PPE including hardhat (see Section 5.0). Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm. Exclusion zone around excavation areas. Only experienced operators will be allowed to operate equipment. Hazardous waste safety training.	Daily safety inspections of operations. Initial and at least weekly inspections of excavation equipment.
Potential excavation cave-in	Personnel will keep at least 0.9 meters (3 feet) distance from excavation edges during excavation. Samples will be collected from outside the excavation by sampling soil in the backhoe bucket or soil from the bottom of the excavation using an auger extension. Prior to sampling from excavations deeper than 1.5 meters (4 feet) deep, excavation edges will be visually examined and approached only at points that are clearly cohesive and show no signs of collapse. If there is any doubt about the safety of the edge, plywood sheeting will be placed over the edge to spread the weight of the person collecting the sample. See Section 9.7.	Daily safety inspections of operations. Examine excavation edge for signs of spalling or collapse.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas.	Daily safety inspection. Combustible gas indicator if buried organic material or other source of flammable gas suspected.
Noise	Hearing protection within 7.6 meters (25 feet) of backhoe or similar equipment unless equipment-specific monitoring indicates exposures less than 90 decibels.	Daily safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Staying upwind of any dust-generating activities. Minimal contact. Hazard communication training. MSDS for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work Decontamination of potentially contaminated equipment prior to servicing.	Photoionization detector or other sampling as appropriate.
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey.
Electric shock	Identification and clearance of overhead and underground utilities.	Visual of all work areas.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0) Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
<i>Soil Boring, Soil Sampling, and Monitoring Well Installation Using Drill Rig; Groundwater Sampling</i>		
General safety hazards (rotating machinery, suspended loads, moving equipment, slips, falls)	Level D PPE (see Section 5.0) plus hard hat. No employees under lifted loads. At least two functional kill switches. Functional back-up alarm. Drill rig manual on site. Only experienced operators. Exclusion zone at least equal to mast height. Hazardous waste safety training.	Daily site safety inspections. Weekly drill rig inspections.
Noise	Hearing protection within 7.6 meters (25 feet) of rig unless rig-specific monitoring indicates noise exposure of less than 90 decibels.	Daily safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Fire (vehicle fuels or subsurface contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas.	Combustible gas indicator if buried organic material or other source of flammable gas is suspected.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Staying upwind of any dust-generating activities. Minimal contact. Hazard communication training. MSDSs for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work. Decontamination of potentially contaminated equipment prior to servicing.	Photoionization detector or other sampling as appropriate.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, Lyme disease, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey.
Electric shock	Identification and clearance of overhead and underground utilities.	Visual of all work areas.
<i>Soil and Sediment Sampling Using Hand Augers or Scoops</i>		
General safety hazards (manual lifting, slips, falls)	Level D PPE (see Section 5.0). Buddy system. Hazardous waste safety training.	Daily site safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Staying upwind of any dust-generating activities. Minimal contact. Hazard communication training. MSDSs for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	Photoionization detector or other sampling as appropriate.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, Lyme disease, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps for work in heavy underbrush during warm weather.	Visual survey.
<i>Surface Water and Sediment Collection From a Boat Using Hand Augers and Hand Tools</i>		
General safety hazards (water safety concerns, slips, trips, falls, equipment handling, boat and motor safety, and weather.	Level D PPE Hazardous waste safety (40 hour) and site-specific training, buddy system, Personal Flotation Devices (PFDs), properly trained personnel to operate boat and motor, and housekeeping.	Daily site safety inspections. Daily boat inspections.
Noise	Hearing protection within 25 feet of operating outboard motor unless site-specific monitoring indicates noise <85 dBA.	Daily safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Fire	Fire extinguisher (serviced annually and inspected monthly) on board. Fuels stored in closed safety cans with flame arrestors, fire extinguisher (rated at least 20B) 8 – 23 meters from flammables storage area, no ignition sources within 15 meters of flammables storage area, flammables cabinet for storage of >25 gallons of flammables indoors, ignition sources prohibited in flammables storage and handling areas, fuel storage areas marked with No Smoking or Open Flame signs, bonding (metal to metal contact) for pouring fuels, gasoline-powered motor shut down during fueling.	Daily safety inspections.
Exposure to chemicals	PPE (level D) plus nitrile gloves for contact with potentially contaminated material, minimal contact, washing face and hands prior to taking anything by mouth. Hazardous waste medical clearance. Hazard communication training. MSDS for chemical tools on site. Chemical containers labeled to indicate contents and hazard.	PID or equivalent and other sampling as appropriate.
Temperature extremes	Administrative controls (see Section 8.0). Shaded or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0). Chilled drinks if temperature exceeds 70 degrees F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, wasps, snakes, poison ivy)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed. Inspect for ticks during the day and at end of work day. Avoidance of accumulations of bird or bat droppings (see Section 9.0).	Visual survey.
<i>Surface Water Sampling on Foot</i>		
General safety hazards (moving equipment, slips, falls)	Level D PPE (see Section 5.0). Hazardous waste safety training.	Daily site safety inspections.
Noise	None.	None.
Fire	None.	None.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Staying upwind of any dust-generating activities. Minimal contact. Hazard communication training for chemical tools. MSDSs for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work	None.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice a day. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, Lyme disease, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps for work in heavy underbrush during warm weather. PPE (boots, work clothes). Insect repellent, as necessary. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey.
<i>Vegetation Clearing with Chainsaws, Machetes, and Sling Blades</i>		
General safety hazards (rotating machinery, contact with sharp edges, slips, falls)	Level D PPE (see Section 5.0) plus hard hat. Only experienced operators. Personnel operating brush-clearing tools must maintain separation of at least 4.5 meters (15 feet). Tools must be inspected daily and taken out of service if damaged. Exclusion zone if there is a potential for entry of unauthorized personnel. Hazardous waste safety training.	Daily site safety inspections.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Chainsaw kickback and related hazards	Saws must have automatic chain brake or kickback device. Idle speed adjusted so chain does not move when idling. Saws must not be used to cut above shoulder height. Saws must be held with both hands when operating. Additional requirements at 385-1-1 Section 31.	Daily inspection.
Noise (chainsaw)	Hearing protection within 7.6 meters (25 feet) of operating chainsaw unless rig-specific monitoring indicates noise exposure of less than 90 decibels.	Daily safety inspections.
Fire (fuels)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with No Smoking or Open Flames signs. Fire extinguishers in all fuel use areas. Gasoline powered equipment turned off and allowed to cool for at least five minutes prior to fueling.	Daily safety inspection.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Hazard communication training. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	Daily safety inspection.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Biological hazards (bees, ticks, Lyme disease, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey.
Electric shock	Electrical tools must be double insulated or connected through heavy duty power cord to GFCI.	Daily safety inspection.
<i>Investigation-Derived Waste Handling</i>		
General hazards (lifting equipment, manual lifting, slips)	Level D PPE including heavy duty gloves for materials handling (see Section 5.0). Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm on fork trucks, bobcats, trucks, etc. Documented forklift training for forklift operators. Only experienced operators will be allowed to operate equipment. No personnel allowed under lifted loads. Lifts of over 50 pounds will be made with two or more personnel or with lifting equipment. Hazardous waste safety training. Compliance with EM 385-1-1 Sections 14 and 16.	Daily safety inspections of operations. Daily inspection of equipment to verify brakes and operating systems are in proper working condition.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Medical clearance for hazardous waste work.	Daily safety inspections.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with No Smoking or Open Flames signs. Fire extinguishers in all fuel use areas.	Daily safety inspection.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Noise	Hearing protection within 7.6 meters (25 feet) of any noisy drum moving equipment unless equipment-specific monitoring indicates exposures less than 90 decibels.	Daily safety inspections.
Biological hazards (bees, ticks, Lyme disease, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey.
Electric shock	Identification and clearance of overhead utilities.	Visual of all work areas.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
<i>Equipment Decontamination (Hot Water Washing, Soap and Water Washing, HCl, and Methanol Rinse)</i>		
General equipment decontamination hazards (hot water, slips, falls, equipment handling)	Level D PPE (see Section 5.0) plus nitrile or PVC gloves. Face shield and Saranex or rain suit (when operating steam washer). Hazardous waste safety training.	Daily safety inspections.
Noise (spray washer)	Hearing protection when washer is operating unless equipment-specific monitoring indicates that exposure is less than 90 decibels.	None.
Fire (decontamination solvents and gasoline)	Flammable material stored in original containers or in safety cans with flame arrestors. Fire extinguisher kept near decon area.	Daily safety inspection.
Contact with unexploded ordnance	On-site training in ordnance recognition for all field personnel. Clearance of sites for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Hazard communication training for chemical tools. MSDS on site. All chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	None.

Table 2-2 (continued)

Safety and Health Hazards	Controls	Monitoring
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice a day. Pulse rates at the start of each break if wearing impermeable clothing.

EOD = explosive ordnance disposal.
GFCI = ground fault circuit interrupter.
MSDS = Material Safety Data Sheet.
PPE = personal protective equipment.
PVC = polyvinyl chloride.

Table 2-3. Potential Exposures

Chemical^a	Health Effects/ Potential Hazards^b	Chemical and Physical Properties^b	Exposure Route(s)^b
Chromium	Eye irritation, sensitization	Solid; properties vary depending upon specific compound	Inhalation Congestion Contact
DNT (dinitrotoluene)	Suspected human carcinogen, anorexia, cyanosis, reproductive effects	Orange-yellow solid, VP: 1 mm; FP: 404°F	Inhalation Absorption Ingestion Contact
Gasoline (used for fuel)	Potential carcinogen per NIOSH, dizziness, eye irritation, dermatitis	Liquid with aromatic odor; FP: -45°F; VP: 38-300 mm	Inhalation Absorption Ingestion Contact
Hydrochloric acid (HCl)	Eye and skin irritation and/or destruction	Liquid with acrid odor; FP: NA; IP: NA	Inhalation Absorption Ingestion Contact
Lead	Weakness, anorexia, abdominal pain, anemia	Solid metal; VP: 0 mm; FP: NA; IP: NA	Inhalation Ingestion Contact
Liquinox (used for decontamination)	Inhalation of powder may cause local irritation of mucus membranes	White powder, odorless, nonflammable	Inhalation Ingestion Contact
Mercury	Irritation of eyes and skin; coughing, GI disturbance, anorexia	Silver liquid; FP: NA; VP: 0.0012 mm	Inhalation Absorption Ingestion Contact
Methanol (potentially used for equipment decontamination)	Eye and skin irritation, headache, cough; optic nerve damage	Liquid; VP: 96 mm; FP: 52°F; IP: 10.84 eV	Inhalation Absorption Ingestion Contact

Table 2-3. (continued)

Chemical ^a	Health Effects/ Potential Hazards ^b	Chemical and Physical Properties ^b	Exposure Route(s) ^b
RDX (cyclonite)	Explosive; irritation of eyes and skin, dizziness, weakness	White powder; FP: explodes; VP: 0.0004 mm at 230°F	Inhalation Absorption Ingestion Contact
Smokeless powder (nitrocellulose)	Low toxicity	Amorphous solid; FP: 55°F	Not given
TNT	Irritation of skin and mucus membranes, liver damage, kidney damage	Pale solid; FP: explodes; VP: 0.0002 mm	Inhalation Absorption Ingestion Contact
Arsenic	Dermatitis, nasal tissue damage, stomach upset, potential cancer	Solid; VP: 0 mm; FP: NA	Inhalation Indigestion Absorption Contact
Barium	Irritation of eyes, skin, lungs; muscle spasm	Solid; VP: Low; FP: NA	Inhalation Ingestion Contact
Cadmium	Breathing difficulty, cough, chest tightness, pain beneath the sternum, headache, chills, aches, vomiting	Solid; VP: 0 mm; FP: NA	Inhalation Ingestion Contact
Selenium	Irritation of eyes, skin, throat; liver and/or spleen damage	Solid; FP: NA; VP: 0 mm	Inhalation Ingestion Contact
Zinc	Irritant to eyes	Soft white metal with a bluish tinge	NA
Propellant (containing nitrocellulose and potentially nitroglycerin)	Faintness, rapid pulse, dizziness, muscle twitch, damage to blood cells, vomiting	Solid; VP: 0 mm; FP: NA May burn or explode if exposed to high temperatures or shock	Inhalation Ingestion Absorption Contact

^a The potential chemicals were obtained from the Draft Action Plan for the Ravenna Army Ammunition Plant, May 5, 1995.

^b From 1997 NIOSH Pocket Guide to Chemical Hazards, the Condensed Chemical Dictionary, Tenth Edition.

FP = flash point.

IP = ionization potential.

NA = not available.

NIOSH = National Institute for Occupational Safety and Health.

VP = vapor pressure.

3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

This section presents the general lines of authority, responsibilities, and communication procedures concerning site safety and health and emergency response. It includes key Contractor positions.

3.1 CONTRACTOR PROGRAM MANAGER

The Program Manager is responsible for ensuring conformance with Corporate, and U.S. Army policies and procedures. Specific responsibilities of the Program Manager include:

- coordinating with U.S. Army personnel,
- ensuring that project managers satisfy U.S. Army health and safety requirements,
- ensuring that project staff implement the SSHP,
- ensuring that projects have the necessary resources to operate safely, and
- ensuring that project personnel have the appropriate regard for safe job performance.

3.2 CONTRACTOR CERTIFIED INDUSTRIAL HYGIENIST

The Contractor Certified Industrial Hygienist (CIH) manages the health and safety program. This includes establishing health and safety policies and procedures, supporting project and office activities, and verification of safe work practices and conditions. The specific responsibilities of the CIH include:

- coordinating with U.S. Army health and safety personnel,
- reviewing and approving SSHPs,
- approving downgrades in personal protective equipment (PPE) or protective procedures, and
- interfacing with project personnel through routine communications and audits of selected projects.

3.3 CONTRACTOR PROJECT MANAGER

The Project Manager is responsible for overall project execution. The responsibilities of the Project Manager include:

- coordinating with U.S. Army personnel, including reporting accidents and incidents to the U.S. Army Project Manager immediately and submitting written reports within 2 working days;
- ensuring implementation of the Facility-wide Safety and Health Plan (FSHP) and addenda;
- maintaining auditable project documentation of all required records;
- ensuring that a qualified Site Safety and Health Officer (SSHO) is designated; and
- maintaining a current copy of the FSHP and addenda.

3.4 CONTRACTOR FIELD OPERATIONS MANAGER OR TASK LEADER

The Field Operations Manager or Task Leader will oversee the field activities associated with a project and will be responsible for site accessibility, safety, and quality assurance. He/she is responsible for enforcing the field requirements of the FSHP and its addendum. Specific responsibilities of the Field Operations Manager or Task Leader are:

- enforcing compliance with the FSHP and its addendum;
- coordinating on-site operations, including subcontractor activities;
- ensuring that subcontractors follow the requirements of the FSHP and its addendum;
- coordinating and controlling any emergency response actions;
- ensuring that at least two persons currently certified in first aid/cardiopulmonary resuscitation are on-site during site operations; and
- maintaining current copies of the FSHP and its addendum, Environmental Management (EM) 385-1-1, "U.S. Army Corps of Engineers Safety and Health Requirements Manual," and the SSHP Addendum on-site.

3.5 SITE SAFETY AND HEALTH OFFICER

The SSHO is responsible for implementing the FSHP, making health and safety decisions for specific health and safety activities and for verifying the effectiveness of the health and safety program. The SSHO's qualifications include, at a minimum, experience with similar projects, knowledge of and understanding of the FSHP and its addendum, and the ability to use the required monitoring equipment. The SSHO has primary responsibility for the following:

- stopping work or upgrading protective measures (including protective clothing) if uncontrolled health and safety hazards are encountered. Indications of uncontrolled health and safety hazards include monitoring instrument readings in excess of the established action limits, heavy equipment without back-up alarms, exposed unexploded ordnance, unguarded moving/rotating equipment, exposed electrical connections, non-compliance with Health and Safety (H&S) requirements, encountering liquids other than water, soil staining suggestive of unexpectedly high concentrations of nonvolatile contaminants, etc. The SSHO must also authorize resumption of work following correction of the adverse condition(s);
- implementing and verifying compliance with this FSHP and its addendum and reporting to the Field Operations Manager or Task Leader, Project Manager, and Health and Safety Manager any deviations from anticipated conditions;
- conducting daily safety inspections;
- documenting deficiencies identified in the daily inspections and responsible parties, procedures, and timetables for correction;
- ensuring that site personnel have access to this plan and are aware of its provisions;

- conducting a site-specific pre-entry health and safety briefing covering potential chemical and physical hazards, safe work practices, and emergency procedures;
- maintaining on-site auditable documentation of
 - Material Safety Data Sheets (MSDS) for applicable materials utilized at the site;
 - training for site workers and visitors;
 - calibration/maintenance of field instruments such as photoionization detectors, combustible gas indicators, etc.;
 - environmental and personal exposure monitoring results;
 - notification of accidents/incidents;
 - reports of any overexposure or excessive levels;
 - notification of employees of exposure data; and
 - medical surveillance.
- confirming that all on-site personnel have received the training listed in the Training Requirements section (Section 4.0) of this FSHP;
- issuing respirators, as necessary, and ensuring that all respirator users have received medical clearance within the last year, have been properly trained, and have been successfully fitted for respiratory protection;
- verifying that the FSHP's emergency points of contact are correct and supplying correcting information as necessary;
- ensuring that all monitoring equipment is operating according to the manufacturer's specifications and performing field checks of instrument calibration;
- ensuring monitoring for potential on-site exposures is conducted in accordance with the FSHP and its addendum;
- investigating accidents and near accidents and reporting (in concert with Field Operations Manager or Task Leader) same to Project Manager and CIH;
- conducting daily "tailgate" safety briefings; and
- controlling visitor access to the exclusion zone.

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4.0 TRAINING

Personnel who participate in the investigation of an AOC are subject to the following training requirements, which are presented in Table 4-1.

Table 4-1. Training Requirements

Training	Worker	Supervisor	Site Visitor (exclusion zone)
HAZWOPER (40-hour, 3-day OJT)	√	√	√
HAZWOPER Annual Refresher (8 hour)	√	√	√
HAZWOPER Supervisors Training (8 hour)		√	
American Red Cross Standard First Aid (5.5 hours)	√	√	
General Hazard Communication Training (Contained in 40-hour and 8-hour courses)	√	√	
Respiratory Protection Training (required only if respirators are worn; contained in 40-hour course)	√	√	√
Hearing Conservation Training (for workers in hearing conservation program; contained in 40-hour and 8-hour courses)	√	√	√
Pre-entry Briefing	√	√	√
Site Specific Hazard Communication (contained in pre-entry briefing)	√	√	
Safety Briefing (daily and whenever conditions or tasks change)	√	√	√
Emergency Responder (43.5 hr)	√	√	

√ = Required
 HAZWOPER = Hazardous Waste Site Operations
 OJT = on-the-job training

The following paragraphs present brief summaries of the training requirements. These summaries include a course description and guidance on who must take each course.

4.1 OFF-SITE TRAINING

The 40-hour Hazardous Waste Site Worker course is required for hazardous, toxic, and radioactive waste activities in the exclusion (contamination) zone, contamination reduction (buffer) zone, or other hazardous areas on-site. Three days of relevant field experience are required in conjunction with this training.

The 8-hour Hazardous Waste Refresher course is required annually to maintain currency in the 40-hour course.

The Hazardous Waste Supervisor's Training is required for personnel who directly supervise hazardous waste site workers. This course must address the health and safety program and procedural requirements of the supervisor's company. Note that the 40-hour course is a prerequisite.

General Hazard Communication Training is required for all site workers. This training must communicate the risks and protective measures for chemicals that employees may encounter. This requirement is met by taking Hazardous Waste training and site-specific hazard communication training addressing the chemicals in use on the project. MSDS must be kept on-site during field investigations, for all chemicals expected to be encountered or used on-site.

All on-site employees must be certified in the 5.5-hour. American Red Cross Standard First Aid course. At least one on-site individual, preferably the SSHD, must be currently certified in the 43.5-hour. American Red Cross Emergency Response.

Respiratory Protection Training is required for all individuals who wear respirators. This requirement can be met by taking the 40-hour Hazardous Waste Site Worker course, annual refreshers, and site-specific training covering the types of respirators to be used on site. Respirator fit-test certifications must be kept on-site for anyone who might wear one.

Hearing Conservation Training is required on an annual basis by *29 Code of Federal Regulations (CFR) 1910.95* for all employees enrolled in a hearing conservation program. This will include all employees exposed to occupational noise in excess of 85 decibels on a time weighted average.

4.2 SITE-SPECIFIC TRAINING

Personnel on-site must have received the investigation-specific safety training. Two versions of this training will be used. The site worker version will contain full information regarding site hazards, hazard controls, and emergency procedures. A shortened version will be used for visitors who will be on-site for short times and who will not do hands-on work. This shortened version will contain the hazard information that is directly relevant to the purpose of the visit. Signatures of those attending and the type of briefing must be entered in the field logbook before site access will be granted. Note that casual visitors (package deliverers, observers, etc.) to the support zone will not be required to have the site-specific training. The site-specific training will include the following site-specific information:

- names of site health and safety personnel and alternates;
- contents of the FSHP and appropriate addendum;
- hazards and symptoms of contaminant exposure;
- hazards and symptoms of exposure to chemicals present in the workplace;
- physical hazards in the workplace;
- recognition and avoidance of live ordnance;
- site and task PPE (including purpose, donning, doffing, proper use);
- safe work practices to minimize risks;
- safe use of engineering controls and equipment;
- medical surveillance requirements;
- site control measures;
- reporting requirements for spills and emergencies;
- personnel decontamination procedures;
- contingency plans (communications, phone numbers, emergency exits, assembly point, etc.);
- spill containment procedures (reporting, clean-up methods, etc.); and
- emergency equipment locations and use (fire extinguishers, spill kits, etc.).

Safety Briefings will be held at least daily and also when conditions or tasks change. These briefings will be conducted by the SSHO and/or operations manager and will be attended by all site workers and supervisors. These briefings will address site-specific safety issues and will be used as an opportunity to refresh workers on specific procedures and to address new hazards and controls.

4.3 DOCUMENTATION

Documentation of the required training must be maintained in the on-site project files. This documentation will include copies of 40-hour, 8-hour refresher, respirator fit-test certifications, and supervisor training certificates, copies of medical clearance reports, and entries in project logs showing the topics covered, trainer, and signatures of those attending on-site training.

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5.0 PERSONAL PROTECTIVE EQUIPMENT

PPE for site tasks is based on potential site-specific hazards. In cases where multiple hazards are present, a combination of protective equipment will be selected so that adequate protection is provided for each hazard. When a conflict exists with the PPE requirements, the more restrictive shall apply. This section emphasizes the programmatic requirements for PPE. For task-specific equipment see the Hazard/Risk Analysis section.

5.1 PPE PROGRAM

PPE use must comply with 29 *CFR* 1910 Subpart I and EM 385-1-1 Section 5. The level of protection and types of materials selected for a particular task must be based on the following:

- potential for exposure because of work being done;
- route of exposure;
- measured or anticipated concentration in the medium of concern;
- toxicity, reactivity, or other measure of adverse effect; and
- physical hazards such as falling objects, flying projectiles, etc.

In situations where the type of contamination, concentration, and probability of contact are not known, the appropriate protection is selected based on the professional judgment of the Contractor's CIH until the hazards are further evaluated.

The SSHO may raise or lower the level of PPE worn by the teams, depending upon the site-specific hazards encountered in the field. Prior to lowering the level of PPE, the Field Task Leader and the Contractor CIH must be contacted/consulted and approval given and documented. If site conditions are such that the level of PPE is insufficient or work must be stopped, the SSHO will take appropriate action immediately and the appropriate personnel (see above) will be contacted afterwards. Criteria indicating a possible need for reassessment of the PPE selection include the following:

- introduction of new types of equipment;
- commencement of an unplanned (hazard not previously assessed) work phase;
- working in unplanned temperature extremes;
- evidence of contamination such as discolored soil or elevated instrument readings near the soil;
- exceeding the action limits; or
- changing the work scope so that the degree of contact with contaminants changes.

5.2 TYPES OF EQUIPMENT

This section presents the types of protective clothing that may be used for the project. Requirements for task-specific levels of protective clothing are presented in the Hazards Analysis table (Table 2-2). Levels of protection that will be used to protect against chemical and physical hazards at this site include:

- Level C Protective Equipment
 - full-face respirator and air purifying cartridges capable of filtering out organic vapors, acid gasses, and radionuclides

- hooded chemical-resistant clothing (Polyethylene-coated Tyvek[®] or equivalent) with all openings taped
 - two pair chemical-resistant gloves (nitrile and exam gloves)
 - heavy duty leather or equivalent gloves (in addition to chemical resistant gloves) for materials handling or other tasks that pose physical hazards to the hands
 - safety boots
 - shoe covers
 - hard hat (if overhead hazards are present)
- Level D+ Protective Equipment
 - Tyvek[®] or equivalent coveralls
 - nitrile or polyvinyl chloride (PVC) gloves
 - heavy duty leather or equivalent gloves (in addition to chemical resistant gloves) for materials handling or other tasks that pose physical hazards to the hands
 - safety boots
 - boot covers
 - hard hat (if overhead hazards are present)
 - safety glasses with side shields
- Level D Protective Equipment
 - coveralls/field clothes
 - safety boots
 - safety glasses with side shields
 - hard hat (if overhead hazards are present)
 - nitrile or equivalent gloves if contaminated materials are handled
 - heavy duty leather or equivalent gloves (in addition to chemical resistant gloves) for materials handling or other tasks that pose physical hazards to the hands

5.3 CLEANING, STORAGE, AND PROGRAM VERIFICATION

If site tasks require the use of chemical protective clothing, disposable clothing will be used and will be disposed as part of project generated waste. Unused chemical protective clothing will be stored in clean staging areas until needed. The SSHO will verify that the PPE in use is appropriate and is being used properly.

6.0 MEDICAL SURVEILLANCE

All employees performing on-site hazardous waste-related work will be enrolled in a medical surveillance program to meet the requirements of 29 *CFR* 1910.120(f), 1910.134, 1910.20 to assess and monitor workers' health and fitness for employment in this field. Employees must be provided with summaries of medical examination results following each examination and must be provided more detailed information upon written request.

6.1 FREQUENCY OF EXAM

The frequency of employee medical exams shall be as follows:

- prior to assignment;
- once every 12 months for each employee covered unless the attending physician believes a shorter or longer interval (not to exceed 2 years) is appropriate;
- at termination of employment or reassignment to an area where the employee would not be covered, if the employee has performed field work since his/her last examination and has not had an examination within the last 6 months;
- as soon as possible upon notification by an employee that he/she has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limit or published exposure levels in an emergency situation.

6.2 MEDICAL EXAM CONTENT

Medical examinations shall include a medical and work history (or updated history if one is available in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances. The examination will determine potential health impairments and fitness for duty, including the ability to wear any required PPE. As a minimum, the exam will include:

- collection of information on the employee's medical and work history;
- hands-on examination;
- audiometry;
- blood screen such as Sequential Multiple Analyzer with Computer 24;
- chest P/A X-ray at intervals specified by attending physician;
- complete blood count;
- electrocardiogram for persons older than 45 or where medically indicated;
- physical examination;
- spirometry (forced expiratory volume/forced vital capacity); and
- urinalysis (dipstick and microscopic).

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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, will be established for this monitoring and be listed in the project-specific addendum to this FSHP. 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 investigation-specific addenda will contain the minimum monitoring requirements and action levels for each AOC. In the event that a determination is made that no monitoring is necessary, the justification for this determination must be incorporated into the SSHP Addendum.

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8.0 HEAT/COLD STRESS

8.1 MONITORING AND CONTROLS

Important factors in preventing heat stress-induced illnesses are acclimatization, consumption of copious quantities of fluids, and appropriate work/rest cycles. General controls will consist of making fluids readily available, use of the buddy system, and taking scheduled and unscheduled breaks in a temperature-controlled environment as necessary. The following specific steps will be taken to reduce the potential for heat stress-induced illness.

- If ambient temperatures exceed 70° F, site training will include heat stress control, recognition of heat stress induced illness, and first aid for heat stress.
- If ambient temperatures exceed 70° F, cool Gatorade or equivalent drink or water will be made conveniently available to site workers.
- If ambient temperatures exceed 70° F, workers will be instructed to monitor their own and their buddy's condition relative to heat stress.
- If ambient temperatures exceed 70° F, an initial work/rest cycle based on the American Conference of Governmental Industrial Hygienists heat stress threshold limit value will be instituted per the following table. These requirements may be modified based on site specific conditions and the capabilities of the work crew.

Work-Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	86 ^b	80	77
45 min. work/15 min. rest ^a	87	82	78
30 min. work/30 min. rest	89	85	82
15 min. work/45 min. rest	90	88	86

^a Non-work, sitting in the shade or air conditioned area.

^b Wet bulb globe temperature (WBGT) index expressed in degrees Fahrenheit or standard dry bulb temperature if WBGT is unavailable.

- Workers will be allowed to take unscheduled breaks, if needed.
- Workers wearing Tyvek® or other impermeable clothing when ambient temperatures exceed 70° F will be monitored for heat stress by taking their pulses at the beginning of each rest period. If any worker's heart rate exceeds 110 beats per minute, the next work period will be shortened by one third [From National Institute of Occupational Safety and Health (NIOSH)/Occupational Safety and Health Administration (OSHA)/United States Coast Guard/U.S. Environmental Protection Agency; Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities].

Critical factors in preventing cold stress disorders are adequate clothing and staying dry. The SSHO and Field Task Leader will ensure the capability to quickly move individuals who become wet to a sheltered, warm area. The following specific steps will be taken (adapted from American Conference of Governmental Industrial Hygienists Threshold Limit Values booklet).

- If ambient temperatures are less than 40° F, site training will include prevention of cold injury, cold injury symptoms, and cold injury first aid.
- A heated break area will be provided if ambient temperatures are less than 32° F.
- As a minimum, breaks will be taken in a warm area every 120 minutes if ambient temperatures are less than 32° F.
- Workers will be allowed to take unscheduled breaks, if needed, in a warm area.
- No outdoor work will be performed if the equivalent chill temperature (temperature combined with the effect of wind) is less than -29° F.

8.2 HEAT/COLD STRESS INDUCED ILLNESS

Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness, nausea
- Fainting

Heat stroke is the most serious form of heat-related illness and should always be treated as a medical emergency. The body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include:

- Red, hot, usually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse and confusion
- Coma

Hypothermia is the uncontrolled loss of body heat. As the body's core temperature decreases, bodily functions are slowed. The victim becomes weak and disoriented and may become comatose if steps are not taken to return the core temperature to the normal range. Hypothermia can occur whenever temperatures are below 45° F and is most common during wet, windy conditions, with temperatures between 40 to 30° F. The principal cause of hypothermia in these conditions is loss of insulating properties of clothing due to moisture, coupled with heat loss due to wind and evaporation of moisture on the skin.

Frostbite is the freezing of body tissue, which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when ambient temperatures are below 32° F. The risk of frostbite increases as the temperature drops and wind speed increases.

9.0 STANDARD OPERATING SAFETY PROCEDURES

This section presents general safety rules applicable to the anticipated tasks. The provisions of the plan are mandatory for all on-site employees and visitors. This includes employees engaged in initial site reconnaissance, preliminary field investigations, mobilization, project operations, and demobilization. These standard operating procedures are offered for guidance. It is the Contractor's responsibility to ensure that appropriate and sufficient procedures are used to protect its employees.

9.1 SITE RULES

The following rules apply to all site activities.

- All work will be conducted in compliance with EM 385-1-1, the "U.S. Army Corps of Engineers Safety and Health Requirements Manual."
- Daily safety briefings ("tailgate") will be held during field activities to inform personnel of new hazards or procedures.
- The SSHO or Field Operations Manager or Task Leader will conduct and document daily safety inspections.
- Personnel will notify the SSHO of any medical conditions (e.g., allergic to bee stings, diabetes, pregnancy) that require special consideration.
- Personnel will maintain proper workplace housekeeping to minimize the potential for tripping and other accidents.
- Contact with potentially contaminated substances will be avoided. Site personnel in the exclusion zone will avoid walking through puddles, pools, mud, kneeling on the ground, and placing equipment on the ground.
- Spills will be prevented to the extent possible. In the event that a spill occurs, the material will be contained.
- All injuries and accidents requiring first aid will be reported to the SSHO, Field Operations Manager or Task Leader, Contractor CIH, and the U.S. Army Project Manager.
- All workers in the exclusion zone or other hazardous areas will abide by a buddy system. Members of a buddy team will maintain verbal or visual contact.

9.2 PERMIT REQUIREMENTS

Contractor will obtain and/or coordinate with U.S. Army to obtain, as necessary, all permits necessary for the safe execution of this project. As a minimum, this will include digging permits/clearance from local utilities prior to any drilling, excavation, etc.

9.3 DRUM/CONTAINER HANDLING

No drums of unknown material are expected to be addressed as part of this project. Should it become necessary to address drums of unknown materials, this work will be performed in accordance with 29 *CFR* 1910.120(j) and EM 385-1-1 Section 28.H. Any drums used for the project will meet the requirements of the Facility-wide Sampling and Analysis Plan and its addenda.

9.4 CONFINED SPACE ENTRY

Any confined space entry will be performed in conformance with the requirements of 29 *CFR* 1910.146, and EM 385-1-1 Section O6I. The minimum applicable requirements are: completion of an entry permit, atmospheric testing for oxygen (must be 19.5 to 22%), atmospheric testing for toxic gases (must be less than 5 ppm or chemical-specific limit), atmospheric testing for flammable gases (must be less than 10% of the lower explosive limit and stationing an attendant nearby but outside the excavation.

9.5 HOT WORK, SOURCES OF IGNITION, FIRE PROTECTION

- This work will be conducted in accordance with EM 385-1-1 Section 9.
- Hot work (oxyfuel cutting) will be conducted using welder's helmet or shaded goggles, leather gloves, and long-sleeved shirt.
- A fire extinguisher rated not less than 10-ABC will be immediately available in the vicinity of hot work.
- Sources of ignition will be kept at least 15.2 meters (50 feet) from flammables storage areas.
- Flammables storage areas will be posted with signs indicating "No smoking or open flame."
- At least one fire extinguisher with a rating of not less than 20-B will be kept 7.6 to 22.9 meters (25 to 75 feet) from all flammables storage areas.
- An approved flammables cabinet will be used to store 94.6 or more liters (25 or more gallons) of flammable liquid.
- Flammable liquids (other than decontamination solvents) will be kept in safety containers with flame arresters.

9.6 ELECTRICAL SAFETY

- This work will be conducted in accordance with 29 *CFR* 1910 Subpart S and EM 385-1-1 Section 11.
- All portable electrical equipment will be double insulated or grounded and connected through a ground fault circuit interrupter.

- Conductive materials (drill rigs) will be kept clear of energized power lines. The following minimum distances will be observed: 0 to 50 kV (10 feet); 51 to 100 kV (12 feet); 101 to 200 kV (15 feet); 201 to 300 kV (20 feet); 301 to 500 kV (25 feet); 501 to 750 kV (35 feet); 750 to 1000 kV (45 feet).

9.7 EXCAVATION AND TRENCH SAFETY

Trench excavation potentially poses the following hazards: contact with buried utilities, trench cave-in and engulfment, confined space hazards such as hazardous airborne concentrations of toxic chemicals, flammable concentrations of vapors or gases, and oxygen deficiency. The depth of the excavation and the nature of the excavated material significantly impact the potential hazard—the greater the depth, the greater the hazard.

Prior to opening an excavation, the site will be verified free of underground utilities by contacting the local utility companies or appropriate base personnel. If underground utilities are present, they will be located and protected from damage or movement. Other location-specific hazards, such as the potential for unexploded ordnance, building foundations, unstable rocks, etc., will also be controlled.

Cave-in hazards will be controlled by excluding personnel from inside or near (within 3 feet) excavations 5 feet deep or deeper. This restriction will not be applied to excavations less than 5 feet deep if the SSHO or Field Manager has examined the excavations and determined there is no potential for cave-in.

If it becomes necessary for personnel to enter trenches deeper than 1.2 meters (4 feet), the requirements of 29 *CFR* 1926.651 and EM 385-1-1 Section 25 will be applied. This will include daily inspections of the excavation and shoring or sloping the trench sides to meet the requirements of EM 385-1-1 25.C. Shoring will be accomplished using a trench box with rigid sides to prevent engulfment. If a trench box is not utilized, the trench sides will be sloped at a 34° angle (one and one-half horizontal to one vertical). All spoils will be located at least 0.6 meters (2 feet) from the edge of the excavation. Such entry will also be treated as confined space entry and procedures will comply with the confined space entry section of this plan.

9.8 MACHINE GUARDING

All equipment will be operated with all guards provided by the manufacturer and in compliance with 29 *CFR* 1910 Subpart O and EM 385-1-1 Section 16B. If any guarding must be removed for servicing, the equipment will be disabled to preclude movement or release of energy.

9.9 LOCKOUT/TAGOUT

All potentially hazardous servicing or equipment repair will be governed by 29 *CFR* 1910.147 and EM 385-1-1 Section 12. No such activities are anticipated for this project.

9.10 FALL PROTECTION

Work areas with the potential for a fall of 1.2 meters (4 feet) or more will be provided with fall protection in compliance with EM 385-1-1 Section 21.A.15. This fall protection will consist of guardrails or personal fall protection. Personal fall protection will be used if it is necessary for drilling personnel to climb the upright mast or derrick.

9.11 HAZARD COMMUNICATION

Hazard communication will be governed by 29 *CFR* 1910.1200 and EM 385-1-1 Section 8. As a minimum, the following steps will be taken.

- All hazardous materials on-site will be labeled to comply with the hazard communication standard.
 - clear labeling as to the contents,
 - the appropriate hazard warning, and
 - the name and address of the manufacturer.
- MSDS will be available on site for all hazardous materials that are present.
- Site-specific training will include the hazards posed by site chemicals, protective measures, and emergency procedures.
- Copies of MSDS for all hazardous chemicals (chemicals brought on-site) will be maintained in the work area. MSDS will be available to all employees for review during each work shift.

9.12 ILLUMINATION

All site field work will be conducted during daylight hours (no earlier than 15 minutes after sunrise and no later than 15 minutes before sunset) and natural illumination will be used. Non-field work conducted in buildings will be illuminated to meet the following minimums stated in 29 *CFR* 1910.120 (meters) and EM 385-1-1 Section 7: general outdoors 3-foot candles, stairs and ladders 10-foot candles, offices 50-foot candles, and first aid areas 30-foot candles.

9.13 SANITATION

- Sanitation will comply with 29 *CFR* 1910.120(n) and EM 385-1-1 Section 2.
- Means for washing hands and faces prior to eating will be provided at the work site.
- Potable drinking water will be provided in labeled, sanitary dispensers.
- Toilets shall be provided according to the following: 20 employees = 2 toilets, 21 to 199 employees = 1 toilet seat and 1 urinal per 40 workers.

9.14 DRILL RIG OPERATIONS

General Drilling Practices will comply with EM 385-1-1 Section 16M

- Operating manuals will be present on-site for each type of drill rig in use.
- Drill rigs will have at least two functional kill switches, one for the driller and one for the driller's helper. These switches will be confirmed to be functional each day that the rig is used.
- Drill rigs will have functional backup alarms.

- Drill rigs will be inspected weekly by the driller, and this inspection will be confirmed by the SSHO.
- Only the driller, driller's helper, and personnel who have a critical need will be allowed near moving parts of the drill rig.
- Drill sites will be verified free of underground utilities by clearing each site with local utilities or appropriate installation personnel prior to beginning drilling.
- Drill-mounted fire-fighting equipment will not be tampered with and will not be removed for other than the intended fire-fighting purposes or for servicing.
- Drilling crews and personnel who work near the drill rig will be trained in the location and use of the kill switches.
- If lubrication fittings are not accessible with guards in place, machinery will be stopped and disabled (locked out or ignition key removed) for oiling and greasing.
- Work areas and walkways will not be obstructed.

Hoisting Operations

- The derrick (mast) will not be raised unless the area is free of overhead obstructions and far enough (see Electrical Safety) from power lines.
- The derrick will not be raised until the rig has been blocked, leveled, and chocked.
- Rigging equipment for material handling will be checked prior to use on each shift and as often as necessary to ensure it is safe. Defective rigging will be removed from service.
- A hoisting line with a load imposed will not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.
- Workers will stand clear of the well bore when any wire line device is being run.
- No loads will be lifted over workers.

Cat Line Operations

- The cat head area will be kept free of obstructions and entanglements.
- The operator will not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.
- Personnel will not stand near, step over, or go under a cable or cat line that is under tension.

9.15 UNEXPLODED ORDNANCE

Work that involves, or may involve, exposure to ordnance will be conducted in compliance with LTR 385-98-1, June 1998, "Explosives Safety Policy for Real Property Containing Conventional

Ordnance and Explosives.” The Contractor will, at a minimum, follow the UXO procedures listed below for work in all areas at RVAAP. If UXO is identified or a potential hazard at an AOC to be investigated by the Contractor, specific procedures for UXO avoidance will be added to the investigation-specific SSHP addendum.

- All on-site workers will be trained to recognize and avoid the types of ordnance that may be present.
- Contractor and its subcontractors will not handle, move, or otherwise disturb ordnance or any items that cannot be identified as non-ordnance without specific authorization from the U.S. Army.
- If ordnance or potential ordnance is discovered, work will be stopped, and the area will be evacuated and cordoned off.
- If ordnance or potential ordnance is discovered, the facility security organization will be notified immediately.
- If ordnance or potential ordnance is discovered, the U.S. Army project manager will be notified immediately.
- For work in areas where UXO may reasonably be expected (former ordnance disposal sites), qualified explosive ordnance disposal (EOD) personnel or qualified UXO personnel will survey (visual and magnetometer) prior to other work and establish appropriate controls.

9.16 HISTOPLASMOSIS

Histoplasmosis is an infectious disease caused by inhaling the spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else. Histoplasmosis primarily affects a person’s lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects), or they experience symptoms so mild they do not seek medical attention and may not even realize that their illness was histoplasmosis. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. Special antifungal medications are needed to arrest the disease. The most severe and rarest form of this disease is disseminated histoplasmosis, which involves spreading of the fungus to other organs outside the lungs. Disseminated histoplasmosis is fatal if untreated, but death can also occur in some patients even when medical treatment is received.

H. capsulatum grows in soils throughout the world. In the United States, the fungus is endemic (more prevalent) and the proportion of people infected by *H. capsulatum* is higher in central and eastern states, especially along the valleys of the Ohio, Mississippi, St. Lawrence rivers, and the Rio Grande. The fungus seems to grow best in soils having a high nitrogen content, especially those enriched with bat droppings or bird manure. Disturbances of contaminated material cause small *H. capsulatum* spores to become airborne or aerosolized. Once airborne, spores can easily be carried by wind currents over long distances. For additional information, see HISTOPLASMOSIS: *Protecting Workers at Risk*, Department of Health and Human Services (NIOSH) Publication, No. 97-146 September 1997.

The following actions must be taken to minimize the potential for infection.

- Workers who will disturb collections of bird or bat droppings must be trained in the potential hazard and control measures.
- Avoid disturbing collections of bird or bat droppings in any way that causes airborne dust.
- If collections of bird or bat droppings will be disturbed, wet droppings with water and surfactant before disturbing and continuously during disturbance.
- Stop work and take additional corrective action if visible airborne dust is observed.
- Use particulate respirators and disposable coveralls for work that may involve potentially significant or uncontrolled exposure to collections of droppings.

9.17 LYME DISEASE

Lyme disease is an infection caused by the corkscrew-shaped bacteria *Borrelia burgdorferi* that is transmitted by the bite of deer (*Ixodes scapularis*) and western black-legged (*Ixodes pacificus*) ticks. The deer tick, which normally feeds on the white-footed mouse, the white-tailed deer, other mammals, and birds, is responsible for transmitting Lyme disease bacteria to humans in the northeastern and north-central United States. On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged tick. Ixodes ticks are much smaller than common dog and cattle ticks. In their larval and nymphal stages, they are no bigger than a pinhead. Adult ticks are slightly larger. Ticks feed on blood by inserting their mouth parts (not their whole bodies) into the skin of a host animal. They are slow feeders: a complete blood meal can take several days. As they feed, their bodies slowly enlarge.

The number of annually reported cases of Lyme disease in the United States has increased about 25-fold since national surveillance began in 1982, and a mean of approximately 12,500 cases annually were reported by states to the Centers for Disease Control and Prevention from 1993-1997. In the United States, the disease is mostly localized to states in the northeastern, mid-Atlantic, and upper north-central regions, and to several counties in northwestern California. Personnel who engage in outdoor occupations, such as landscaping, brush clearing, forestry, and wildlife and parks management in endemic areas may be at risk of getting Lyme disease.

For Lyme disease to exist in an area, at least three closely interrelated elements must be present in nature: (1) the Lyme disease bacteria, (2) ticks that can transmit the bacteria, and (3) mammals (such as mice and deer) to provide food for the ticks in their various life stages. Ticks that transmit Lyme disease can be found in temperate regions that may have periods of very low or high temperature and a constant high relative humidity at ground level. The life cycle of these ticks requires 2 years to complete. Adult ticks feed and mate on large animals, especially deer, in the fall and early spring. Female ticks then drop off these animals to lay eggs on the ground. By summer, eggs hatch into larvae. Larvae feed on mice and other small mammals and birds in the summer and early fall and then are inactive until the next spring when they molt into nymphs. Nymphs feed on small rodents and other small mammals and birds in the late spring and summer and molt into adults in the fall, completing the 2-year life cycle. Larvae and nymphs typically become infected with Lyme disease bacteria when they feed on infected small animals, particularly the white-footed mouse. The bacteria remain in the tick as it changes from larva to nymph or from nymph to adult. Infected nymphs and adult ticks then bite and transmit Lyme disease bacteria to other small rodents, other animals, and humans, all in the course of their normal feeding behavior.

Ticks search for host animals from the tips of grasses and shrubs (not from trees) and transfer to animals or persons that brush against vegetation. Ticks only crawl; they do not fly or jump. Ticks found on the scalp usually have crawled there from lower parts of the body. Ticks can attach to any part of the human body but often attach to the more hidden and hairy areas such as the groin, armpits, and scalp. Research in the eastern United States has indicated that, for the most part, ticks transmit Lyme disease to humans during the nymph stage, probably because nymphs are more likely to feed on a person and are rarely noticed because of their small size. Thus, the nymphs typically have ample time to feed and transmit the infection (ticks are most likely to transmit infection after approximately 2 or more days of feeding). Tick larvae are smaller than the nymphs, but they rarely carry the infection at the time of feeding and are probably not important in the transmission of Lyme disease to humans. Adult ticks can transmit the disease, but since they are larger and more likely to be removed from a person's body within a few hours, they are less likely than the nymphs to have sufficient time to transmit the infection. Moreover, adult Ixodes ticks are most active during the cooler months of the year, when outdoor activity is limited. For additional information, see the Centers for Disease Control, Division of Vector-Borne Diseases, multiple Lyme Disease publications.

The following control measures must be followed.

- Whenever possible, avoid entering areas that are likely to be infested with ticks, particularly in spring and summer when nymphal ticks feed. Ticks favor a moist, shaded environment, especially that provided by leaf litter and low-lying vegetation in wooded, brushy or overgrown grassy habitat.
- Wear light-colored clothing so that ticks can be spotted more easily and removed before becoming attached.
- Wear long pants and tuck pant legs into socks or boot tops or close the pant legs with tape or other means.
- Apply insect repellents containing DEET (n,n-diethyl-m-toluamide) to clothes and exposed skin.
- If it is necessary to enter areas with known heavy infestation, consider applying permethrin (which kills ticks on contact) to clothes.
- Conduct daily checks for ticks. Embedded ticks should be removed using fine-tipped tweezers. DO NOT use petroleum jelly, a hot match, nail polish, or other products. Grasp the tick firmly and as closely to the skin as possible. With a steady motion, pull the tick's body away from the skin. The tick's mouthparts may remain in the skin, but do not be alarmed. The bacteria that cause Lyme disease are contained in the tick's midgut. Cleanse the area with an antiseptic.
- Note the date of removal of any imbedded tick and seek medical attention if any signs and symptoms of early Lyme disease, ehrlichiosis, or babesiosis develop over the ensuing days or weeks.

9.18 ROCKY MOUNTAIN SPOTTED FEVER

Rocky Mountain Spotted Fever is a rickettsial disease caused by the organism, *Rickettsia rickettsii*. It is transmitted by the bite of an infected tick and results in a systemic, febrile illness. Several ticks are responsible for the spread of this disease, and these vary by geographic region. The dog tick, *Dermacentor variabilis*, is probably the most common vector. According to the Ohio Department of Health, the incidence of Rocky Mountain Spotted Fever has increased in recent years.

The organism becomes infectious after the tick has been attached to the skin for at least four to six hours. It can also be transmitted in the process of tick removal if the tick is crushed, allowing infectious material to escape.

Symptoms of Rocky Mountain Spotted Fever include the sudden onset of a moderate to high fever (which can last two to three weeks if untreated), muscle pain, severe headache, and chills. A rash occurs in about half of the cases. It starts with the extremities and soon spreads to the palms of the hands and soles of the feet, then quickly spreads to the trunk and rest of the body.

Rocky Mountain Spotted Fever is treated by daily oral or intravenous doses of tetracyclines (usually doxycycline) for five to seven days and for at least 48 hours after an infected person is afebrile (without a fever). Treatment should be initiated (unless tetracyclines are contraindicated) on clinical and epidemiological considerations without waiting on laboratory confirmation of the diagnosis.

Control measures are the same as those for Lyme disease ticks.

9.19 IONIZING RADIATION

All work involving regulated radiation sources must be conducted in accordance with the requirements of EM 385-1-1, Section 06.E, Ionizing Radiation. Requirements include, but are not limited to:

- A Department of Defense form 3337, Application for Army Radiation Authorization, must be completed and approved by RVAAP prior to bringing a source onto RVAAP.
- All regulatory requirements, including source security, must be met during the period the source is on RVAAP.
- RVAAP must be notified when the source is removed.

9.20 FUELS

RVAAP procedures for use and storage of fuels, such as gasoline and diesel fuel, must be followed. These include, but are not limited to:

- Secondary containment for containers with a capacity of 100 gallons or more.
- All spills must be immediately reported to RVAAP.
- Spill response must comply with the current Installation Spill Contingency Plan for the Ravenna Army Ammunition Plant.

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10.0 SITE CONTROL MEASURES

The SSHO will be responsible for establishing the site control zones, as necessary, around Contractor-controlled areas that present physical or chemical hazards. Implementation of the site control zones will help to minimize the number of employees potentially exposed and to minimize the potential for the spread of contamination. The SSHO will monitor the implementation of the required site control work rules and will report any deviations from prescribed practice to the Field Operations Manager or Task Leader or stop work, as appropriate.

Site control zones will be established in multiple locations over the site. The exact locations will vary depending on site conditions; therefore, it is not possible to predetermine the size or exact locations of site control zones. As a general rule, an exclusion zone will be established around any task or area that poses a potential to spread contamination or injure personnel. Examples of tasks or areas that will require site control include drilling/excavation sites, areas of known contamination, etc.

10.1 EXCLUSION ZONE

The exclusion (contamination) zone is the area where the greatest potential exists for exposure to contamination or physical hazards. The periphery of the exclusion zone will be identified by barricade tape or rope suspended above the ground. An entry and exit checkpoint will be visually defined to regulate the flow of personnel and equipment. The entry and exit checkpoint will be delineated with barricade tape/rope and signs. Signs may include "Construction Area," or "High Noise Area," as deemed appropriate by the SSHO. The number of people and equipment in the exclusion zone will be minimized to control physical hazards and the spread of contamination.

The following standard rules will apply to all entry into the exclusion zone.

- The SSHO or Field Task Leader must approve (and log) entry into the exclusion zone.
- All personnel entering the exclusion zone will wear the prescribed level of protective clothing.
- All items and related paraphernalia intended to be placed on the face or in the mouth (cigarettes, lighters, matches, chewing tobacco, food, cosmetics, etc.) are prohibited in the exclusion zone.
- All personnel in the exclusion zone will follow the buddy system.

Exclusion zones will be established around drilling sites, areas of heavy equipment use, and all activities where contamination is a potential hazard. As a minimum, the exclusion zone will extend 25 feet from the hazard. For drilling operations, the exclusion zone will also be at least equal to the mast height in radius so that no part of an overturned drill rig will fall outside the zone. A larger exclusion zone will be used, as necessary, to protect bystanders and the public from chemical or other hazards. Exclusion zones for other activities will be appropriate to the hazard and surroundings.

10.2 CONTAMINATION REDUCTION ZONE

A contamination reduction (buffer) zone will be established, as necessary, outside the exclusion zone to provide a transition from and a buffer between the exclusion zone and the support zone. A formal

contamination reduction zone for personnel will not be established unless Level D+ PPE or higher level (A, B, C) is used, or significant surface contamination is present or suspected. An entry and exit checkpoint will be visually defined at the periphery of the zone to regulate the flow of personnel and equipment. The entry and exit checkpoint and the perimeter of the zone will be delineated with the use of ropes/barricade tape and signs. A contamination reduction zone will be established around the central equipment decontamination pad.

All personnel entering the contamination reduction zone will wear the prescribed level of protective clothing required for that zone. All items intended to be placed on the face or in the mouth (e.g., cigarettes, chewing tobacco, food, cosmetics, etc.) are prohibited in the contamination reduction zone. Doffing of protective clothing and personnel decontamination will occur in the contamination reduction zones.

10.3 SUPPORT ZONE

The support zone is the clean and relatively safe area surrounding the exclusion and contamination reduction zones. Entry requirements for the support zone consist of those required for entry into the general area of the facility. Primary functions of the support zone are:

- staging area for clean equipment and supplies; and
- location for support services [e.g., office trailers, laboratory trailers, eating area(s), toilet facilities, parking, visitor area(s), etc.].

10.4 SITE VISITORS

Visitors will not be allowed inside areas controlled by the Contractor without specific approval of the SSHO and Field Manager. Visitors must meet all regulatory (specifically 29 *CFR* 1910.120) and site H&S requirements (proof of training, medical surveillance, etc.) to be considered for entry into an exclusion or contamination reduction zone. Visitors will sign in on the site entry log and will receive a health and safety briefing appropriate to the nature of the visit and the potential hazards associated with the visit.

10.5 SITE COMMUNICATION

Field personnel will be capable of contacting other field personnel and outside agencies. Communication on-site will be assured by hand-held radio, portable air horns, or vehicle horns. Short blasts (less than 1/2 second) of an air horn or car horn will be used to request assistance. Prolonged blasts (more than 2 seconds) will be used to signal an evacuation. If phone service is not immediately available on the site, the crew will be equipped with a cellular phone.

11.0 PERSONNEL HYGIENE AND DECONTAMINATION

A system of procedures will be used to control the spread of contamination from the exclusion (contamination) zone and to ensure that workers are sufficiently free of contamination to preclude adverse health effects. PPE doffing and personnel decontamination are part of this system. The SSHO will ensure the construction of a decontamination station, as necessary, instruct personnel on its proper use, and verify that personnel follow the appropriate steps. This section presents basic requirements for personnel decontamination keyed to the level of protective clothing in use. Note that the levels of protective clothing required for particular tasks are specified in the Hazards Analysis Table (Table 2-2). These requirements may be modified by the SSHO if improvements are needed.

11.1 LEVEL D PROTECTION DECONTAMINATION

Station 1: Removal of disposable gloves and boot covers, if worn

Deposit disposable gloves and boot covers in a designated container. Note that this step is necessary only if gloves and boot covers are in use.

Station 2: Field wash

Wash face and hands prior to taking anything by mouth. This may be done with soap and water or disposable disinfectant towels.

11.2 LEVEL D+ PROTECTION DECONTAMINATION

Station 1: Tape removal

Remove all tape (if used) from outer clothing and place in appropriate waste container.

Station 2: Boot covers, outer disposable garment, and gloves removal

Carefully remove boot covers, outer contamination-resistant garment, and gloves.

Station 3: Field wash

Wash hands and face prior to eating, drinking, smoking, etc. This step may be accomplished with soap and water or disposable disinfectant wipes.

11.3 LEVEL C PROTECTION DECONTAMINATION

Station 1: Segregated equipment drop

Deposit equipment used on-site (tools, sampling devices, containers, monitoring instruments, clipboards, etc.) on plastic sheets or in different containers with plastic liners. Segregation of the equipment at the drop site reduces the possibility of cross-contamination.

Station 2: Outer boot and glove removal

Remove tape from outer boots and outer gloves. Remove outer boot covers and outer gloves. Deposit gloves and boot covers in plastic trash bags.

Station 3: Cartridge change

If a worker has left the exclusion zone for the sole purpose of changing a canister/cartridge of the respirator, this is the last step of the decontamination procedure. Once the worker's canister/cartridge has been replaced, the outer boots and gloves will be replaced and retaped so that all potential pathways to the skin are sealed.

Station 4: Disposable outer garment removal

Remove disposable outer garment, deposit in a plastic trash bag, and dispose in accordance with the project Field Sampling Plan.

Station 5: Respiratory protection and disposable inner glove removal

The respirator is the next-to-last item for removal. The cartridges/canisters are placed in a plastic trash bag and disposed of in accordance with the project Field Sampling Plan. The respirator is placed in a plastic bag dedicated for used respirators only. Remove disposable inner gloves last and deposit them in a plastic trash bag, in accordance with the project Field Sampling Plan.

Station 6: Field wash

Wash hands and face prior to eating, drinking, smoking, etc. This step may be accomplished with soap and water or disposable disinfectant wipes.

12.0 EMERGENCY PROCEDURES AND EQUIPMENT

The Contractor must establish sufficient emergency procedures and equipment to allow a safe and effective response to credible emergencies. If an emergency occurs, the Field Operations Manager or Task Leader, the SSHO, and the field team will participate in a post-emergency briefing to discuss the event, identify the causes, identify corrective measures, and evaluate the responses.

In the event of an accident or incident, the Field Operations Manager or Task Leader must first notify RVAAP's security personnel, who will, in turn, contact the proper authorities. The field supervisor should then notify the U.S. Army Project Manager immediately according to the requirements of EM 385-1-1. The required Accident Report (ENG Form 3394) must be completed and submitted to the U.S. Army Project Manager within two days.

All personnel working on-site will be trained in the applicable emergency response requirements. This will include recognizing emergencies, reporting emergencies to the Field Operations Manager or Task Leader or SSHO, and responding to emergencies. Employees will also be informed of any changes in potential emergencies or response plans.

12.1 POTENTIAL EMERGENCIES

Credible potential emergencies for this project include fires, minor chemical spills, and personnel injury.

12.1.1 Fires

Small quantities of flammable solvents [typically less than 18.9 liters (5 gallons)], gasoline, and diesel fuel may be present on-site. In the event of a fire, the local fire department will be notified immediately. If it is safe to do so, on-site personnel may attempt to extinguish the fire with the available fire extinguishers and isolate any nearby flammable materials. If there is any doubt about the safety of extinguishing the fire, site personnel will evacuate the area. The supervisor or knowledgeable employee will provide the fire department with relevant information when they arrive.

12.1.2 Spills

Potential spills include releases of fuels, lubricants, hydraulic fluids, and decontamination solvents. In the event of a spill or leak, the employee making the discovery will immediately notify the SSHO and/or the Field Operations Manager or Task Leader. The Field Operations Manager or Task Leader will determine whether the leak poses an environmental risk or will exceed the capacity of on-site personnel and equipment. In the unlikely event that there is a probability that the spill will extend beyond the immediate area, result in an environmental insult, or exceed the capabilities of the on-site personnel, the Field Operations Manager or Task Leader will inform the local fire department and hazardous materials response team. If this is not the case, the on-site spill kit will be utilized to clean up the spill.

12.1.3 Medical Emergencies

Field crews will use a variety of equipment that could cause injuries. In the event of a medical emergency, the Field Operations Manager or Task Leader will notify the local emergency medical service immediately. At least two first aid/cardiopulmonary resuscitation (CPR)-trained individuals will be on site at all times and these personnel will provide first aid pending release of the injured person to

emergency medical staff. Contaminated injured personnel will be decontaminated to the extent feasible. Personnel with minor injuries will follow normal decontamination procedures. Personnel with serious injuries will be decontaminated, if necessary, by disrobing and wrapping in a blanket. Decontamination may be bypassed in the event of life-threatening injuries or illnesses.

12.2 EMERGENCY PHONE NUMBERS

Listed below are emergency groups and their telephone numbers. A telephone and 2-way radio will be present in the field and available for use. Tol-Test Co., Inc. will be contacted first for any emergency service. Tol-Test Co., Inc. will then coordinate the response.

At least one person (i.e., project manager or Field Operations Manager) must have a working 2-way radio on the RVAAP frequency. The radio must be tested each morning before the start of work, by radioing Security with a communication check. Each team must have direct radio or telephone communication with the Project Manager or Field Operations Manager. For the purposes of this requirement, a team is any individual(s) not having a line of sight or within normal voice range of another individual(s) having means of communication with the Field Operations Manager.

Emergency Group	Telephone No.
Police (Tol-Test Inc./Mid-American Security)	330-338-7406 Pager: 261-626-0825
Emergency medical service (Borowski Funeral Home, Ravenna)	330-872-5050
Hospital (Robinson Memorial, Ravenna)	330-297-2449/0811
Fire department (City of Ravenna)	330-297-5738
Hazardous materials response (Tol-Test Co., Inc.)	330-358-7406/7409
RVAAP Environmental Coordinator	330-358-7311

Robinson Memorial Hospital is located approximately 32 km (20 miles) from the site at 6847 N. Chestnut Street in Ravenna, Ohio. It can be reached by taking Highway 5 E. approximately 11 km (7 miles), Highway 5 approximately 3.2 km (2 miles), Highway 59, then right onto Highway 44 (Chestnut Street).

12.3 EMERGENCY ALERTING

Each team will have a means for generating an audible alarm, which will consist of a compressed gas horn or vehicle horn. These devices will be used to signal to other project personnel in the event of accidents or emergencies. Short blasts (less than 1/2 second) of the horn will be used to request assistance, while extended blasts (more than 2 seconds) will signal an evacuation.

12.4 EVACUATION

The SSO or Field Operations Manager or Task Leader will designate the evacuation routes and an assembly area. All employees will be familiar with the evacuation routes and assembly area.

12.5 EMERGENCY EQUIPMENT

Several items of emergency equipment will be maintained at the work site. Any incident that is not clearly controllable by personnel wearing standard site clothing plus protective gloves and using the listed

equipment will require reevaluation by the SSHO. If the SSHO does not feel that on-site personnel can safely control the emergency with the available equipment, the crew will use an alternate approach such as allowing a small fire to burn out or evacuating the site. The required emergency equipment includes:

- fully stocked first aid kit indoors or in weatherproof container, inspected weekly;
- compressed gas horns;
- emergency eye wash to meet American National Standards Institute standard if corrosives (water sample preservatives) are being poured;
- fire extinguisher(s) (at least 20-B) 7.6 to 22.9 meters (25 to 75 feet) from outside flammables storage (or use) area;
- basic spill kit suitable to handle small spills of decontamination fluids, hydraulic fluid, or fuels and containing sorbent pads, tubes, and nitrile or similar gloves; and
- telephone and 2-way radios.

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13.0 LOGS, REPORTS, AND RECORD KEEPING

A system of reports and logs will be used to document activities related to site Health and Safety. Field team leaders and the SSHO will generate a brief weekly summary of Health and Safety issues and resolutions. These reports will include injuries, accidents, near accidents, interpretations of the FSHP or regulations, interactions with auditors/regulators/U.S. Army personnel, and any off-normal events. These reports will be limited to one page or less.

In addition to the weekly reports, the following documents will be generated and submitted to the U.S. Army Project Manager.

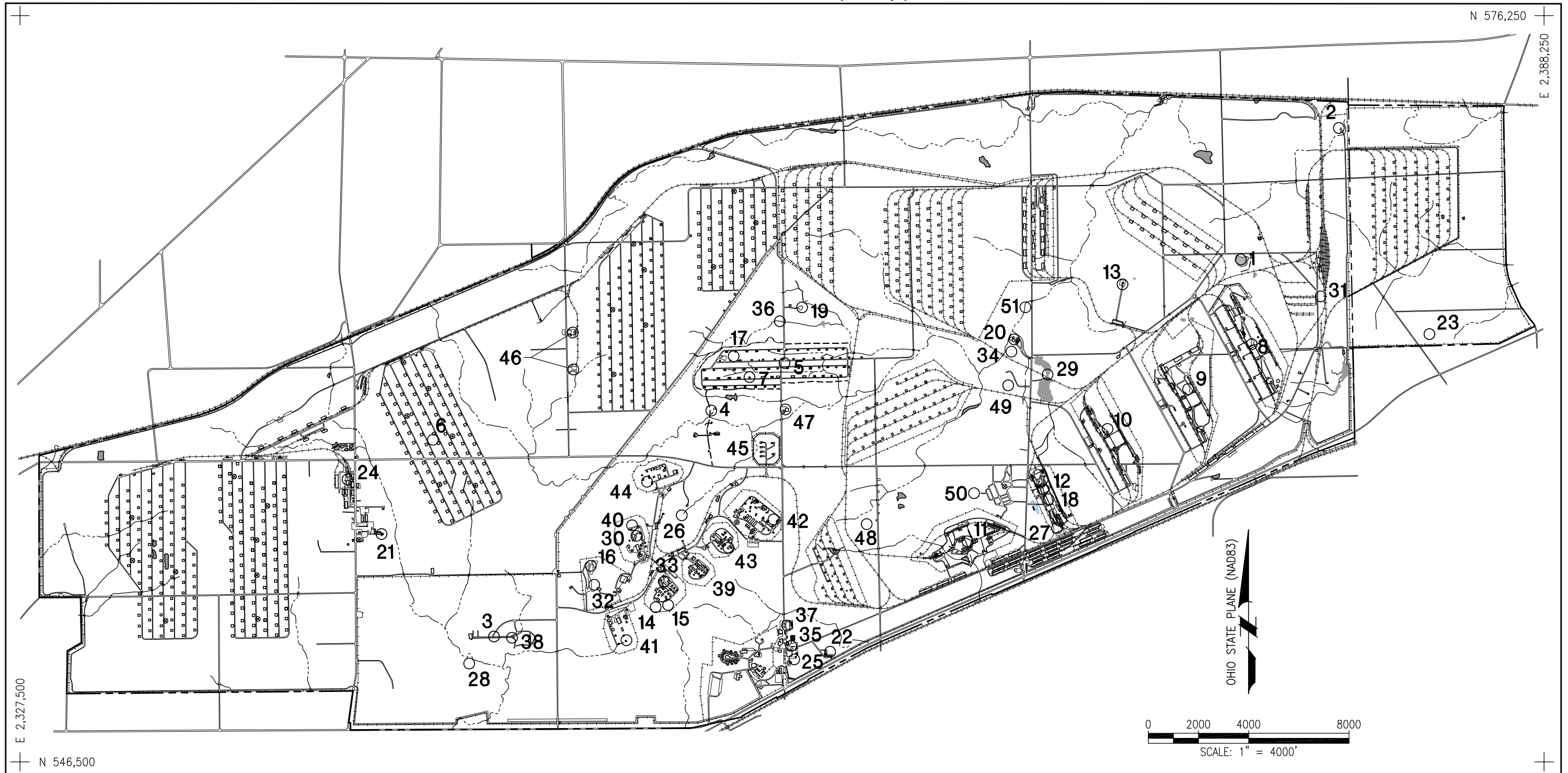
- Training logs will contain information covered and the signatures of the trainer and those attending. These logs will contain documentation of pre-entry (project start) training, routine (“tailgate”) safety briefings, and visitor training.
- Daily safety inspection logs will contain the dates of inspections, identity of the person doing the inspection, the examined areas/activities/equipment, any deficiencies, and any corrective actions taken.
- Equipment maintenance logs will contain the dates and types of routine maintenance performed on site equipment.
- Employee/visitor register will be a sign-in log for all site employees and visitors. It will contain the names of all personnel who perform on-site work or visit the site. It will not contain the names of delivery or similar personnel.
- Environmental and personal exposure monitoring/sampling results will be maintained in a log that will contain monitoring data, location and time of monitoring, types of work being done, calibration records, and the identities of personnel performing monitoring.

Sample reporting forms are included in Appendix C.

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APPENDIX A
SITE MAP

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LEGEND OF SITES:

1 RAMSDALL QUARRY LANDFILL	13 BLDG 1200 AND DILUTION/SETTLING POND	25 BLDG 1034 MOTOR POOL WASTE OIL TANK	37 PESTICIDE STORAGE BUILDING T-4452	49 CENTRAL BURN PITS
2 ERIE BURNING GROUNDS	14 LOAD LINE 6, EVAPORATION UNIT	26 FUZE BOOSTER AREA SETTLING TANKS	38 NACA TEST AREA	50 ATLAS SCRAP YARD
3 DEMOLITION AREA 1	15 LOAD LINE 6, TREATMENT PLANT	27 BLDG 854-PCB STORAGE	39 LOAD LINE 5 / FUZE LINE 1	51 DUMP ALONG PARIS-WINDHAM ROAD
4 DEMOLITION AREA 2	16 QUARRY LANDFILL/FORMER FUZE & BOOSTER BURNING PITS	28 MUSTARD AGENT BURIAL SITE	40 LOAD LINE 7 / BOOSTER LINE 1	○ CERCLA
5 WINKLEPECK BURNING GROUNDS	17 DEACTIVATION FURNACE	29 UPPER AND LOWER COBBS POND COMPLEX	41 LOAD LINE 8 / BOOSTER LINE 2	○ RCRA
6 C BLOCK QUARRY	18 LOAD LINE 12 PINK WASTE WATER TREATMENT	30 LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT	42 LOAD LINE 9 / DETONATOR LINE	○ OTHER REGULATORY
7 BLDG 1601 HAZARDOUS WASTE STORAGE	19 LANDFILL NORTH OF WINKLEPECK BURNING GROUND	31 ORE PILE RETENTION POND	43 LOAD LINE 10 / PERCUSSION ELEMENT	
8 LOAD LINE 1 AND DILUTION/SETTLING POND	20 SAND CREEK SEWAGE TREATMENT PLANT	32 40- AND 60-MM FIRING RANGE	44 LOAD LINE 11 / ARTILLERY PRIMER	
9 LOAD LINE 2 AND DILUTION/SETTLING POND	21 DEPOT SEWAGE TREATMENT PLANT	33 FIRESTONE TEST FACILITY	45 WET STORAGE AREA	
10 LOAD LINE 3 AND DILUTION/SETTLING POND	22 GEORGE ROAD SEWAGE TREATMENT PLANT	34 SAND CREEK DISPOSAL ROAD LANDFILL	46 BUILDINGS F-15 AND F-16	
11 LOAD LINE 4 AND DILUTION/SETTLING POND	23 UNIT TRAINING SITE WASTE OIL TANK	35 1037 BUILDING-LAUNDRY WASTEWATER SUMP	47 BUILDING T-5301 DECONTAMINATION	
12 LOAD LINE 12 AND DILUTION/SETTLING POND	24 RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK	36 PISTOL RANGE	48 ANCHOR TEST AREA	


U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 Louisville District
 LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT
 RAVENNA, OHIO
 FACILITY MAP

DRAWN BY: R. BEELER	REV. NO./DATE: REV. 0 / 03-14-01	CAD FILE: /99035/DWGS/L70RVAP2
------------------------	-------------------------------------	-----------------------------------

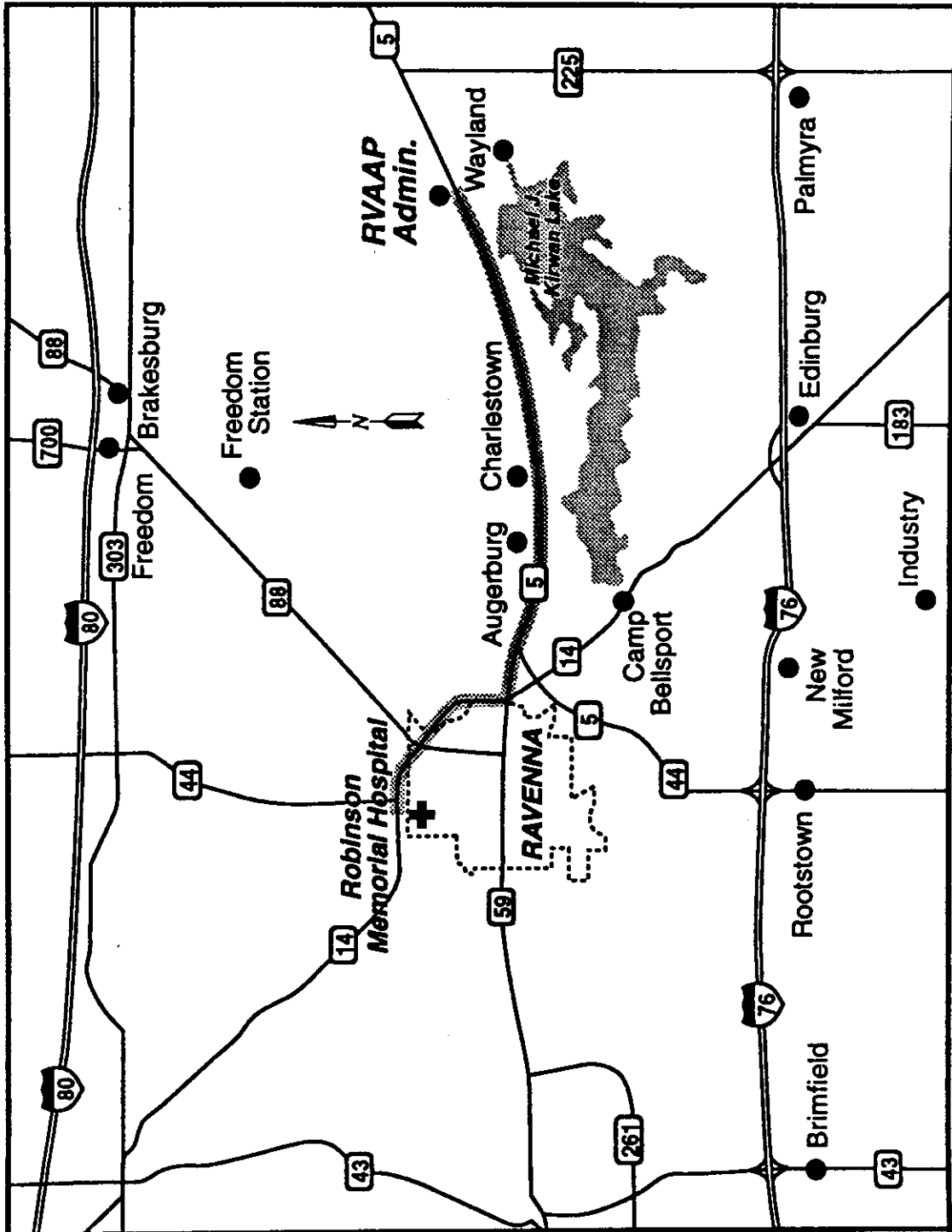
Fig. A-1. RVAAP Installation Map

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APPENDIX B

ROUTE MAP TO PRE-NOTIFIED MEDICAL FACILITY

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COE NASH RV 031

Figure B-1. Route Map to Pre-Notified Medical Facility

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APPENDIX C
REPORTING FORMS

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Bureau of Labor Statistics
 Log and Summary of Occupational
 Injuries and Illnesses

NOTE: This form is required by Public Law 91-596 and must be kept in the establishment for 5 years. Failure to maintain and post can result in the issuance of citations and assessments of penalties. (See posting requirements on the other side of form.)

RECORDABLE CASES: You are required to record information about every occupational death, every nonfatal occupational illness, and those nonfatal occupational injuries which involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment (other than first aid). (See definitions on the other side of form.)

Case or File Number Enter a nonduplicating number which will facilitate comparisons with supplementary records. (A)	Date of Injury or Onset of Illness Enter Mo./day. (B)	Employee's Name Enter first name or initial, middle initial, last name. (C)	Occupation Enter regular job title, not activity employee was performing when injured or at onset of illness. In the absence of a formal title, enter a brief description of the employee's duties. (D)	Department Enter department in which the employee is regularly employed or a description of normal workplace to which employee is assigned, even though temporarily working in another department at the time of the injury or illness (E)	Description of Injury or Illness Enter a brief description of the injury or illness and indicate the part or parts of body affected. Typical entries for this column might be: Amputation of 1 st joint right forefinger; Strain of lower back; Contact dermatitis on both hands; Electrocution—body. (F)
					PREVIOUS PAGE TOTALS
					TOTALS (Instructions on other side of form)

DAILY SAFETY INSPECTION

PROJECT: _____ Page 1 of 2

N	Y	NA	Item
			Daily safety briefing conducted
			Emergency numbers and route to hospital posted
			SSHP onsite, available to employees, and complete
			Required exposure monitoring conducted and documented
			Monitoring instruments (PID, OVA, CGI) calibrated daily against known standard and documented
			First aid kit available and inspected weekly
			Personnel wearing PPE required by SSHP for field work (at least safety shoes or boots, safety glasses with side shields, and nitrile or similar gloves to handle potentially contaminated material)
			Personnel using buddy system (maintain visual or verbal contact and able to render aid)
			If temperature >70°F: heat stress training conducted, cool fluids available, pulse rates of personnel wearing Tyvek are being monitored, work/rest cycle in SSHP being followed
			If temperature <40°F: cold stress training conducted, controls in SSHP implemented
			Personnel using appropriate biological hazard controls (See SSHP)
			Drill rig operating manual on site
			Drill rigs inspected weekly and documented
			Personnel near drill rig or other overhead hazards wearing hardhats
			Each of two drill rig kill switches tested daily
			Employees excluded from under lifted loads
			Unnecessary personnel excluded from hazardous areas, specifically near drill rigs
			Radius of exclusion zone around drill rig at least equal to mast height
			Personnel wearing hearing protection when within 25 feet of drill rigs, generators, or other noisy equipment
			Containers of flammable liquids closed and labeled properly
			Fully charged fire extinguisher available 25 to 50 feet from flammables storage area and inspected monthly
			Personnel exiting potentially contaminated areas washing hands and face before eating
			Personnel using steam washer wearing faceshield, hearing protection, heavy duty waterproof gloves, Saranax or rainsuit

DAILY SAFETY INSPECTION

PROJECT: _____ Page 2 of 2

			Portable electrical equipment double insulated or plugged to a GFCI
			Electrical wiring covered by insulation or enclosure
			Three wire, UL approved, extension cords used
			Housekeeping adequate (walkways clear of loose, sharp or dangerous objects and trip hazards, work areas clear of objects that might fall on employees)
			Walking/working surfaces safe (not slippery, no unguarded holes, no trip hazards)
			Excavations deeper than 5 feet shored or sloped (if personnel will enter) and in compliance with SSHP
			Moving (rotating) machinery guarded to prevent employee contact
			Fall protection provided for work at elevations greater than 4 feet
			All containers of hazardous material labeled to indicate contents and hazards
			MSDSs for hazardous materials on site
			If work is conducted in areas open to hunting (and during season) high visibility vests and other alerting systems such as lights, noise devices (radios) in use
			15-minute eyewash (accessible and full) within 100 feet of areas where corrosive sample preservatives are poured
			Potable and non-potable water labeled
			Chainsaws have anti kick-back protection, personnel wearing cut resistant gloves, protective chaps
			Visitor access controlled
			Site hazards and controls consistent with SSHP
			Site hazard controls appropriate and sufficient

Actions taken to correct or control any "N" responses

Name _____ Signature _____ Date _____

DAILY HEALTH AND SAFETY SUMMARY
PROJECT NAME: PROJECT NO:

NAME: DATE: M Tu W Th F Sa Su TIME:

TASKS PERFORMED:

OFF-NORMAL EVENTS:

1 ACCIDENT CLASSIFICATION				
PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT <input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CONTRACTOR	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> PUBLIC	<input type="checkbox"/> FATAL <input type="checkbox"/> OTHER	XXXXXXXXXX	<input type="checkbox"/>	XXXXXXXXXX

2 PERSONAL DATA				
a. NAME <i>(Last,First,MI)</i>	b. AGE	c. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	d. SOCIAL SECURITY NUMBER ____/____/____	e. GRADE
f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ON DUTY <input type="checkbox"/> TDY <input type="checkbox"/> OFF DUTY		i. EMPLOYMENT STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ARMY ACTIVE <input type="checkbox"/> ARMY RESERVE <input type="checkbox"/> VOLUNTEER <input type="checkbox"/> PERMANENT <input type="checkbox"/> FOREIGN NATIONAL <input type="checkbox"/> SEASONAL <input type="checkbox"/> TEMPORARY <input type="checkbox"/> STUDENT <input type="checkbox"/> OTHER <i>(Specify)</i> _____	

3 GENERAL INFORMATION			
a. DATE OF ACCIDENT <i>(month/day/year)</i>	b. TIME OF ACCIDENT <i>(Military time)</i>	c. EXACT LOCATIONS OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME (2) SUBCONTRACTOR
e. CONTRACT NUMBER <input type="checkbox"/> CIVIL WORKS <input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER <i>(Specify)</i>		f. TYPE OF CONTRACT <input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> SERVICE <input type="checkbox"/> A/E <input type="checkbox"/> DREDGE <input type="checkbox"/> OTHER <i>(Specify)</i> _____	g. HAZARDOUS/TOXIC WASTE ACTIVITY <input type="checkbox"/> SUPERFUND <input type="checkbox"/> DERP <input type="checkbox"/> IRP <input type="checkbox"/> OTHER <i>(Specify)</i> _____

4 CONSTRUCTION ACTIVITIES ONLY <i>(Fill in line and corresponding code number in box from list - see instructions)</i>	
a. CONSTRUCTION ACTIVITY _____ (CODE) # <input style="width:40px;" type="text"/>	b. TYPE OF CONSTRUCTION EQUIPMENT _____ (CODE) # <input style="width:40px;" type="text"/>

5 INJURY/ILLNESS INFORMATION <i>(Include name on line and corresponding code number in box for items e, f, & g - see instructions)</i>			
a. SEVERITY OF ILLNESS/INJURY _____ (CODE) # <input style="width:40px;" type="text"/>	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY
e. BODY PART AFFECTED PRIMARY _____ (CODE) # <input style="width:40px;" type="text"/> SECONDARY _____ (CODE) # <input style="width:40px;" type="text"/>	g. TYPE AND SOURCE OF INJURY/ILLNESS TYPE _____ (CODE) # <input style="width:40px;" type="text"/> SOURCE _____ (CODE) # <input style="width:40px;" type="text"/>		
f. NATURE OF ILLNESS/INJURY _____ (CODE) # <input style="width:40px;" type="text"/>			

6 PUBLIC FATALITY <i>(Fill in line and corresponding code number in box - see instructions)</i>	
a. ACTIVITY AT TIME OF ACCIDENT _____ (CODE) # <input style="width:40px;" type="text"/>	b. PERSONAL FLOTATION DEVICE USED? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A

7 MOTOR VEHICLE ACCIDENT			
a. TYPE OF VEHICLE <input type="checkbox"/> PICKUP/VAN <input type="checkbox"/> AUTOMOBILE <input type="checkbox"/> TRUCK <input type="checkbox"/> OTHER <i>(Specify)</i>	b. TYPE OF COLLISION <input type="checkbox"/> SIDE SWIPE <input type="checkbox"/> HEAD ON <input type="checkbox"/> REAR END <input type="checkbox"/> BROADSIDE <input type="checkbox"/> ROLL OVER <input type="checkbox"/> BACKING <input type="checkbox"/> OTHER <i>(Specify)</i> _____	c. SEAT BELTS	USED NOT USED NOT AVAILABLE (1) FRONT SEAT (2) REAR SEAT

8 PROPERTY/MATERIAL INVOLVED		
a. NAME OF ITEM (1) _____ (2) _____ (3) _____	b. OWNERSHIP	c. \$ AMOUNT OF DAMAGE

9 VESSEL/FLOATING PLANT ACCIDENT <i>(Fill in line and corresponding code number in box from list. See instructions)</i>	
a. TYPE OF VESSEL/FLOATING PLANT _____ (CODE) # <input style="width:40px;" type="text"/>	b. TYPE OF COLLISION/MISHAP _____ (CODE) # <input style="width:40px;" type="text"/>

10 ACCIDENT DESCRIPTION <i>(Use additional paper, if necessary)</i>

11 CAUSAL FACTOR(S) (Read Instruction Before Completing)					
<p>a. (Explain YES answers in item 13)</p> <p>DESIGN Was design of facility workplace or equipment a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>INSPECTION MAINTENANCE Were inspection and maintenance procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>PERSON'S PHYSICAL CONDITION In your opinion, was the physical condition of the person a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>OPERATING PROCEDURES Were operating procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>JOB PRACTICES Were any job safety/health practices not followed when the accident occurred? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>HUMAN FACTORS Did any human factors such as size or strength of person, etc. contribute to accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>ENVIRONMENTAL FACTORS Did heat, cold, dust, sun, glare, etc. contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>			<p>a. (CONTINUED)</p> <p>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? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>OFFICE FACTORS Did office setting such as lifting office furniture, carrying, stooping, etc. contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>SUPPORT FACTORS Were inappropriate tools/resources provided to properly perform the activity/task? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>PERSONAL PROTECTIVE EQUIPMENT Did the improper selection, use, or maintenance of personal protective equipment contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>DRUGS/ALCOHOL In your opinion was drugs or alcohol a factor to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>		
<p>b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT? <input type="checkbox"/> YES (If yes, attach a copy) <input type="checkbox"/> NO</p>					

12 TRAINING		
<p>a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>b. TYPE OF TRAINING <input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB</p>	<p>c. DATE OF MOST RECENT FORMAL TRAINING (Month) / (Day) / (Year)</p>

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 SYMBOL
CORPS _____		___ / ___ / ___			
SUBCONTRACTOR _____		___ / ___ / ___			

16 MANAGEMENT REVIEW (1st)		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. COMMENTS
SIGNATURE	TITLE	DATE

17 MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. COMMENTS
SIGNATURE	TITLE	DATE

18 SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. ADDITIONAL ACTIONS/COMMENTS
SIGNATURE	TITLE	DATE

19 COMMAND APPROVAL	
COMMENTS	
COMMANDER SIGNATURE	DATE

GENERAL. Complete a separate report for each person who was *injured, caused, or contributed* to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA Commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16 and 17.

INSTRUCTIONS FOR SECTION 1 — ACCIDENT CLASSIFICATION. (Mark All Boxes That Are Applicable.)

- a. **GOVERNMENT.** Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.
 - (1) **INJURY/ILLNESS/FATALITY**— Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.
 - (2) **PROPERTY DAMAGE**—Mark the appropriate box if accident resulted in any damage of \$1000 or more to government property (including motor vehicles).
 - (3) **VEHICLE INVOLVED**—Mark if accident involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) **DIVING ACTIVITY**—Mark if the accident involved an in-house USACE diving activity.
- b. **CONTRACTOR.**
 - (1) **INJURY/ILLNESS/FATALITY**—Mark if accident resulted in any contractor lost-time injury/illness or fatality.
 - (2) **PROPERTY DAMAGE**—Mark the appropriate box if accident resulted in any damage of \$1000 or more to contractor property (including motor vehicles).
 - (3) **VEHICLE INVOLVED**—Mark if accident involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) **DIVING ACTIVITY**—Mark if the accident involved a USACE Contractor diving activity.
- c. **PUBLIC.**
 - (1) **INJURY/ILLNESS/FATALITY**—Mark if accident resulted in public fatality or permanent total disability. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).
 - (2) **VOID SPACE**—Make no entry.
 - (3) **VEHICLE INVOLVED**—Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" is marked.
 - (4) **VOID SPACE**—Make no entry.

INSTRUCTIONS FOR SECTION 2 — PERSONAL DATA

- a. **NAME**—(MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.
- b. **AGE**—Enter age.
- c. **SEX**—Mark appropriate box.
- d. **SOCIAL SECURITY NUMBER**—(FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).
- e. **GRADE**—(FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: 0-6; E-7; WG-8; WS-12; GS-11; etc.
- f. **JOB SERIES/TITLE**—For *government civilian employees* enter the pay plan, full series number, and job title, e.g., GS-0810/Civil

Engineer. For *military personnel* enter the primary military occupational specialty (PMOS), e.g., 15A40 or 11G50. For *contractor employees* enter the job title assigned to the injured person, e.g., carpenter, laborer, surveyor, etc.

- g. **DUTY STATUS**—Mark the appropriate box.
 - (1) **ON DUTY**—Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.
 - (2) **TDY**—Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.
 - (3) **OFF DUTY**—Person was not on official business at time of accident.
- h. **EMPLOYMENT STATUS**—(FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTIONS FOR SECTION 3 — GENERAL INFORMATION

- a. **DATE OF ACCIDENT**—Enter the month, day, and year of accident.
- b. **TIME OF ACCIDENT**—Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).
- c. **EXACT LOCATION OF ACCIDENT**—Enter facts needed to locate the accident scene (installation/project name, building number, street, direction, and distance from closest landmark, etc.).
- d. **CONTRACTOR NAME**
 - (1) **PRIME**—Enter the exact name (title of firm) of the prime contractor.
 - (2) **SUBCONTRACTOR**—Enter the name of any subcontractor involved in the accident.
- e. **CONTRACT NUMBER**—Mark the appropriate box to identify if contract is civil works, military, or other: if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.
- f. **TYPE OF CONTRACT**—Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
- g. **HAZARDOUS/TOXIC WASTE ACTIVITY (HTW)**—Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUDS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 — CONSTRUCTION ACTIVITIES

- a. **CONSTRUCTION ACTIVITY**—Select the *most appropriate* construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

- | | |
|-------------------------|----------------------------|
| 1. MOBILIZATION | 14. ELECTRICAL |
| 2. SITE PREPARATION | 15. SCAFFOLDING/ACCESS |
| 3. EXCAVATION/TRENCHING | 16. MECHANICAL |
| 4. GRADING (EARTHWORK) | 17. PAINTING |
| 5. PIPING/UTILITIES | 18. EQUIPMENT/MAINTENANCE |
| 6. FOUNDATION | 19. TUNNELING |
| 7. FORMING | 20. WAREHOUSING/STORAGE |
| 8. CONCRETE PLACEMENT | 21. PAVING |
| 9. STEEL ERECTION | 22. FENCING |
| 10. ROOFING | 23. SIGNING |
| 11. FRAMING | 24. LANDSCAPING/IRRIGATION |
| 12. MASONRY | 25. INSULATION |
| 13. CARPENTRY | 26. DEMOLITION |

b. TYPE OF CONSTRUCTION EQUIPMENT—Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER," and write in specific type of equipment.

CONSTRUCTION EQUIPMENT

- | | |
|---------------------------------------|-----------------------------------|
| 1. GRADER
HIGHWAY) | 13. DUMP TRUCK (OFF |
| 2. DRAGLINE | 14. TRUCK (OTHER) |
| 3. CRANE (ON VESSEL/BARGE) | 15. FORKLIFT |
| 4. CRANE (TRACKED) | 16. BACKHOE |
| 5. CRANE (RUBBER TIRE) | 17. FRONT-END LOADER |
| 6. CRANE (VEHICLE MOUNTED) | 18. PILE DRIVER |
| 7. CRANE (TOWER) | 19. TRACTOR (UTILITY) |
| 8. SHOVEL | 20. MANLIFT |
| 9. SCRAPER | 21. DOZER |
| 10. PUMP TRUCK (CONCRETE) | 22. DRILL RIG |
| 11. TRUCK (CONCRETE/TRANSIT
MIXER) | 23. COMPACTOR/VIBRATORY
ROLLER |
| 12. DUMP TRUCK (HIGHWAY) | 24. OTHER |

INSTRUCTIONS FOR SECTION 5—INJURY/ILLNESS INFORMATION

a. SEVERITY OF INJURY/ILLNESS—Reference para 2-10 of USACE Suppl 1 to AR 385-40 and enter code and description from list below.

- | | |
|-----|---|
| NOI | NO INJURY |
| FAT | FATALITY |
| PTL | PERMANENT TOTAL DISABILITY |
| PPR | PERMANENT PARTIAL DISABILITY |
| LWD | LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK |
| NLW | RECORDABLE CASE WITHOUT LOST WORKDAYS |
| RFA | RECORDABLE FIRST AID CASE |
| NRI | NON-RECORDABLE INJURY |

- b. ESTIMATED DAYS LOST—Enter the estimated number of workdays the person will lose from work.
- c. ESTIMATED DAYS HOSPITALIZED—Enter the estimated number of workdays the person will be hospitalized.
- d. ESTIMATED DAYS RESTRICTED DUTY—Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.
- e. BODY PART AFFECTED—Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREASTS
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	CB	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW

ELBOW

FINGER

TOE

HEAD, EXTERNAL

KNEE

LEG, HIP, ANKLE,
BUTTOCK

HAND

FOOT

TRUNK, BONES

SHOULDER

THUMB

TRUNK, INTERNAL ORGANS

- | | |
|----|---------------------|
| CL | THROAT, LARYNX |
| CM | MOUTH |
| CN | NOSE |
| CR | THROAT, OTHER |
| CT | TONGUE |
| CZ | HEAD OTHER INTERNAL |

- | | |
|----|--------------|
| EB | BOTH ELBOWS |
| ES | SINGLE ELBOW |

- | | |
|----|---------------------|
| F1 | FIRST FINGER |
| F2 | BOTH FIRST FINGERS |
| F3 | SECOND FINGER |
| F4 | BOTH SECOND FINGERS |
| F5 | THIRD FINGER |
| F6 | BOTH THIRD FINGERS |
| F7 | FOURTH FINGER |
| F8 | BOTH FOURTH FINGERS |

- | | |
|----|-----------------|
| G1 | GREAT TOE |
| G2 | BOTH GREAT TOES |
| G3 | TOE OTHER |
| G4 | TOES OTHER |

- | | |
|----|--------------------|
| H1 | EYE EXTERNAL |
| H2 | BOTH EYES EXTERNAL |
| H3 | EAR EXTERNAL |
| H4 | BOTH EARS EXTERNAL |
| HC | CHIN |
| HF | FACE |
| HK | NECK/THROAT |
| HM | MOUTH/LIPS |
| HN | NOSE |
| HS | SCALP |

- | | |
|----|------------|
| KB | BOTH KNEES |
| KS | KNEE |

- | | |
|----|------------------------------------|
| LB | BOTH LEGS/HIPS/
ANKLES/BUTTOCKS |
| LS | SINGLE LEG/HIP/
ANKLE/BUTTOCK |

- | | |
|----|-------------|
| MB | BOTH HANDS |
| MS | SINGLE HAND |

- | | |
|----|-------------|
| PB | BOTH FEET |
| PS | SINGLE FOOT |

- | | |
|----|-------------------------|
| R1 | SINGLE COLLAR BONE |
| R2 | BOTH COLLAR BONES |
| R3 | SHOULDER BLADE |
| R4 | BOTH SHOULDER BLADES |
| RB | RIB |
| RS | STERNUM (BREAST BONE) |
| RV | VERTEBRAE (SPINE, DISC) |
| RZ | TRUNK BONES OTHER |

- | | |
|----|-----------------|
| SB | BOTH SHOULDERS |
| SS | SINGLE SHOULDER |

- | | |
|----|--------------|
| TB | BOTH THUMBS |
| TS | SINGLE THUMB |

- | | |
|----|------------------------|
| V1 | LUNG, SINGLE |
| V2 | LUNGS, BOTH |
| V3 | KIDNEY, SINGLE |
| V4 | KIDNEYS, BOTH |
| VH | HEART |
| VL | LIVER |
| VR | REPRODUCTIVE ORGANS |
| VS | STOMACH |
| VV | INTESTINES |
| VZ | TRUNK, INTERNAL; OTHER |

f. NATURE OF INJURY/ILLNESS—Select the most appropriate nature of injury/illness from the list below. This nature of injury/illness shall correspond to the primary body part selected in 5e, above. Enter the nature of injury/illness name on the line and place the corresponding CODE letters in the box provided.

CODE SOURCE OF INJURY NAME

0200 ENVIRONMENTAL CONDITION
0210 TEMPERATURE EXTREME (INDOOR)
0220 WEATHER (ICE, RAIN, HEAT, ETC.)
0230 FIRE, FLAME, SMOKE (NOT TOBACCO)
0240 NOISE
0250 RADIATION
0260 LIGHT
0270 VENTILATION
0271 TOBACCO SMOKE
0280 STRESS (EMOTIONAL)
0290 CONFINED SPACE
0300 MACHINE OR TOOL
0310 HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320 HAND TOOL (NONPOWERED)
0330 MECHANICAL POWER TRANSMISSION APPARATUS
0340 GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350 VIDEO DISPLAY TERMINAL
0360 PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370 HEATING EQUIPMENT
0380 WELDING EQUIPMENT
0400 VEHICLE
0411 AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412 AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421 DRIVER OF GOVERNMENT VEHICLE
0422 PASSENGER OF GOVERNMENT VEHICLE
0430 COMMON CARRIER (AIRLINE, BUS, ETC.)
0440 AIRCRAFT (NOT COMMERCIAL)
0450 BOAT, SHIP, BARGE
0500 MATERIAL HANDLING EQUIPMENT
0510 EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520 CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530 ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540 HOIST, SLING CHAIN, JACK
0550 CRANE
0551 FORKLIFT
0560 HANDTRUCK, DOLLY
0600 DUST, VAPOR, ETC.
0610 DUST (SILICA, COAL, ETC.)
0620 FIBERS
0621 ASBESTOS
0630 GASES
0631 CARBON MONOXIDE
0640 MIST, STEAM, VAPOR, FUME
0641 WELDING FUMES
0650 PARTICLES (UNIDENTIFIED)
0700 CHEMICAL, PLASTIC, ETC.
0711 DRY CHEMICAL-CORROSIVE
0712 DRY CHEMICAL-TOXIC
0713 DRY CHEMICAL-EXPLOSIVE
0714 DRY CHEMICAL-FLAMMABLE
0721 LIQUID CHEMICAL-CORROSIVE
0722 LIQUID CHEMICAL-TOXIC
0723 LIQUID CHEMICAL-EXPLOSIVE
0724 LIQUID CHEMICAL-FLAMMABLE
0730 PLASTIC
0740 WATER
0750 MEDICINE
0800 INANIMATE OBJECT
0810 BOX, BARREL, ETC.
0820 PAPER
0830 METAL ITEM, MINERAL
0831 NEEDLE
0840 GLASS
0850 SCRAP, TRASH
0860 WOOD
0870 FOOD
0880 CLOTHING, APPAREL, SHOES
0900 ANIMATE OBJECT
0911 DOG
0912 OTHER ANIMAL
0920 PLANT
0930 INSECT
0940 HUMAN (VIOLENCE

0950 HUMAN (COMMUNICABLE DISEASE)
0960 BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE SOURCE OF INJURY NAME

1000 PERSONAL PROTECTIVE EQUIPMENT
1010 PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020 RESPIRATOR, MASK
1021 DIVING EQUIPMENT
1030 SAFETY BELT, HARNESS
1040 PARACHUTE

INSTRUCTIONS FOR SECTION 6—PUBLIC FATALITY

- a. **ACTIVITY AT TIME OF ACCIDENT**—Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box if the activity performed is not identified on the list. Select from the most appropriate primary activity area (water related, non-water related or other activity), the code number for "Other," and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

- | | |
|-----------------------------------|---|
| 1. Sailing | 9. Swimming/designated area |
| 2. Boating - powered | 10. Swimming/other area |
| 3. Boating - unpowered | 11. Underwater activities (skin diving scuba, etc.) |
| 4. Water skiing | 12. Wading |
| 5. Fishing from boat | 13. Attempted rescue |
| 6. Fishing from bank dock or pier | 14. Hunting from boat |
| 7. Fishing while wading | 15. Other |
| 8. Swimming/supervised area | |

NON-WATER RELATED RECREATION

- | | |
|--|--|
| 16. Hiking and walking | 23. Sports/summer (baseball, football, etc.) |
| 17. Climbing (general) | 24. Sports/winter (skiing, sledding, snowmobiling, etc.) |
| 18. Camping/picnicking authorized area | 25. Cycling (bicycle, motorcycle, scooter) |
| 19. Camping/picnicking unauthorized area | 26. Gliding |
| 20. Guided tours | 27. Parachuting |
| 21. Hunting | 28. Other non-water related |
| 22. Playground equipment | |

OTHER ACTIVITIES

- | | |
|--|----------------------------------|
| 29. Unlawful acts (fights, riots, vandalism, etc.) | 33. Sleeping |
| 30. Food preparation/serving | 34. Pedestrian struck by vehicle |
| 31. Food consumption | 35. Pedestrian other acts |
| 32. Housekeeping | 36. Suicide |
| | 37. "Other" activities |

- b. **PERSONAL FLOTATION DEVICE USED**—If fatality was water-related was the victim wearing a personal flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7—MOTOR VEHICLE ACCIDENT

- a. **TYPE OF VEHICLE**—Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.
- b. **TYPE OF COLLISION**—Mark appropriate box.
- c. **SEAT BELT**—Mark appropriate box.

INSTRUCTIONS FOR SECTION 8—PROPERTY/MATERIAL INVOLVED

- a. **NAME OF ITEM**—Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.
- b. **OWNERSHIP**—Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE*)
- c. **\$ AMOUNT OF DAMAGE**—Enter the total estimated dollar amount of damage (parts and labor), if any.

* The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
*TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION
	TB	BACK STRAIN
	TC	CONTUSION, BRUISE, ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
POISONING	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
DISEASE	TQ	TRAUMATIC FOOD
	TW	TRAUMATIC TUBERCULOSIS
VASCULAR	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC
	T1	TRAUMATIC CEREBRAL CONDITION/STROKE
CONDITION	T2	TRAUMATIC HEARING LOSS
	T3	TRAUMATIC HEART
DISORDER	T4	TRAUMATIC MENTAL STRESS, NERVOUS
	T8	TRAUMATIC INJURY - OTHER (EXCEPT DISEASE, ILLNESS)

** A nontraumatic physiological harm or loss of capacity produced by systematic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc., or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which does not meet the definition of traumatic injury or disability as described above.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME	
**NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY			
RESPIRATORY DISEASE	RA	ASBESTOSIS	
	RB	BRONCHITIS	
	RE	EMPHYSEMA	
	RP	PNEUMOCONIOSIS	
	RS	SILICOSIS	
	R9	RESPIRATORY DISEASE,	
	OTHER VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
		VC	COCCIDIOMYCOSIS
		VF	FOOD POISONING
VH		HEPATITIS	
VM		MALARIA	
VS		STAPHYLOCOCCUS	
VT		TUBERCULOSIS	
V9		VIROLOGICAL/INFECTIVE/ PARASITIC - OTHER	
DISABILITY, OCCUPATIONAL		DA	ARTHRITIS, BURSITIS
	DB	BACK STRAIN, BACK SPRAIN	
	DC	CEREBRAL VASCULAR CONDITION: STROKE	
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES R&S)	
	DE	EFFECT OF ENVIRONMENTAL CONDITION	
	DH	HEARING LOSS	
	DK	HEART CONDITION	
	DM	MENTAL DISORDER, EMOTIONAL STRESS, NERVOUS CONDITION	
	DR	RADIATION	
	DS	STRAIN, MULTIPLE	

GENERAL NATURE CATEGORY

CODE NATURE OF INJURY NAME

SKIN DISEASE OR CONDITION	DJ	ULCER
	DV	OTHER VASCULAR CONDITIONS
	D9	DISABILITY, OTHER
	SB	BIOLOGICAL
	SC	CHEMICAL
	S9	DERMATITIS, UNCLASSIFIED

g. TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples

(1) An employee tripped on carpet and struck his head on a desk.
TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/ oak.
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliver while grinding a turbine blade
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.
TYPE: 800 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 800, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT TY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0800	TRAVELING IN

CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC.)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOILER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

INSTRUCTIONS FOR SECTION 9—VESSEL/ FLOATING PLANT ACCIDENT

- a. TYPE OF VESSEL/FLOATING PLANT — Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/floating plant.

VESSEL/FLOATING PLANTS

- | | |
|------------------------|-----------------------------|
| 1. ROW BOAT | 7. DREDGE/DIPPER |
| 2. SAIL BOAT | 8. DREDGE/CLAMSHELL, BUCKET |
| 3. MOTOR BOAT | 9. DREDGE/PIPE LINE |
| 4. BARGE | 10. DREDGE/DUST PAN |
| 5. DREDGE/HOPPER | 11. TUG BOAT |
| 6. DREDGE/SIDE CASTING | 12. OTHER |

- b. COLLISION/MISHAP— Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

- | | |
|-----------------------------|-----------------------|
| 1. COLLISION W/OTHER VESSEL | 7. HAULAGE UNIT |
| 2. UPPER GUIDE WALL | 8. BREAKING TOW |
| 3. UPPER LOCK GATES | 9. TOW BREAKING TOW |
| 4. LOCK WALL | 10. SWEEP DOWN ON DAM |
| 5. LOWER LOCK GATES | 11. BUOY/DOLPHIN/CELL |
| 6. LOWER GUIDE WALL | 12. WHARF OR DOCK |
| | 13. OTHER |

INSTRUCTIONS FOR SECTION 10—ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT—Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specific. Continue on blank sheets if necessary and attach to this report.

INSTRUCTIONS FOR SECTION 11—CAUSAL FACTORS

- a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain on item 13 below. Consider, as a minimum, the following:

- (1) DESIGN— Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) INSPECTION/MAINTENANCE — Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site, or work activity inspections have helped avoid the accident?
- (3) PERSON'S PHYSICAL CONDITION — Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was overexertion a factor?
- (4) OPERATING PROCEDURES— Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) JOB PRACTICES — Were any of the provisions of the Safety and Health Requirements Manual (EM 381-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

- (6) HUMAN FACTORS — Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person, i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc. at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
 - (7) ENVIRONMENTAL FACTORS — Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc. play a part in the accident?
 - (8) CHEMICAL AND PHYSICAL AGENT FACTORS — Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?
 - (9) OFFICE FACTORS — Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
 - (10) SUPPORT FACTORS — Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc.?
 - (11) PERSONAL PROTECTIVE EQUIPMENT— Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?
 - (12) DRUGS/ALCOHOL— Is there any reason to believe the person's mental or physical capabilities, judgment, etc. were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers."
- b. WRITTEN JOB/ACTIVITY HAZARD ANALYSIS — Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident. Mark the appropriate box. *If one was performed, attach a copy of the analysis to the report.*

INSTRUCTIONS FOR SECTION 12 — TRAINING

- a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? — For the purpose of this section, "trained" means the person has been provided the necessary information [either formal and/or on-the-job (OJT) training] to competently perform the activity/task in a safe and healthful manner.
- b. TYPE OF TRAINING — Mark the appropriate box that best indicates the type of training (classroom or on-the-job) that the injured person received before the accident happened.
- c. DATE OF MOST RECENT TRAINING — Enter the month, day, and year of the last *formal* training completed that covered the activity-task being performed at the time of the accident.

INSTRUCTIONS FOR SECTION 13—CAUSES

- a. **DIRECT CAUSES** — The direct cause is that single factor which most directly lead to the accident. See examples below.
- b. **INDIRECT CAUSES** — Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

- a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: failure to provide fall protection at elevation.
Indirect causes: failure to enforce USACE safety requirements; improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.
- b. Private citizen has stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle (note USACE vehicle was in proper/safe working condition).
Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.
Indirect cause: failure of employee to pay attention to driving (defensive driving).

INSTRUCTIONS FOR SECTION 14—ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION — Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15—DATES FOR ACTION

- a. **BEGIN DATE** — Enter the date when the corrective action(s) identified in Section 14 will begin.
- b. **COMPLETE DATE** — Enter the date when the corrective action(s) identified in Section 14 will be completed.
- c. **TITLE AND SIGNATURE** — Enter the title and signature of supervisor completing the accident report. For a **GOVERNMENT** employee accident/illness the immediate supervisor will complete and sign the report. For **PUBLIC** accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For **CONTRACTOR** accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e, and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.
- d. **DATE SIGNED** — Enter the month, day, and year that the report was signed by the responsible supervisor.
- e. **ORGANIZATION NAME** — For **GOVERNMENT** employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For **PUBLIC** accidents enter the USACE organization name for the person identified in block 15.c. For **CONTRACTOR** accidents enter the USACE organization name for the USACE office responsible for providing contact administration oversight.
- f. **OFFICE SYMBOL** — Enter the latest complete USACE Office Symbol for the USACE organization identified in block 15.e.

INSTRUCTIONS FOR SECTION 16—MANAGEMENT REVIEW (1st)

1st REVIEW — Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

INSTRUCTIONS FOR SECTION 17—MANAGEMENT REVIEW (2nd)

2nd REVIEW — The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18—SAFETY AND OCCUPATIONAL HEALTH REVIEW

3rd REVIEW — The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date, and forward to FOA Commander for review, comment, and signature.

INSTRUCTIONS FOR SECTION 19—COMMAND APPROVAL

4th REVIEW — The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to FOA Safety and Occupational Health Office. Signature authority should not be delegated.