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Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites

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Idaho Completion Project

Bechtel BWXT Idaho, LLC

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ABSTRACT

This health and safety plan establishes the procedures and requirements that will be used to eliminate or minimize health and safety risks to personnel performing Waste Area Group 10 remedial actions at trinitrotoluene and Royal Demolition Explosive-contaminated sites at the Idaho National Engineering and Environmental Laboratory, as required by the Occupational Safety and Health Administration standard, "Hazardous Waste Operations and Emergency Response." This health and safety plan contains information about the hazards involved in performing the work as well as the specific actions and equipment that will be used to protect personnel while working at the task site.

This health and safety plan is intended to give safety and health professionals the flexibility to establish and modify site safety and health procedures throughout the entire span of site operations, based on the existing and anticipated hazards.

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
BEI	biological exposure index
BIC	Balance of INEEL Cleanup
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
CWA	controlled work area
DAR	Document Action Request
dBA	decibel A-weighted
dBC	decibel C-weighted
DMCS	Document Management Control System
DOE	U.S. Department of Energy
DWA	designated work area
EOD	explosive ordnance disposal
GDE	guide
HASP	health and safety plan
HAZMAT	hazardous material
HAZWOPER	hazardous waste operations and emergency response
HEPA	high-efficiency particulate air
HSO	health and safety officer
IARC	International Agency for Research on Cancer

IDLH	immediately dangerous to life or health
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
ISMS	Integrated Safety Management System
JSA	job safety analysis
LEL	lower exposure limit
MCP	management control procedure
MDA	Mass Detonation Area
NIOSH	National Institute of Occupational Safety and Health
NPG	Naval Proving Grounds
NRR	noise reduction rating
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PLN	plan
POD	plan of the day
PPE	personal protective equipment
ppm	parts per million
PRD	program requirements document
RadCon	radiological control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDX	Royal Demolition Explosive
RWP	radiological work permit
SAIC	Science Applications International Corporation
STEL	short-term exposure limit

SWP	safe work permit
TLV	threshold limit value
TNT	trinitrotoluene
TRAIN	Training Records and Information Network
TWA	time-weighted average
UV	ultraviolet light
UXO	unexploded ordnance
VPP	Voluntary Protection Program
WAG	waste area group
WCC	Warning Communications Center

Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites

1. INTRODUCTION

1.1 Purpose

This health and safety plan (HASP) establishes the procedures and requirements that will be used to eliminate or minimize health and safety hazards to personnel conducting Waste Area Group (WAG) 10 remedial actions for sites contaminated with trinitrotoluene (TNT) and Royal Demolition Explosive (RDX) at the Idaho National Engineering and Environmental Laboratory (INEEL).

1.2 Scope and Objectives

This HASP addresses all work activities associated with the sampling, removal, disposal, and site-restoration activities at the WAG 10 sites contaminated with TNT/RDX fragments and residues. The objective of this HASP is to meet the regulatory requirements of the Occupational Safety and Health Administration (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120). This HASP governs all work at the project sites that is performed by INEEL management and operations contractor personnel, subcontractors, and any other personnel who enter the project sites.

This HASP has been reviewed and revised, as deemed appropriate, by the health and safety officer (HSO) in conjunction with other project personnel and management to ensure its effectiveness and suitability. With the exception of Table 10-4, this HASP will be revised as necessary to address changes in scope and for field use suitability.

1.3 Idaho National Engineering and Environmental Laboratory Site Description

The INEEL, formerly the National Reactor Testing Station, encompasses 2,305 km^2 (890 mi^2), and it is located approximately 55 km (34 mi) west of Idaho Falls, Idaho (Figure 1-1). The U.S. Department of Energy (DOE) Idaho Operations Office is responsible for the INEEL. The DOE Idaho office designates operating authority of the INEEL to government management and operating contractors.

In 1949, the U.S. Atomic Energy Commission (now the DOE) established the National Reactor Testing Station (now the INEEL) as a site for building and testing a variety of nuclear facilities. In addition, the INEEL has been the storage facility for transuranic radionuclides and radioactive low-level waste since 1952. At present, the INEEL supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear-defense materials production, waste management technology development, energy technology and conservation programs, and DOE long-term stewardship programs.

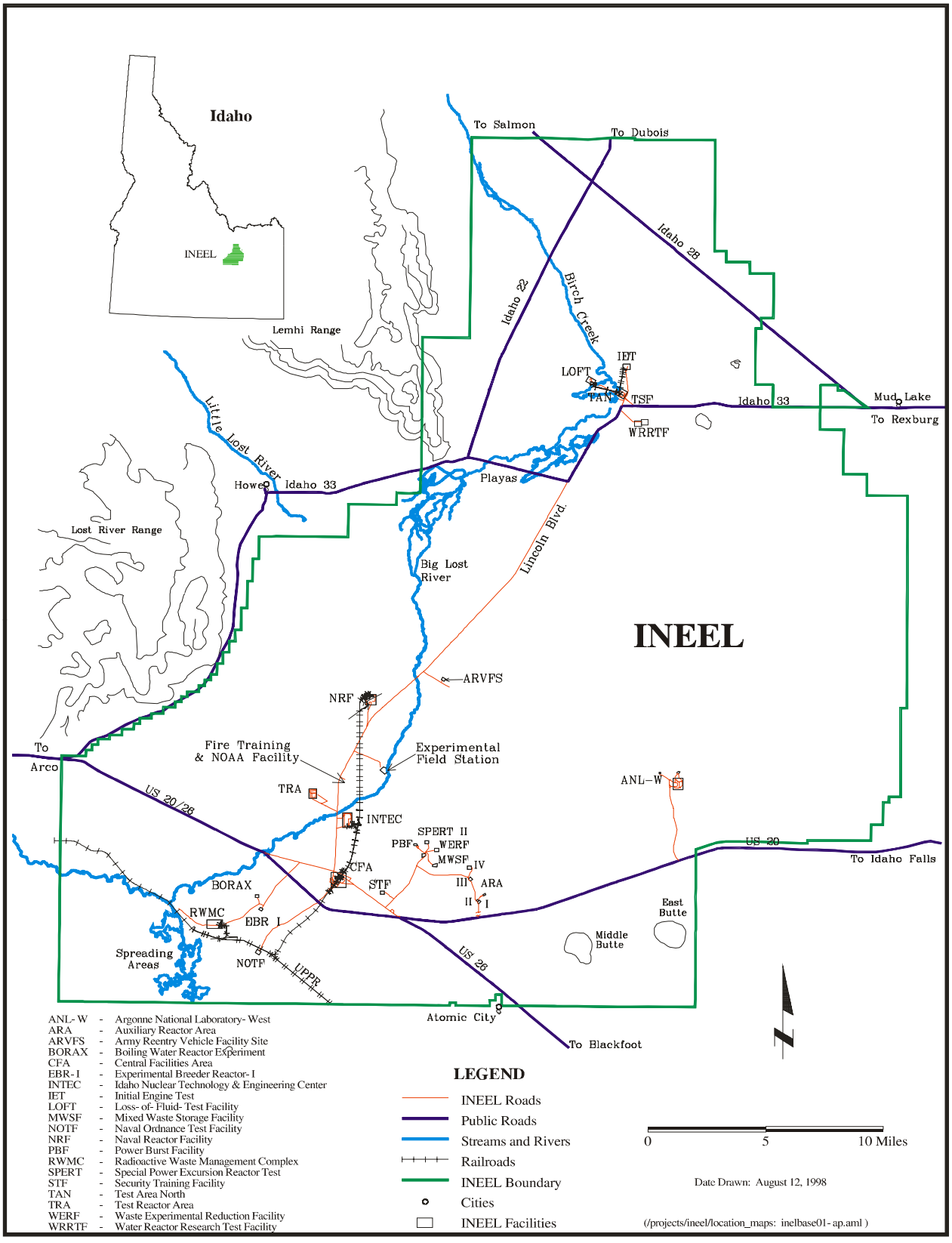


Figure 1-1. Map of the Idaho National Engineering and Environmental Laboratory Site showing locations of major facilities.

1.4 Background and Project Site Description

An area of approximately 699 km^2 (270 mi^2) that was previously known as the Naval Proving Grounds (NPG) is located within the INEEL boundary. The NPG was established to proof-test guns manufactured, repaired, and assembled at the Naval Ordnance Plant in Pocatello, Idaho. Between 1942 and 1949, approximately 1,650 minor (3- to 5-in.) and major (8- to 16-in.) guns were proofed at the NPG.

Additional work conducted at the NPG included experimental and test work—primarily in mass explosions conducted by the U.S. Army/Navy Explosives Safety Board; the U.S. Navy Bureau of Ordnance; and the U.S. Army Safety and Security Division, Ordnance Department. During these tests, hundreds of thousands of kilograms of explosives in projectiles, land mines, smokeless powder, and bombs were placed in explosives storage bunkers and detonated to determine the effects on other storage bunkers and facilities.

Portions of the NPG and areas near the NPG also served as bombing ranges for Army Air Corps aircraft flying from Boise and Pocatello. Portions of 100- to 2,000-lb bombs have been found in some areas of the INEEL.

Because of the NPG activities, some areas of the INEEL contain unexploded ordnance (UXO) and ordnance-explosive-contaminated soil (Figure 1-2). Despite several removal actions in recent years, UXO can still be found in areas throughout the INEEL. These ordnance sites are a potential safety hazard to site field personnel, and they present a security risk of deliberate detonation. As these areas are discovered, removal and detonation of UXO may be performed to remove these safety and security risks.

1.5 Scope of Work

Remedial action is required for five sites contaminated with TNT and RDX. Activities will require the removal and detonation of TNT and RDX fragments and remediation of soil found at the sites contaminated with chemical compounds (principally TNT and RDX) from explosive tests. The five sites that are located inside the NPG are as follows:

- Fire Station II Zone and Range Fire Burn Area
- Experimental Field Station
- Land Mine Fuze Burn Area
- National Oceanic and Atmospheric Administration Soil Sites
- Naval Ordnance Disposal Area, Area 2 Soil Site.

A more detailed description of each site is presented in the *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II* (DOE-ID 2004a) and the *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04* (DOE-ID 2001). Figure 1-2 shows the location of the five TNT/RDX-contaminated sites within the NPG.

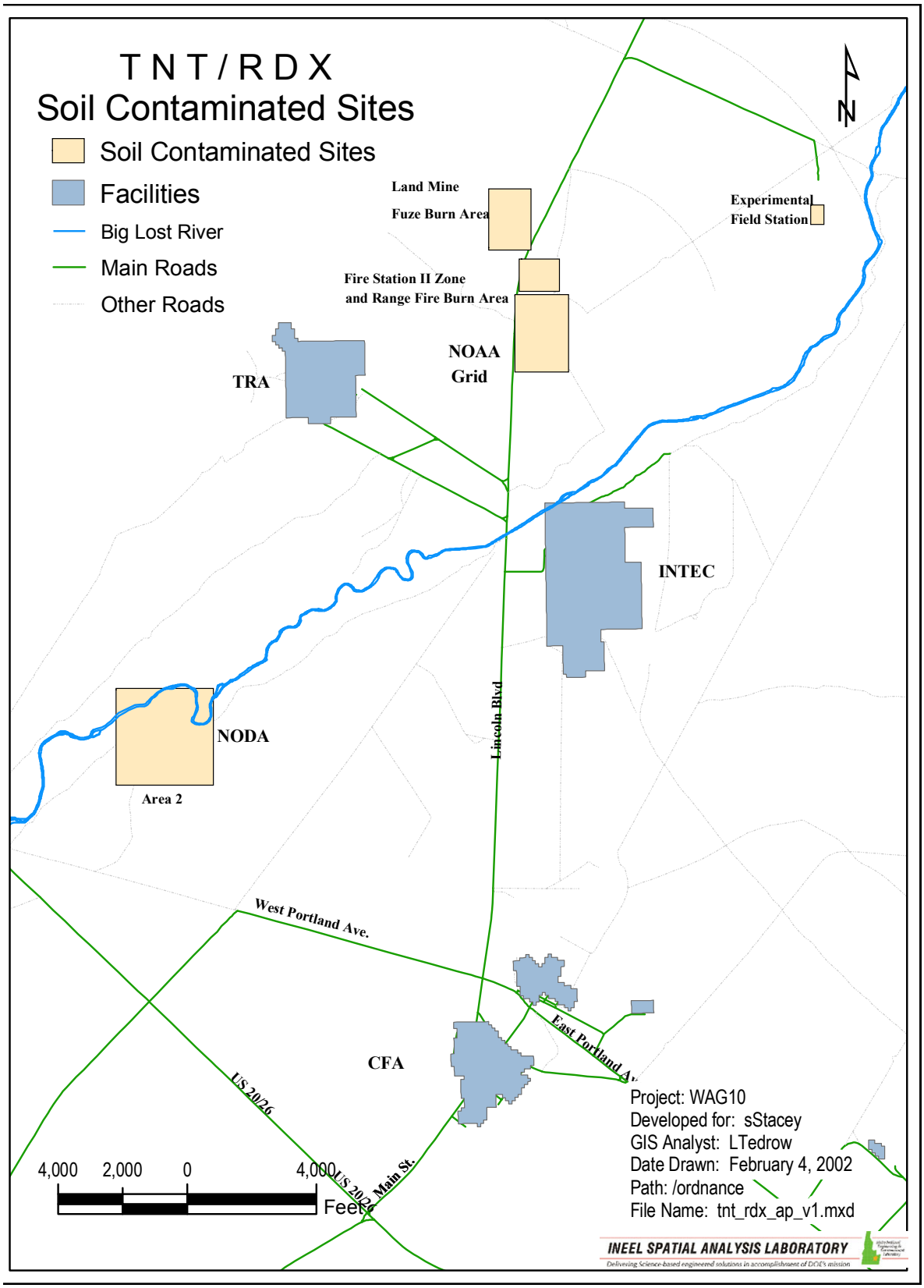


Figure 1-2. Location of sites with soil contaminated by trinitrotoluene/Royal Demolition Explosive.

The principal work remedial actions will be as follows:

- Perform a visual survey for UXO, TNT/RDX, and stained soil and a geophysical survey for UXO.
- Sample and analyze removed soil to determine the TNT/RDX concentrations and whether the soil exhibits any Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics (42 USC § 6901 et seq.).
- Manually segregate fragments of TNT/RDX from the soil, unless the safety assessment indicates it is safe to mechanically screen the soil. Dispose of the TNT/RDX fragments by detonation at the Mass Detonation Area (MDA) or detonate the TNT/RDX fragments in place if they cannot be transported safely to the MDA.
- Excavate soil contaminated with concentrations in excess of the remediation goals by hand unless it is determined that mechanical excavation equipment can be used. The UXO will be removed, if required, to proceed with soil excavation. Otherwise, UXO removal will be performed during remediation of the ordnance areas.
- Backfill areas excavated to depths greater than 0.3 m (1 ft) with uncontaminated soil or contour to match the surrounding terrain and revegetate
- Use field-screening methods and collect confirmatory soil samples for laboratory analysis following remediation.

The UXO surveys and removal, if required, will be performed using standard military techniques. The work will require military-trained explosive ordnance disposal (EOD) technicians and supervisors. Standard EOD equipment—such as magnetometers, hand excavation equipment (e.g., shovels and trowels), countercharging explosives and initiating equipment, and approved explosive storage facilities—may be used. Typically, each ordnance item is surveyed using Global Positioning System instruments before removal or in-place detonation.

The UXO-qualified HSO will examine each item before its transport. If the UXO-qualified HSO determines that the UXO can be safely handled and transported, it will be transported to the blast site for detonation. If the UXO-qualified HSO determines that the projectile (or other items) cannot be safely transported, the UXO will be detonated in place.

The MDA is a blast area east of Lincoln Boulevard at Mile Marker 8 that has been cleared for UXO. A large crater at the MDA is used to countercharge UXO and ordnance explosive, and a reinforced concrete bunker is available for personnel protection. After countercharging, the blast area will be inspected for shrapnel and complete detonation of explosive materials. Explosive material released due to incomplete detonation will be countercharged again. Nonhazardous solid waste, such as shrapnel or inert rounds, will be disposed of at the Central Facilities Area (CFA) landfill or will be recycled. Inert rounds will be demilitarized before release for disposal or recycling. Sampling will be performed to determine if products of incomplete combustion are present after detonation events at the MDA. After remediation of the ordnance areas and the TNT/RDX sites is complete, the MDA will be investigated for remediation. The *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004b) describes the field sampling activities that will be performed.

The TNT and RDX fragments will be segregated from the soil. Soil will be characterized and excavated either manually or mechanically, as permitted by safety analysis. The contaminated soil will be disposed of at an approved facility on or off the INEEL Site. Verification sampling will be performed to

confirm that soil above the remediation goals has been removed. The sites will be restored in accordance with INEEL revegetation procedures.

2. HAZARD IDENTIFICATION AND MITIGATION

The purpose of this section is to help the user to understand the occupational safety and health hazards associated with project tasks. This will enable project management and safety and health professionals to make effective and efficient decisions related to the equipment, processes, procedures, and resource allocation to protect the safety and health of project personnel.

The overall objective of this section is to identify existing and anticipated hazards based on the project scope of work and to provide controls to eliminate or mitigate these hazards. The hazard mitigation objective will be accomplished by performing the following tasks:

- Evaluate each project task to determine the physical hazards and chemical and biological exposure potential to project personnel by all routes of entry (radioactive contamination at these WAG 10 sites is not expected).

- Establish the necessary monitoring and sampling required to evaluate the effectiveness of engineering and administrative controls, personal exposures, and contamination levels; determine action levels to mitigate exposures; and provide specific actions to be followed if action levels are reached.

- Determine the necessary engineering controls, isolation methods, administrative controls, work practices, and (where these measures will not adequately control hazards) personal protective equipment (PPE) to further protect project personnel from hazards.

The magnitude of danger presented by these hazards to personnel entering work zones depends on the nature of tasks being performed and the proximity of personnel to the hazards. Engineering controls will be implemented (whenever possible) along with administrative controls, work control practices, and PPE to further mitigate potential exposures to agents and hazards.

Hazard mitigation listed in this section will be used in combination with INEEL work control processes (e.g., technical procedures, work orders, job safety analyses [JSAs], and Guide [GDE] -6212 "Hazard Mitigation Guide for Integrated Work Control Process") to eliminate or mitigate hazards.

All UXO and ordnance explosive activities will be performed using currently accepted practices and standard operating procedures, including, but not limited to, the following:

- DOE M 440.1-1, *DOE Explosives Safety Manual*

- Plan (PLN) -320, "Transport Plan for the Shipment of Explosive Materials within the Boundaries of the INEEL"

- "Safety Concepts and Basic Considerations for Unexploded Ordnance" (U.S. Army Corps of Engineers 2001)

- Explosive Ordnance Disposal Procedures, Joint Service Publications (U.S. Military "60 Series Publications")

- Technical Order 11A-1-42, "General Instructions for Disposal of Conventional Munitions" (U.S. Air Force)

- The requirements listed in 29 CFR 1926, Subpart U, "Blasting and the Use of Explosives," will be followed (as applicable).

NOTE: Depending on the area in which UXO is found, additional governing documents may apply to a specific removal project. For example, the *Health and Safety Plan for the Removal and Detonation of Unexploded Ordnance at the INEEL* (INEEL 2002) applies to other INEEL areas with UXO.

2.1 Chemical Hazards and Mitigation

Ordnance explosives and their detonation by-products present chemical hazards at the contaminated site. However, there is minimal potential for exposure to these chemical hazards during project tasks if the standard operating procedures and technical requirements mentioned above are followed. Table 2-1 lists the ordnance explosive contaminants of concern, maximum soil concentrations, and approximate quantity for the five soil sites. Other potential chemical hazards might be present from chemicals and fuels in use at the project site.

Table 2-2 lists the applicable exposure limits and brief toxicological information for each of the potential chemical hazards of concern. Table 2-2 also lists the chemical, safety and physical, and environmental hazards that might be encountered during project operations, based on known ordnance explosive contaminants, UXO, and operational activities. Table 2-3 summarizes the project tasks and associated hazard and mitigation. Monitoring for specific hazardous agents is covered in Section 3.

Safe work permits (SWPs) and radiological work permits (RWPs) may be used in conjunction with this HASP to address specific hazardous operations (e.g., hot work) and radiological conditions if encountered at specific project sites. If used, these permits will provide further detail regarding specialized PPE and dosimeter requirements.

Table 2-1. Ordnance explosive contaminants of concern.[a]

Site	Contaminant of Concern	Exposure Point Concentration (mg/kg)	Contaminated Soil Volume m^3 (yd^3)
Fire Station II Zone and Range Fire Burn Area	TNT	130 (maximum)	76.5 (100)
	RDX	3.7 (maximum)	
Experimental Field Station	TNT	1,100 (maximum)	76.5 (100)
	1,3-Dinitrobenzene	14 (maximum)	
Land Mine Fuze Burn Area	TNT	69,000 (maximum)	1.5–7.7 (2–10)
National Oceanic and Atmospheric Administration	TNT	1,900 (95% upper confidence level)	268 (350)
	RDX	1.78 (95% upper confidence level)	
	1,3-Dinitrobenzene	27 (maximum)	
Naval Ordnance Disposal Area	RDX	328 (maximum)	38 (50)

a. Source: *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II* (DOE-ID 2004a).
RDX = Royal Demolition Explosive
TNT = trinitrotoluene

Table 2-2. Evaluation of chemicals and potential agents that could be encountered.

Material or Chemical (CAS No.)	Exposure Limit[a] (PEL and TLV)	Routes of Exposure	Symptoms of Overexposure (Acute and Chronic)	Target Organs and System	Carcinogen? (Source)[b]	Matrix or Source at Project Site
2,4,6-TNT (118-96-7)	PEL = 1.5 mg/m^3 TLV = 0.1 mg/m^3	Inhalation, skin absorption, ingestion, and skin or eye contact	Skin and mucous membrane irritation, liver damage, cyanosis, jaundice, sneezing, cough, sore throat, muscle pain, kidney damage, cataract, anemia, and cardiac irregularities	Eyes, skin, respiratory system, blood, liver, cardiovascular system, central nervous system, and kidneys	No	Common explosive
Cyclotrimethylene-trinitramine (RDX, cyclonite) (121-82-4)	TLV = 0.5 mg/m^3	Inhalation, skin absorption, ingestion, and skin or eye contact	Eye and skin irritation, headache, irritability, weakness, tremor, nausea, dizziness, insomnia, and convulsions	Eyes, skin, and central nervous system	ACGIH – A4	Common explosive
Cyclotetramethylene-tetranitramine (2691-41-0)	None listed	Not available	Not available	Not available	No	Common explosive constituent
Dinitrobenzene *All isomers* (528-29-0, 99-65-0, and 100-25-4)	PEL = 1 mg/m^3 TLV = 0.15 mg/m^3	Inhalation, skin absorption, ingestion, and skin or eye contact	Anoxia; cyanosis; visual disturbance; bad taste; dry throat; yellowing hair, skin, and eyes; anemia; and liver damage	Eyes, skin, blood, liver, cardiovascular system, and central nervous system	No	Common explosive constituent
Dinitrotoluene (25321-14-6)	PEL = 1.5 mg/m^3 TLV = 0.2 mg/m^3	Inhalation, skin absorption, ingestion, and skin or eye contact	Anoxia, cyanosis, anemia, jaundice, and reproductive effects	Blood, liver, cardiovascular system, and reproductive system	IARC – 2B (2,4- and 2,6-isomers)	Common explosive constituent

Table 2-2. (continued).

Material or Chemical (CAS No.)	Exposure Limit[a] (PEL and TLV)	Routes of Exposure	Symptoms of Overexposure (Acute and Chronic)	Target Organs and System	Carcinogen? (Source)[b]	Matrix or Source at Project Site
Ammonia (NH_3) (7664-41-7)	PEL = 50 ppm TLV = 25 ppm STEL = 35 ppm	Inhalation	Eye, nose, and throat irritation; breathing difficulty; chest pain; and pink, frothy sputum	Eyes, skin, and respiratory system	No	Combustion product at detonation site
Ammonium picrate (Explosive D)	None listed	Inhalation, skin, and ingestion	Dermatitis, nausea, diarrhea, staining of the skin, seizures, and irritation of the eyes, skin, and mucous membranes	Eyes, skin, and central nervous system	No	Common explosive constituent
Carbon monoxide (630-08-0)	PEL = 50 ppm TLV = 25 ppm	Inhalation	Headache, nausea, weakness, dizziness, confusion, hallucinations, cyanosis, and unconsciousness	Cardiovascular system, blood, lungs, and central nervous system	No	Incomplete combustion product at detonation site
Diesel fuel (68476-34-6) (68334-30-5) (68334-30-2) (68476-31-3) (77650-28-3)	TLV = 100 mg/m^3 (ACGIH—as total hydrocarbons)	Inhalation, ingestion, and skin contact	Eye irritation, respiratory system changes, and dermatitis	Eyes and respiratory system	No	Fuel handling during refueling of diesel-powered equipment
Diesel exhaust particulate	TLV—withdrawn in 2003 *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (AGGIH 2003)	Inhalation	Respiratory, nose, throat or lung irritation with stinging and redness of the eyes; headache; nausea; dizziness; and unconsciousness	Respiratory system	No	Exhaust from diesel-powered equipment

Table 2-2. (continued).

Material or Chemical (CAS No.)	Exposure Limit[a] (PEL and TLV)	Routes of Exposure	Symptoms of Overexposure (Acute and Chronic)	Target Organs and System	Carcinogen? (Source)[b]	Matrix or Source at Project Site
Hydrogen cyanide (74-90-8)	PEL = 10 ppm TLV = 5 mg/m^3 (4.7 ppm) Ceiling	Inhalation, skin absorption, ingestion, and skin or eye contact	Asphyxia, weakness, headache, confusion, nausea, and thyroid and blood changes	Central nervous system, cardiovascular system, thyroid, and blood	No	Combustion product at detonation site

a. Sources: *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (ACGIH 2003) and substance-specific standards (29 CFR 1910.1000, "Air Contaminants").

b. If yes, identify agency and appropriate designation (i.e., ACGIH A1 or A2, NIOSH, OSHA, IARC; or National Toxicology Program).

ACGIH = American Conference of Governmental Industrial Hygienists
BEI = biological exposure index
CAS = Chemical Abstract Service
IARC = International Agency for Research on Cancer
NIOSH = National Institute of Occupational Safety and Health
PEL = permissible exposure limit
ppm = parts per million
RDX = Royal Demolition Explosive
STEL = short-term exposure limit
TLV = threshold limit value
TNT = trinitrotoluene

Table 2-3. Project activities, associated hazards, and mitigation.

Activity or Task	Associated Hazards or Hazardous Agent	Hazard Mitigation
• Perform a visual and geophysical survey for UXO. • Sample and analyze removed soil to determine disposition. • Manually segregate fragments of TNT and RDX from the soil. • Dispose of the TNT and RDX fragments by detonation at the MDA. • Perform hand and mechanical excavation. • Field-screen soils during excavation • Collect confirmatory soil samples. • Backfill excavated areas and revegetate.	1. The UXO and demolition explosives 2. Chemical/ordnance explosive contaminants—ordnance explosive soil contaminants, chemical usage at sites, and residues at the MDA 3. Heavy equipment movement/vehicle traffic—swing radius, pinch points, and struck-by or caught-between hazards 4. Lifting and back strain—material movement and hand excavation 5. Open excavation(s)—ordnance explosive-contaminated soil sites requiring heavy equipment excavation 6. Tripping hazards/working-walking surfaces—uneven, unstable or steep terrain; ice and snow-covered surfaces; and rocks and debris 7. Heat and cold stress—outdoor activities 8. Stored energy sources—buried utilities, UXO and explosives, elevated materials, and moving equipment	1. Perform visual and geophysical surveys of areas to identify UXO and control access to UXO areas. The UXO-qualified HSO(s) will handle, store, and detonate UXO in accordance with the requirements identified in Section 2; PLN-320, "Transport Plan for the Shipment of Explosive Materials within the Boundaries of the INEEL"; and the "DOE Explosives Safety Manual" (DOE M 440.1-1). 2. Hazards will be mitigated through controlled access to sites, material safety data sheets for chemicals in use, protective clothing where contact with materials is anticipated, and monitoring exposures to validate engineering control effectiveness. 3. Hazards also will be mitigated through controlled areas, qualified operators, backup signal on equipment and industrial vehicles, body position awareness, communication with operator, and PPE usage in controlled work area. 4. Use mechanical excavation equipment where feasible, use mechanical lifting device where possible, use proper lifting techniques, do not exceed 50-lb (or 1/3 body weight) lift limit, and do not work past fatigue point. 5. Follow all requirements in PRD-22, "Excavation and Surface Penetration"; delineate and post area; and use the barricade or other physical barrier(s) where required to prevent vehicle and equipment from approaching edge. 6. Clear debris and other tripping hazards from areas where feasible, maintain body position awareness, and wear adequate footwear with nonskid/high-friction soles. 7. Industrial hygiene monitoring and work-rest cycles (as required) will be performed/implemented in accordance with MCP-2704, "Heat and Cold Stress."

Table 2-3. (continued).

Activity or Task	Associated Hazards or Hazardous Agent	Hazard Mitigation
		8. Identify and mark all utilities, handle UXO and explosives as stated in Item 1 above, ensure that all equipment is set in park or in gear with brake set, and shut off when not in use.

DOE = U.S. Department of Energy
HSO = health and safety officer
INEEL = Idaho National Engineering and Environmental Laboratory
MCP = management control procedure
MDA = Mass Detonation Area
PLN = plan
PPE = personal protective equipment
PRD = program requirements document
RDX = Royal Demolition Explosive
TNT = trinitrotoluene
UXO = unexploded ordnance

2.2 Safety and Physical Hazards and Mitigation

Industrial safety and physical hazards will present the greatest hazards while performing tasks at the project site. Section 4.2 provides general safe-work practices that must be followed at all times. The following sections describe specific industrial safety hazards related to the ordnance explosive and UXO activities and present procedures to be followed to eliminate or minimize these hazards.

2.2.1 Transportation of Explosive Materials

The UXO-qualified HSO will examine each UXO item before its transport. If the HSO determines that the UXO can be safely handled and transported, it will be transported to the blast site for detonation. If the HSO determines that the projectile (or other items) cannot be safely transported, the UXO will be detonated in place. All UXO will be transported following the regulations listed previously in Section 2, "Hazard Identification and Mitigation."

Demolition explosives (initiating explosives) will be transported from the CFA-609 magazines to the MDA. These explosives will be transported in accordance with the requirements of PLN-320, "Transport Plan for the Shipment of Explosive Materials within the Boundaries of the INEEL." The transportation route will be from the CFA-609 magazines, down Lincoln Boulevard, to the MDA. Demolition explosives will be transported in the afternoon after the UXO has been transported to the detonation pit. No ordnance or explosives will be left at the detonation pit overnight. All demolition explosives transported to the demolition pit will be detonated; no explosives will be returned to the CFA-609 magazines. After the explosives have been unloaded from the explosive transportation truck, the truck will be removed from the area and parked behind the detonation site firing bunker.

2.2.2 Material Handling and Back Strain

Handling material and maneuvering various pieces of equipment could result in employee injury. All lifting and material-handling tasks will be performed in accordance with Management Control Procedure (MCP) -2692, "Ergonomics Program." Personnel will not physically lift objects weighing more than 50 lb or 1/3 their body weight (whichever is less) alone. In addition, back strain and ergonomic considerations must be given to material handling and equipment use. Whenever possible, mechanical and hydraulic lifting devices should be used to move large or heavy materials. The industrial hygienist (IH) may conduct ergonomic evaluations of various project tasks to determine the potential ergonomic hazards and may provide recommendations to mitigate these hazards. In addition, applicable requirements from MCP-2739, "Material Handling, Storage, and Disposal," will be followed.

2.2.3 Repetitive Motion and Musculoskeletal Disorders

Tasks to be conducted may expose personnel to repetitive-motion hazards, undue physical stress, overexertion, awkward postures, or other ergonomic risk factors that could lead to musculoskeletal disorders. Musculoskeletal disorders can cause a number of conditions, including pain, numbness, tingling, stiff joints, difficulty moving, muscle loss, and sometimes paralysis. The assigned project IH will evaluate project tasks and provide recommendations to reduce the potential for musculoskeletal disorders in accordance with the requirements of MCP-2692, "Ergonomics Program."

2.2.4 Working and Walking Surfaces

Slippery or uneven work surfaces can increase the likelihood of back injuries, overexertion injuries, slips, and falls. The ordnance sites are located in the field, and they present inherent tripping hazards such as uneven ground, vegetation, or debris. Tripping and slipping hazards will be evaluated during the course

of the project in accordance with Program Requirements Document (PRD) -5103, "Walking and Working Surfaces."

2.2.5 Fire and Flammable Material Hazards

Detonation of UXO has the inherent potential to cause fires. All flammable materials will be removed from the detonation pit, to the extent feasible, before detonation. Portable fire extinguishers with a minimum rating of 10A/20BC will be located, as needed, at the project site to combat Class ABC fires. In addition, portable fire extinguishers will be located in all vehicles and equipment that have exhaust heat sources and on or near all equipment capable of generating ignition or having the potential to spark. The INEEL fire department shall be present during detonation activities to immediately respond to any fires resulting from UXO detonation.

When electrical explosive detonators are being used, no equipment that produces radio frequency will be allowed within 15 m (50 ft) of the detonators.

2.2.6 Heavy Equipment and Moving Machinery

Heavy equipment may be used to maintain the detonation pit and to remove excess plant growth as a fire-protection measure before detonation activities begin. Hazards associated with the operation of heavy equipment include injury to personnel (e.g., struck-by and caught-between hazards) and equipment and property damage. All heavy equipment will be operated in the manner in which it was intended and in accordance with the manufacturer's instructions. Only authorized, qualified personnel will be allowed to operate equipment; personnel near operating heavy equipment must maintain visual contact with the operator and stay clear of the swing radius (if excavation equipment is used). Personnel will comply with MCP-2745, "Heavy Industrial Vehicles," and PRD-5123, "Motor Vehicle Safety."

2.2.7 Excavation, Surface Penetrations, and Outages

A combination of hand excavation and heavy equipment will be used during the course of this project. In addition, it might be necessary to excavate lightly buried UXO using hand tools. Besides UXO surveys, no surface penetrations will be allowed or conducted until the area has been evaluated and an approved subsurface evaluation has been documented. All surface penetrations and related outages will be coordinated through the field supervisor and will require submittal of Form 433.01, "Outage Request." The submission of an outage request will not be considered an approval to start the work.

All excavation and surface penetration activities will be conducted and monitored in accordance with the requirements of PRD-22, "Excavation and Surface Penetration," and 29 CFR 1926, Subpart P, "Excavations." Key elements from these requirements include the following:

- Daily inspections of excavations and protective systems will be made by a competent person for evidence of situations that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection will be conducted by the competent excavation person before the start of work and as needed throughout the shift. Inspections also will be made following any hazard-increasing occurrence. These inspections are required only when employee exposure can be reasonably anticipated.

- Stop logs, barricades, or chocks may be deployed if necessary to prevent vehicles and heavy equipment from falling into open excavations and trenches. In the event that an excavation must be left open and unattended, the area surrounding it shall be secured. The area shall be clearly posted with caution signs and signs prohibiting unauthorized personnel from entering. Every effort shall be made to fill the open excavations as soon as practicable.

- If used, designs of support systems, shield systems, and other protective systems shall be selected and constructed in accordance with the requirements set forth in 29 CFR 1926, Subpart P, "Excavations."

2.2.8 Hoisting and Rigging of Equipment

Hoisting and rigging of equipment are not anticipated for UXO removal and detonation activities. However, if found necessary, all hoisting and rigging will be performed in accordance with PRD-600, "Maintenance Management Requirements," and DOE-STD-1090-01, "Hoisting and Rigging," as applicable. Evidence of a current inspection will be shown on hoisting and rigging equipment (e.g., tag); qualified personnel will inspect the equipment before use.

2.2.9 Overhead Objects

During UXO detonation, personnel could be exposed to falling overhead objects or debris. Personnel protection bunkers are located at the MDA; the personnel protection bunkers will be used during detonation activities. In addition, all personnel not directly involved with detonation activities (e.g., spectators) must remain behind the designated safe boundary line. Personnel will wear required head protection when they are near heavy equipment.

2.2.10 Personal Protective Equipment

A worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard will be reduced while wearing PPE. In addition, PPE can increase the risk of heat stress. Work activities at the task site will be modified as necessary to ensure that personnel are able to work safely in the required PPE. Work-site personnel will comply with PRD-5121, "Personal Protective Equipment," and MCP-432, "Radiological Personal Protective Equipment," if radiological hazards are encountered. All personnel who wear PPE will be trained in its use and limitations in accordance with PRD-5121.

2.3 Environmental Hazards and Mitigation

During project tasks, potential environmental hazards will present potential hazards to personnel. These hazards will be identified and mitigated to the extent possible. This section describes these environmental hazards and states the procedures and work practices that will be followed to mitigate them.

2.3.1 Noise

Detonation activities could expose personnel to short-duration, high-intensity impact noise. The effects of high sound levels (noise) include the following:

- Personnel being startled, distracted, or fatigued
- Physical ear damage, pain, or temporary or permanent hearing loss
- Interference with communication that would warn of danger.

Personnel will be required to wear hearing protection during UXO detonation. Hearing protection devices will be selected and worn in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise."

2.3.2 Temperature and Ultraviolet Light Hazards

Project tasks will be conducted during times when there is a potential for heat or cold stress that could present a potential hazard to personnel. The IH and HSO will be responsible for obtaining meteorological information to determine if additional heat or cold stress administrative controls are required. All project personnel must understand the hazards associated with heat and cold stress and take preventive measures to minimize the effects. The guidelines in MCP-2704, "Heat and Cold Stress," will be followed when determining work/rest schedules or when determining whether to halt work activities because of temperature extremes.

2.3.2.1 Heat Stress. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort to death. In addition, tasks requiring the use of protective equipment or respiratory protection prevent the body from cooling. Personnel must inform the HSO or project field team leader when experiencing any signs or symptoms of heat stress or when observing a fellow employee (i.e., buddy) experiencing them. The HSO in conjunction with the IH (as required) will document heat stress stay times or work/rest regimens on the appropriate work control document(s) (i.e., an SWP, Pre-Job Briefing Form, or other). These stay times will take into account the amount of time spent on a task, the nature of the work (i.e., light, moderate, or heavy), type of PPE worn, and ambient work temperatures. Table 2-4 lists heat stress signs and symptoms.

Table 2-4. Heat stress signs and symptoms.

Heat-Related Illness	Signs and Symptoms	Emergency Care
Heat rash	Red skin rash and reduced sweating	Keep the skin clean, change all clothing daily, and cover affected areas with powder containing cornstarch or with plain cornstarch.
Heat cramps	Severe muscle cramps and exhaustion, sometimes with dizziness or periods of faintness	Move the patient to a nearby cool place; give the patient half-strength electrolytic fluids; if cramps persist, or if signs that are more serious develop, seek medical attention.
Heat exhaustion	Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; and dizziness that sometimes leads to unconsciousness	Move the patient to a nearby cool place, keep the patient at rest, give the patient half-strength electrolytic fluids, treat for shock, and seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT.
Heat stroke	Deep, then shallow, breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); and seizures or muscular twitching	Cool the patient rapidly. Treat for shock. If cold packs or ice bags are available, wrap them and place one bag or pack under each armpit, one behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as rapidly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND.

NOTE: Heat exhaustion and heat stroke are extremely serious conditions that could result in death and should be treated as such. The field team leader or designee should immediately request that an ambulance (777 or 526-1515) be dispatched from the CFA-1612 medical facility and the individual should be cooled as described in Table 2-4, based on the nature of the heat stress illness.

2.3.2.2 Low Temperatures and Cold Stress. Personnel will be exposed to low temperatures during fall and winter months or at other times of the year if relatively cool ambient temperatures combined with wet or windy conditions exist. The guidelines in MCP-2704, "Controlling Exposure to Heat and Cold Stress," will be followed.

Additional cold weather hazards might exist from working on snow- or ice-covered surfaces. Slip, fall, and material-handling hazards are increased under these conditions. Every effort must be made to ensure that walking surfaces are kept clear of ice. The HSO should be notified immediately if slip or fall hazards are identified at the project locations.

2.3.2.3 Ultraviolet Light Exposure. Personnel will be exposed to ultraviolet (UV) light (i.e., sunlight) when conducting project tasks. Sunlight is the main source of UV light known to damage the skin and cause skin cancer. The amount of UV light exposure depends on the strength of the light, the length of exposure, and whether the skin is protected. No UV rays or suntans are safe. The following are mitigative actions that may be taken to minimize UV exposure:

- Wear clothing to cover the skin (long pants [no shorts] and long-sleeve or short-sleeve shirt [no tank tops]).
- Use a sunscreen with a sun protection factor of at least 15.
- Wear a hat (hard hat where required).
- Wear UV-absorbing safety glasses.
- Limit exposure during peak intensity hours of 10 a.m. to 4 p.m., whenever possible.

2.3.3 Inclement Weather Conditions

When inclement or adverse weather conditions develop that could pose a threat to persons or property at the project site (e.g., sustained strong winds 25 mph or greater, electrical storms, heavy precipitation, or extreme heat or cold), conditions will be evaluated, and a decision will be made by the HSO with input from other personnel to halt work, use compensatory measures, or proceed. All work will comply with INEEL MCPs and facility work control documents that specify limits for inclement weather.

2.3.4 Biological Hazards

The INEEL is located in an area that provides habitat for various rodents, insects, and vectors (i.e., organisms that carry disease-causing microorganisms from one host to another). The potential exists for encountering nesting materials or other biological hazards and vectors. Hantavirus could be present in the nesting and fecal matter of deer mice. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Contact with and improper removal of these materials could cause additional inhalation exposure risks.

If suspected rodent nesting or excrement material is encountered, the IH will be notified immediately and **no attempt will be made to remove or clean the area**. Following an evaluation of the

area, such material will be disinfected and removed in accordance with the requirements of MCP-2750, "Preventing Hantavirus Infection."

Snakes, insects, and arachnids (e.g., spiders and ticks) also may be encountered. Common areas to avoid include material stacking and staging areas, under existing structures (e.g., trailers and buildings), under boxes, and other areas that provide shelter. Generally, protective clothing will prevent insects from direct contact with the skin. If potentially dangerous snakes or spiders are found or are suspected of being present, warn others, keep clear, and contact the IH or HSO for additional guidance.

Insect repellant (with DEET or an equivalent active ingredient) might be required. Areas where standing water has accumulated (e.g., evaporation ponds) provide breeding grounds for mosquitoes; thus, these areas should be avoided. In cases where a large area of standing water is encountered, it might be necessary to pump the water out of the area.

2.3.5 Confined Spaces

Excavations are not anticipated to present hazardous atmospheres, and no other confined spaces are anticipated at the project sites. The IH will be contacted if there is any question as to whether an excavation could present a hazardous atmosphere or if a space meets the definition of a confined space. If entry into a confined space is required, then all requirements of MCP-2749, "Confined Spaces," will be followed.

2.4 Other Task-Site Hazards

Task-site personnel should continually look for potential hazards and immediately inform the UXO supervisor or HSO of the hazards so that action can be taken to correct the condition. All personnel have the authority to initiate STOP WORK actions in accordance with MCP-553, "Stop Work Authority," if it is perceived that an imminent safety or health hazard exists.

Personnel working at the task site must use safe work practices, report unsafe working conditions or acts, and exercise good housekeeping habits with respect to tools, equipment, and waste throughout the course of the project.

2.5 Site Inspections

Project personnel may participate in site inspections during the work-control preparation stage (such as the hazard identification and verification walkdowns), and they may conduct self-assessments or other inspections.

During operations, targeted or required self-assessments may be performed in accordance with MCP-8, "Performing Management Assessments and Management Reviews." Health and safety professionals present at the task site may recommend changes in work habits at any time. However, all changes that could affect the work control documents must have concurrence from the appropriate project technical representatives, and a data analysis report must be prepared, when required.

3. EXPOSURE MONITORING AND SAMPLING

Monitoring and sampling will be used throughout project operations to (1) assess the effectiveness of engineering controls, (2) determine the appropriate PPE requirements for individual tasks, and (3) determine the need for upgrading and downgrading PPE, as described in Section 5. Monitoring with direct-reading and mobile instruments will be conducted to provide health and safety professionals with real-time and trending data to assess the effectiveness of control measures.

Tables provided in this section present the strategy for conducting exposure monitoring and sampling. These include the following:

- Table 3-1, tasks and hazards to be monitored, frequency, and monitoring instrument category
- Table 3-2, monitoring instrument category and description
- Table 3-3, action levels and associated responses for project operational hazards.

Table 3-1. Tasks and hazards to be monitored, frequency, and monitoring instrument category.

Tasks	Hazard(s) to be Monitored[a]	Instrument Category to be Used
• Perform a visual and geophysical survey for UXO. • Sample and analyze removed soil to determine disposition. • Manually segregate fragments of TNT and RDX from the soil. • Dispose of the TNT and RDX fragments by detonation at the MDA. • Perform hand and mechanical excavation and field screening. • Collect confirmatory soil samples. • Backfill excavated areas and revegetate.	Radionuclide contamination—(alpha, beta, and gamma)	2
	Chemical and nonradiological constituents and hazardous atmospheres	3 and 4
	Respirable dust—silica and other particulates of concern	3 and 5
	Hazardous noise	6
	Ergonomics, repetitive motion, and lifting	7
	Heat and cold stress	8

a. Based on specific tasks and site conditions, monitoring and sampling will be conducted as deemed appropriate by project Industrial Hygiene and RadCon personnel.

MDA = Mass Detonation Area
RadCon = radiological control
RDX = Royal Demolition Explosive
TNT = trinitrotoluene
UXO = unexploded ordnance

Table 3-2. Monitoring instrument category and description.

Instrument Category	Instrument Category Number Description[a]
2	Alpha: Count rate—Bicron/NE Electra (DP-6 or AP-5 probe) or equivalent
	Beta-gamma: Count rate—Bicron NE/Electra (DP-6 and BP-17 probes) or equivalent
	Grab sampler—SAIC H-810 or equivalent
3	Organic vapor: Direct-reading instruments (photoionization detector, flame ionization detector, or infrared detector), detector tubes, or grab samples
	Dust: Direct-reading instrument (optical particle counter or equivalent)
4	Organic vapors and other airborne constituents, particulate, or hazardous atmospheres: Personal sampling pumps with appropriate media for partial- and full-period sampling using NIOSH- or OSHA-validated methods, direct-reading instruments, or remote-sensing detectors
5	Silica dust, respirable: NIOSH 7500 or equivalent, personal sampling pump, 10-mm cyclone, or full-period sampling
6	ANSI Type S2A sound-level meter or ANSI S1.25-1991 (ANSI 2002) dosimeter (A-weighted scale for time-weighed average dosimetry and C-weighted scale for impact-dominant sound environments)
7	Observation and ergonomic assessment of activities will be performed in accordance with MCP-2692, "Ergonomics Program," and *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (ACGIH 2003).
8	Heat stress: Wet-bulb globe temperature, body weight, and fluid intake
	Cold stress: Ambient air temperature and wind chill charts

a. Equivalent instrumentation other than those listed may be used.

ACGIH = American Conference of Governmental Industrial Hygienists
ANSI = American National Standards Institute
BEI = biological exposure index
MCP = management control procedure
NIOSH = National Institute for Occupational Safety and Health
OSHA = Occupation Safety and Health Administration
SAIC = Science Applications International Corporation
TLV = threshold limit value

Table 3-3. Action levels and associated responses for project operational hazards.

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded
Nonradiological nuisance particulates (insoluble or poorly soluble—not otherwise specified)	>10 mg/m^3 (inhalable fraction) >3 mg/m^3 (respirable fraction)	1. Substitute equipment or change method to reduce emissions at source. 2. Verify engineering control operation (where in place), or institute engineering controls (such as closed cabs for equipment operators). 3. Evaluate air movement (wind) conditions and reschedule tasks, or reposition personnel to upwind position of source. 4. Move operation to alternate location (with engineering controls, if possible). 5. Use wetting or misting methods to minimize dust and particulate matter. 6. IF wetting or misting methods prove ineffective, THEN don respiratory protection[a] (as directed by IH).
Nonradiological airborne contaminant (chemical, dust, fume, fiber, or particulate)	Based on individual contaminant exposure limit (ACGIH TLV [ACGIH 2003] or OSHA PEL) and 29 CFR 1910 substance-specific requirements. Generally, sustained levels at the TLV or PEL in the worker's breathing zone for 2 minutes should be used as the action limit. Use these values where short-term exposure limits, ceiling values, or OSHA substance-specific action limit exist.	1. Substitute equipment or change method to reduce emissions at source. 2. Verify engineering control operation (where in place) or institute engineering controls (such as closed cabs for equipment operators). 3. Evaluate air movement (wind), and reschedule tasks or reposition personnel to upwind position of source. 4. Move operation to alternate location (with engineering controls, if possible). 5. IF engineering and administrative controls do not control contaminant below exposure limit, THEN reevaluate engineering and administrative controls or don respiratory protection[a] (as directed by IH). 6. IF OSHA substance-specific standard action limit is exceeded, THEN initiate applicable medical surveillance requirements.

Table 3-3. (continued).

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded
Nonradiological hazardous atmosphere Chemical IDLH, oxygen deficient, oxygen enriched, 10% of chemical LEL	As defined by MCP-2749, confined spaces are based on criteria such as oxygen level, individual contaminant IDLH value, and LEL. **NOTE:** *No entry into an area or space containing a hazardous atmosphere is permitted without the authorization of the project operations manager, or representative, in conjunction with health and safety professionals. This authorization will be demonstrated through the use of approved operational procedures or other work control documents in conjunction with a confined space entry permit.*	1. Eliminate hazardous atmosphere through the use of engineering controls or natural ventilation. 2. Reschedule operations when area or space will not have hazardous atmosphere. 3. Evaluate space or area to be entered. IF the operation can be conducted outside the area or space, THEN perform operation without entry. 4. Measure atmosphere before initiating operation or personnel entry, and verify acceptable entry conditions have been met (e.g., oxygen and LEL) and use engineering controls to maintain safe atmosphere and below specified exposure limit. Use the permit system to authorize entry. 5. IF engineering control fails to control contaminant below safe atmospheric and exposure limit, THEN stop operation and evacuate personnel until safe atmosphere and specified entry conditions can be achieved. 6. IF IDLH atmosphere must be entered, THEN don appropriate air-supplied respiratory protection (with escape capacity) and protective clothing.[a] At least one stand-by person dressed in proper PPE must be present for each entrant. **NOTE:** *The INEEL fire department also must be notified for any area or space entry into an IDLH atmosphere to ensure that adequate rescue equipment and resources are in place.*

Table 3-3. (continued).

Contaminant or Agent Monitored	Action Level		Response Taken if Action Level is Exceeded	
Hazardous noise levels	<85 dBA 8-hour TWA or equivalent TWA for 10- or 12-hour exposure		No action	
	85 to 114 dBA or equivalent TWA for 10- or 12-hour exposure		1. Substitute equipment with lower noise-generating type. 2. Isolate noise source, or place sound-absorbing barrier in noise path. 3. Hearing protection required to attenuate hazard to below 85 dBA 8-hour TWA or equivalent TWA for 10- or 12- hour exposure (device NRR).	
	(a) >115 dBA	(b) >140 dBC	(a) Isolate source; evaluate NRR for single device, double protection as needed.	(b) Control entry around source and isolate source. No exposure to continuous, intermittent, or impact noise in excess of a peak 140 dBC level.
Radiological	As defined in PRD-183, *INEEL Radiological Control Manual*		Training, posting, and PPE as required in the PRD-183, *INEEL Radiological Control Manual*	
Other facility or INEEL alarms	Facility or INEEL site alarm		See Section 10.6, "Personnel Roles, Lines of Responsibility, and Training," for emergency response action following facility or INEEL alarms.	

a. Respiratory protection and clothing as prescribed by the project IH and RadCon personnel (based on contaminant of concern). See Section 5, "Personal Protective Equipment," for additional PPE requirements.
b. PRD-183, *INEEL Radiological Control Manual*
c. Access requirements may be deleted or modified if personnel access is specifically prohibited.
d. For radioactive spills involving highly toxic chemicals, workers should immediately exit the area without attempting to stop or secure the spill. They should then promptly notify the IH or INEEL HAZMAT team and project RadCon personnel.

ACGIH = American Conference of Governmental Industrial Hygienists
CFR = Code of Federal Regulations
dBA = decibel A-weighted
dBC = decibel C-weighted
HAZMAT = hazardous material
IDLH = immediately dangerous to life or health
IH = industrial hygienist
INEEL = Idaho National Engineering and Environmental Laboratory
LEL = lower exposure limit
MCP = management control procedure
NRR = noise reduction rating
OSHA = Occupational Safety and Health Administration
PEL = permissible exposure limit
PPE = personal protective equipment
PRD = program requirements document
RadCon = radiological control
TLV = threshold limit value
TWA = time-weighted average

Industrial Hygiene and Radiological Control (RadCon) personnel (if radionuclides are encountered) will conduct environmental and personnel monitoring with direct-reading instrumentation, swipes, and full- and partial-period air sampling, in accordance with the applicable MCPs, OSHA substance-specific standards, and as stated on the RWP (where required). Instrumentation will be selected based on the site-specific conditions and contaminants associated with project tasks. The IH and radiological control technician (RCT) (if required) will be responsible for determining the best monitoring technique for radiological and nonradiological contaminants, respectively. Safety hazards and other physical hazards will be monitored and mitigated, as outlined in Section 2.

3.1 INDUSTRIAL HYGIENE AREA AND PERSONAL MONITORING AND INSTRUMENT CALIBARTION

The project IH will conduct full- and partial-period sampling of airborne contaminants and monitoring of physical agents, as listed on Table 3-1 and as deemed appropriate. When conducted, all air sampling will be conducted using applicable National Institute of Occupational Safety and Health (NIOSH), OSHA, or other validated methods. Both personal and area sampling and monitoring may be conducted.

Various direct-reading instruments may be used to determine the presence of nonradiological and other physical agents. The frequency and type of sampling and monitoring will be determined by changing site conditions, direct-reading instrument results, observation, and professional judgment and in accordance with the MCP-153, "Industrial Hygiene Exposure Assessment."

All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing Industrial Hygiene protocol, and *Manual 14A–Safety and Health–Occupational Safety and Fire Protection* (Safety and Fire Protection Department 2004a) and *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene* (Safety and Fire Protection Department 2004b). Direct-reading instruments will be calibrated, at a minimum, before daily use and more frequently as determined by the project IH. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded as stated in Section 12, "Record-Keeping Requirements."

3.2 AREA RADIOLOGICAL MONITORING AND INSTRUMENT CALIBRATION

The five sites contaminated with TNT and RDX are not radiologically controlled areas. If radiological contamination is encountered or sites with known radionuclides are added under the scope of Phase II activities, then radiological monitoring will be conducted to ensure that personnel are given adequate protection from potential radiological exposure. Where required, the RCT may use instruments and sampling methods as deemed appropriate and as required by project- or task-specific RWPs. When conducted, monitoring will be performed in accordance with *Manual 15B–Radiation Protection Procedures* (Radiation Protection Department 2004a) and *Manual 15C–Radiological Control Procedures* (Radiation Protection Department 2004b). The RadCon personnel will use data obtained from monitoring to evaluate the effectiveness of engineering controls, decontamination methods, and procedures and to alert personnel to potential radiation sources.

When required, RadCon personnel will be responsible for choosing the appropriate radiological survey equipment. Daily operational and source checks will be performed on all portable survey instruments to ensure that the instruments are within the specified baseline calibration limits. Accountable radioactive sources will be maintained in accordance with MCP-137, "Radioactive Source Accountability and Control." All radiological survey and monitoring equipment will be maintained and calibrated in

accordance with the manufacturer's recommendations, existing RadCon protocol, and in conformance with MCP-93, "Health Physics Instrumentation."

4. ACCIDENT AND EXPOSURE PREVENTION

Project activities will present numerous safety hazards to personnel conducting these tasks. It is critical that all personnel understand and follow the site-specific requirements of this HASP and adhere to the standard operating procedures and technical requirements mentioned in Section 1.5, "Scope of Work." Engineering controls, hazard isolation, specialized work practices, and the use of PPE will be implemented to eliminate or mitigate all potential hazards and exposures, where feasible. However, all personnel are responsible for identifying and controlling hazards in their work area in accordance with Integrated Safety Management System (ISMS) principles and practices (PDD-1004). **At no time will hazards be left unmitigated without implementing some manner of controls (e.g., engineering controls, administrative controls, or the use of PPE).** Project personnel should use stop work authority in accordance with MCP-553, "Stop Work Authority," where it is perceived that imminent danger to personnel, equipment, or the environment exists.

This HASP should be used in conjunction with PRD-25, "Activity Level Hazard Identification, Analysis, and Control," and work authorization and control documents (such as STD-101, "Integrated Work Control Process"; work orders; JSAs; MCP-3562, "Hazard Identification, Analysis, and Control of Operational Activities"; and operational technical procedures). Where appropriate, MCP-3562, GDE-6212, mitigation guidance, JSAs, and RWPs will be used.

4.1 Voluntary Protection Program and Integrated Safety Management System

The INEEL safety processes embrace the Voluntary Protection Program (VPP) (PRD-5119) and ISMS criteria, principles, and concepts to identify and mitigate hazards, thereby preventing accidents. All management and workers are responsible for implementing safety policies and programs and for maintaining a safe and healthful work environment. Project personnel are expected to take a proactive role in preventing accidents, ensuring safe working conditions for themselves and fellow personnel, and complying with all work control documents, procedures, and permits.

The **ISMS** is focused on the **system** side of conducting operations, and **VPP** concentrates on the **people** aspect of conducting work. Both programs define work scope, identify and analyze hazards, and mitigate the hazards; additional information on these programs is available on the INEEL Intranet. Bechtel BWXT Idaho, LLC, (the current primary management and operating contractor) and its subcontractors participate in VPP and ISMS for the safety of their employees. This document includes all elements of both systems. The six key elements of VPP and ISMS and their corresponding HASP sections are shown in Table 4-1.

Table 4-1. The six key elements of the Voluntary Protection Program and the Integrated Safety Management System and their corresponding health and safety plan section.

Voluntary Protection Program	Integrated Safety Management System	Health and Safety Plan Section
—	Define work scope	Section 1
Work site analysis	Analyze hazards	Sections 2, 3, 5, and 8
Hazard prevention and control	Develop and implement controls	Sections 2, 3, 4, 5, 7, 10, and 11
Safety and health training	Perform within work controls	Sections 6
Employee involvement	Perform work within controls	Sections 2, 3, and 4
Management leadership	Provide feedback and improvement	Sections 6 and 9

4.2 General Safe-Work Practices

Sections 1 and 2 defined the project scope of work and associated project-specific hazards and mitigation. The following practices are mandatory for all project personnel to further reduce the likelihood of accidents and injuries. All visitors permitted to enter work areas must follow these requirements. Failure to follow these practices could result in permanent removal from the project and other disciplinary actions.

- Work area access will be limited to authorized personnel only.
- All personnel have the authority to initiate STOP WORK actions in accordance with MCP-553, "Stop Work Authority."
- Personnel will not eat, drink, chew gum or tobacco, smoke, apply sunscreen, or perform any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials in project work areas. Designated eating and drinking areas will be established.
- Be aware of and comply with all safety signs, tags, barriers, and color codes in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."
- Be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and spills that might be present. Report all potentially dangerous situations to the senior UXO supervisor or HSO.
- Avoid direct contact with hazardous materials or UXO. Personnel will not walk through spills or other areas of known ordnance explosive contamination and will avoid kneeling, leaning, or sitting on equipment or surfaces that might be contaminated.
- Be familiar with the physical characteristics of the project site, including, but not limited to, the following:
  - Prevailing wind direction
  - Location of fellow personnel, equipment, and vehicles
  - Communications at the project site and with nearest the facility
  - Major roads and means of access to and from the project site
  - Location of emergency equipment
  - Warning devices and alarms for the area or facility
  - Capabilities and location of nearest emergency assistance.
- Report all broken skin or open wounds to the HSO. An Occupational Medical Program (OMP) physician must examine all wounds to determine the nature and extent of the injury. If the duties of a worker who has a wound involve entering a radiological contamination area, a RadCon supervisor will determine whether the wound can be bandaged adequately in accordance with Article 542 of PRD-183, *INEEL Radiological Control Manual*.

- Ground-fault protection will be provided whenever temporary wiring (i.e., extension cord) is used. Cords must be rated in accordance with PRD-5099, "Electrical Safety."

- Keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments.

- Follow all safety and radiological precautions and limitations of technical procedures and requirements identified in work packages.

4.3 Subcontractor Responsibilities

Subcontractors are responsible for meeting all applicable INEEL MCP, PRD, VPP, and ISMS flow-down requirements such as those listed on the completed INEEL Form 540.10, "Subcontractor Requirements Manual Applicability"; *Subcontractor Requirements Manual* (Project and Construction Management Department 2004); and contract general and special conditions. In addition, subcontractors are expected to take a proactive role in hazard identification and mitigation while conducting project tasks; subcontractors must report unmitigated hazards to the appropriate project point of contact after taking actions to mitigate the situation within the documented work controls.

4.4 Buddy System

The two-person system, or buddy system, will be used during project tasks. The buddy system requires each employee to assess and monitor his or her buddy's mental and physical well-being during the course of the operation. A buddy must be able to perform the following activities:

- Provide assistance if required

- Verify the integrity of PPE

- Observe his or her buddy for signs and symptoms of heat stress, cold stress, or contaminant exposure

- Notify other personnel in the area if emergency assistance is needed

- Perform additional responsibilities as assigned by the senior UXO supervisor.

5. PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to shield or isolate personnel from radiological, nonradiological, physical, and biological hazards that cannot be eliminated though engineering or other controls. It is important to realize that no single PPE ensemble can protect against all hazards under all conditions, and proper work practices and adequate training will serve to augment PPE to provide the greatest level of protection to workers.

This section provides guidance for selecting and using PPE to be worn for project tasks and contingencies for upgrading and downgrading PPE. Generally, types of PPE are divided into two broad categories: (1) respiratory protection equipment and (2) personal protective clothing. Both of these categories are incorporated into the standard four levels of protection (Levels A, B, C, and D).

The type of PPE will be selected, issued, used, and maintained in accordance with PRD-5121, "Personal Protective Equipment." Selection of the proper PPE is based on the following considerations:

- Specific conditions and nature of the tasks
- Potential contaminant routes of entry
- Physical form and chemical characteristics of hazardous materials
- Toxicity of hazardous materials that might be encountered
- Duration and intensity of exposure (acute or chronic)
- Compatibility of chemical(s) with PPE materials and potential for degradation or breakthrough
- Environmental conditions (e.g., humidity, heat, cold, and rain)
- The hazard analysis (Section 2) evaluation of this HASP.

Modified Level D equipment is all that is required when performing UXO activities, based on the above-listed criteria. Though not anticipated, a full- or half-face respirator fitted with a particulate filter or chemical cartridge (Level C) also may be worn, as determined by the IH or HSO, based on monitoring results.

5.1 Personal Protective Equipment Levels

The following sections provide general guidance on typical hazardous waste operations and emergency response (HAZWOPER) levels of PPE. Project operational activities will be evaluated to determine the most appropriate type of PPE, which may or may not incorporate traditional HAZWOPER levels. Additional PPE requirements may be specified in the RWP, SWP (where required), and JSAs.

Table 5-1 lists PPE items typically included for the two traditional HAZWOPER levels of PPE. Assigned project safety and health professionals, in consultation with RadCon personnel (if radiological hazards are encountered), will determine these PPE-level ensemble requirements based on the hazards present, monitoring results, and nature of the operational task. Modifications to PPE levels will be made based on changing operational conditions and monitoring results. Such modifications are routinely employed to maximize efficiency and to meet operational-specific needs without compromising personnel safety and health.

Table 5-1. Levels and options of personal protective equipment.

Personal Protective Equipment Level	Personal Protective Equipment Required[a]	Optional Personal Protective Equipment or Modifications
D	Coveralls or standard work clothes (coverall material type based on Industrial Hygiene determination) Hardhat (unless working indoors with no overhead or falling debris hazards) meeting ANSI Z89.1 requirements (ANSI 2003a) Eye protection (safety glasses meeting ANSI Z87.1 requirements [ANSI 2003b] as a minimum) Hand protection (material based on type of work and hazardous materials being handled) Safety footwear (steel or protective toe and shank) meeting ANSI Z41 (ANSI 1999) requirements or sturdy leather above the ankle for construction tasks	Chemical or radiological protective clothing by IH or RCT Chemical-resistant hand and foot protection (e.g., inner and outer gloves and boot liners) Any specialized protective equipment (e.g., hearing protection, gloves, face shields, welding goggles, and aprons)
C	Level D ensemble with the following respiratory and whole-body protection upgrades:[b] • Half or full face piece air-purifying respirator equipped with a NIOSH-approved HEPA filter or chemical and HEPA combination cartridge (IH to specify cartridge type) • Standard Tyvek (or equivalent) coverall OR • Chemical-resistant coveralls (e.g., Tyvek or coated Tyvek; IH to specify material)	Chemical-resistant outer shoe or boot cover (IH or RCT to specify material) Inner chemical-resistant gloves with cotton liners (as determined by the IH and RWP) Outer chemical-resistant gloves (as determined by the IH) Any specialized protective equipment (e.g., hearing protection, welding lens, and aprons) (Safety glasses are not required if wearing a full-face respirator.)

a. The IH or RCT may modify the PPE ensemble to provide protection for the skin or from other physical hazards.
b. The IH in conjunction with other environment, safety, and health professionals will determine the upgrades.

ANSI = American National Standards Institute
HEPA = high-efficiency particulate air
IH = industrial hygienist
NIOSH = National Institute of Occupational Safety and Health
PPE = personal protective equipment
RCT = radiological control technician
RWP = radiological work permit

5.1.1 Level D Personal Protective Equipment

Level D PPE will only be selected for protective clothing and not for project tasks with respiratory or skin absorption hazards requiring whole-body protection. Level D PPE provides no protection against airborne chemical hazards; however, Level D PPE is used for protection against surface contamination and physical hazards. Level D PPE will serve as the primary PPE level for the five sites, unless additional hazards are encountered or monitoring indicates exposure levels exceeding the action limits.

Level D PPE is appropriate for use during all UXO activities when personnel are not expected to be exposed to airborne explosive materials at concentrations above the threshold limit value (TLV) or permissible exposure limit (PEL) (see Table 2-2 for a list of the TLVs and PELs for potential chemical hazards).

The Level D PPE required for UXO tasks under this HASP include the following:

- Coveralls or street clothes
- Hard hat
- Safety glasses with side shields
- Sturdy leather boots with steel- or composite-reinforced toe
- Leather gloves when handling ordnance or shrapnel
- Hearing protection during detonation activities.

Level C PPE upgrades that may be implemented by the IH, RCT, or HSO include the following:

- Nitrile gloves when handling explosive compounds or materials contaminated with explosive compounds
- Respiratory protection
- Anti-contamination clothing as required by RWP (if written).

All personnel required to wear respirators will complete training and be fit-tested before being assigned a respirator in accordance with the training and documentation requirements in Section 6, "Personnel Training." Requirements for respirator use, emergency use, storage, cleaning, and maintenance—as stated in MCP-2726, "Respiratory Protection"—will be followed.

If radiological contamination is encountered at levels requiring the use of anti-contamination clothing, a task-specific RWP will be developed, and MCP-432, "Radiological Personal Protective Equipment," will be followed.

The project HSO, in consultation with the project IH (and RadCon personnel, as applicable), will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE based on changing site conditions or activities is a normal occurrence.

NOTE: Personnel must inspect all PPE before donning. Items found to be defective or that become unserviceable during use will be doffed and disposed of in accordance with posted procedures and will be placed in the appropriate waste stream (as applicable).

5.1.2 Level C Personal Protective Equipment

Level C PPE will be worn when the task site (chemical or radiological) contaminants have been well-characterized, thereby indicating that (1) personnel are protected from airborne exposures by wearing an air-purifying respirator with the appropriate cartridges, (2) no oxygen-deficient environments exist (less than 19.5% at sea level), and (3) no conditions exist that are immediately dangerous to life or health (IDLH).

5.2 Upgrading and Downgrading Personal Protective Clothing

The assigned IH and RadCon (if assigned) personnel will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE based on changing operational conditions (e.g., equipment, waste types, and location of tasks) is a normal occurrence. If changing conditions are encountered, work control documents (e.g., work order, RWP, and JSA) might require updating to reflect these changes or might require augmentation by an SWP. Additional reasons for upgrading or downgrading PPE are listed below.

5.2.1 Upgrading Criteria for Personal Protective Equipment

The level of PPE required will be upgraded for the following reasons, and work will halt until PPE upgrading has been completed:

- Identification of new, unstable, or unpredictable hazards or exposures
- Temporary loss or failure of any engineering controls
- Presence of contaminants that present difficulty in monitoring or detecting
- Known or suspected presence of skin absorption hazards
- Anticipation of newly identified source or potential increasing concentration of respiratory hazard(s)
- Change in operational activity that could result in increased contact with contaminants or trigger any of the criteria listed above.

5.2.2 Downgrading Criteria for Personal Protective Equipment

The level of PPE will be downgraded under the following conditions:

- Elimination of hazard or completion of operational task(s) requiring specific PPE
- Implementation of new engineering or administrative controls that eliminate or significantly mitigate the hazard

- Sampling information or monitoring data that show contaminant levels to be stable and lower than initial or estimated levels
- Elimination of potential skin absorption or contact hazards.

5.3 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected before use and when in use during project activities, in accordance with PRD-5121, "Personal Protective Equipment." Once PPE is donned, self-inspection will serve as the principal form of inspection. If PPE should become damaged or degradation or permeation is suspected, the individual wearing the PPE will inform others of the problem and proceed directly to the work area's exit point. Following required surveys, PPE will be doffed and replaced. In addition, all PPE that becomes grossly contaminated or that presents a potential source for the spread of such contamination will be required to be decontaminated or replaced.

Table 5-2 provides a general inspection checklist for common PPE items. Not all PPE ensemble items listed may be required for project tasks. Where specialized protective clothing or respiratory protection is used or required, the manufacturer's inspection requirements in conjunction with regulatory or industry inspection practices will be followed. The assigned project IH, safety professional, or RCT (where required) should be consulted about specific PPE inspection criteria.

Table 5-2. Inspection checklist for personal protective equipment.

Personal Protective Equipment Item	Inspection
Level D and C clothing	Before use: • Visually inspect for imperfect seams, nonuniform coatings, and tears. • Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks. While wearing in the work zone: • Inspect for evidence of chemical attack such as discoloration, swelling, softening, and material degradation. • Inspect for tears, punctures, and zipper or seam damage. • Check all taped areas to ensure that they are still intact.
Gloves	Before use: • Pressurize rubber gloves to check for pinholes by blowing in the glove then closing off and rolling up glove until air is trapped; then inspect. No air should escape. Leather gloves: • Inspect seams and glove surface for tears and splitting, and verify no permeation has taken place.

Table 5-2. (continued).

Personal Protective Equipment Item	Inspection
Respirators (half or full face piece air-purifying)	Before use: • Verify that respirator is within 3 years of shelf life. • Check condition of the face piece, head straps, valves, connecting lines, fittings, and all connections for tightness. • Check cartridge to ensure that the proper type or combination is being used for atmospheric hazards to be encountered, and inspect threads and O-rings for pliability, deterioration, and distortion.

PPE = personal protective equipment

6. PERSONNEL TRAINING

All INEEL personnel will receive training, as specified in 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and INEEL manuals. Table 6-1 summarizes the project-specific training requirements. Based on changing field conditions, modifications (e.g., additions or deletions) of training requirements listed in Table 6-1 might be necessary. The HSO—with concurrence from the senior UXO supervisor, project manager, RCT, and IH (as applicable)—will approve any changes to the requirements listed in Table 6-1. These changes should be based on site-specific conditions; generally, the changes will be considered minor changes to the HASP, as defined by instructions from Form 412.11, "Document Management Control Systems (DMCS) Document Action Request (DAR)," because they are administrative in nature.

6.1 General Training

All project personnel are responsible for meeting training requirements, including applicable refresher training. Evidence of training will be maintained at the project site, field administrative location, or electronically (e.g., Training Records and Information Network [TRAIN] [INEEL 2001]). Nonfield team personnel and visitors must be able to provide evidence of meeting required training for the area of the site they wish to access before being allowed into a project area. As a minimum, all personnel who access project locations must receive a HAZWOPER site-specific briefing, wear PPE, and provide objective evidence of having completed INEEL computer-based PPE training (00TRN288, "Personal Protective Equipment") or equivalent, in accordance with 29 CFR 1910.132, "General Requirements."

A trained HAZWOPER 8-hour supervisor will monitor the performance of each newly trained, 24-hour or 40-hour trained worker to meet the 1 or 3 days of supervised field experience, respectively, in accordance with 29 CFR 1926.120(e). Following the supervised field experience period, the supervisor will complete Form 361.47, "HWO Supervised Field Experience Verification," or equivalent, to document the supervised field experience.

NOTE 1: Supervised field experience is only required if personnel have not previously completed this training at another Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) site (documented) or if they are upgrading from 24- to 40-hour HAZWOPER training. A copy of the training record must be available electronically in TRAIN or at the project site as evidence of training.

NOTE 2: Completed supervised field experience training forms (Form 361.47 or equivalent) should be submitted to the project training coordinator for inclusion in TRAIN.

6.2 Project-Specific Training

Before beginning work at the project site, field team members will receive project-specific HASP training that will be conducted by the HSO (or designee). This training will consist of a complete review of (1) a controlled copy of the project HASP, attachments, and DARs; (2) applicable JSA, SWP, and RWP (if required); (3) work orders; and (4) other applicable work control and work authorization documents, with time for discussion and questions. Project-specific training can be conducted in conjunction with, or separately from, the required formal prejob briefing (MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback").

Table 6-1. Required project-specific training.

Required Training	Senior UXO Supervisor	HSO, UXO Specialist	Other Field Team Members	Access into the Designated or Controlled Work Area
HAZWOPER Site Orientation[a]				Yes
40-hour HAZWOPER[b] Operations	Yes	Yes	c	c
24-hour HAZWOPER[a] Operations			c	c
8-hour HAZWOPER Supervisor	Yes			
Project-specific Health and Safety Plan Training[d]	Yes	Yes	Yes	Yes
Fire Extinguisher Training (or equivalent)	Yes	Yes	e	
CPR, Medic First Aid	Yes	Yes	e	
PPE Use Training	Yes	Yes	Yes	Yes
Hearing Conservation	Yes	Yes	f	f
Military EOD School Graduate (or equivalent)	Yes	Yes		
HAZMAT Employee General Awareness Training	g	g	g	
At Least 10 Years EOD Experience	Yes			
Radiological Worker I or II	h	h	h	h
Respirator Training (contingency only)	i	i	j	j

NOTE: Shaded fields indicate specific training is not required or applicable.

a. Includes project-specific hazard communications (29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response"), site access and security, and decontamination and emergency response actions, as required by 29 CFR 1910.120(e).

b. Includes 8-hour HAZWOPER refresher training (as applicable) and supervised field experience as follows: 40-hour HAZWOPER = 24-hour supervised field experience, and 24-hour HAZWOPER = 8-hour supervised field experience.

c. The HSO will determine the 40-hour or 24-hour HAZWOPER training requirement, based on the nature of project tasks and potential for exposure to contaminants or safety hazards.

d. Training will include all required 29 CFR 1910.120(e) elements and a UXO safety briefing.

e. Senior UXO supervisor and HSO will determine appropriate number of personnel requiring training.

f. As required, in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise." Consult with IH.

g. If identified as HAZMAT employee, i.e., anyone who directly affects hazardous material transportation safety by handling, packaging, labeling, loading, unloading, moving, or driving (in accordance with the requirements of 49 CFR 171.8, "Definitions and Abbreviations").

h. If entry into radiological areas occurs, then Radiological Worker Training will be required (according to RCT and RWP).

i. It is only required if entering an area requiring respiratory protection.

j. Nonfield workers will not be allowed into areas requiring respiratory protection.

CFR = Code of Federal Regulations
CPR = cardiopulmonary resuscitation
EOD = explosive ordnance disposal
HAZMAT = hazardous material
HAZWOPER = hazardous waste operations and emergency response
HSO = health and safety officer
IH = industrial hygienist
MCP = management control procedure
PPE = personal protective equipment
RCT = radiological control technician
RWP = radiological work permit
UXO = unexploded ordnance

At the time of project-specific HASP training, personnel training records will be checked and verified to be current and complete for all the training requirements shown in Table 6-1 (if not already verified). After the HSO (or designee) has completed the site-specific training, personnel will sign Form 361.25, "Group Read and Sign Training Roster," or equivalent, indicating that they have received this training; understand the project tasks, associated hazards, and mitigations; and agree to follow all HASP and other applicable work control and safety requirements. Form 361.25 (or equivalent) training forms are available on the INEEL Intranet under "Forms."

6.3 Plan-of-the-Day Briefing, Feedback, and Lessons Learned

The senior UXO supervisor or designee will conduct a daily plan-of-the-day (POD) meeting (or equivalent). During this meeting, daily tasks will be outlined; hazards will be identified; hazard controls, mitigation, and work zones will be established; PPE requirements will be discussed; and feedback from personnel will be solicited. At the completion of this meeting, any new work control documents will be reviewed and signed (e.g., SWP, JSA, or RWP).

NOTE: If a formal MCP-3003 prejob briefing is conducted during the work shift, then a POD is not required.

Particular emphasis will be placed on lessons learned from the previous workday's activities and how tasks can be completed in the safest, most efficient manner. All personnel are encouraged to contribute ideas to enhance worker safety and mitigate potential exposures at the project sites. This POD will be conducted as an informal meeting, and no documentation beyond noting the POD in the field team leader logbook or sampling logbook is required.

Safety and health topic-specific training or safety meetings also may be conducted during the course of the project to reinforce key safety topics. They may be conducted by project safety and the IH or any field team member and should be performed in conjunction with the POD. Credit for a safety meeting can be received for such topic-specific training if a tailgate training form (INEEL Form 361.24, "Tailgate Attendance Roster," or equivalent) is completed and submitted to the appropriate training coordinator for entry into TRAIN.

7. SITE CONTROL AND SECURITY

Site control and security will be maintained at the project locations during all activities to prevent unauthorized personnel from entering the work area. Entry into and exit from these areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."

The senior UXO supervisor and HSO should be consulted regarding equipment layout at the project site to minimize personnel hazards from equipment. The equipment layout at the project site should reflect the nature of the hazard presented and should be mitigated through the use of engineering controls (barriers, guards, and isolation), administrative controls (roped-off restricted areas or controlled entry access), and qualifications of operators and those assisting in the operation of the equipment, when required.

Good housekeeping will be maintained at all times during the course of the project. This includes maintaining working and walking surfaces to minimize tripping hazards, stacking or storing materials and equipment in a central location when not in use, and regularly cleaning up debris and trash at the project site.

Based on the nature of the project tasks to be completed, a graded approach with two types of site control designations (work areas) will be used to meet HAZWOPER site control requirements. These work areas are based on the potential hazards, complexity of work tasks, duration of project tasks, and location and number of nonproject personnel near the project area. The two types of work areas are as follows:

- Designated work areas (DWAs) (established for low-hazard routine tasks)
- Controlled work areas (CWAs) (established for higher-hazard tasks).

The primary differences between the work areas will be the size of the area, method of delineation, and postings, as determined by the activity being conducted and associated hazards. The senior UXO supervisor in conjunction with the HSO and RadCon personnel (where radiological concerns exist) will determine the type of work area to be established.

Personnel not directly involved with project activities will be excluded from entering these work areas. Visitors may be admitted into work areas provided that they (1) are on official business, (2) have received site-specific training or orientation (Table 6-1) by the senior UXO supervisor or designee, and (3) have met all the site-specific training requirements for the area they have a demonstrated need to access.

NOTE: During certain tasks, visitors may not be allowed into the MDA or controlled work areas to minimize risks to workers and visitors. The senior UXO supervisor in consultation with the HSO will make the final determination as to whether a visitor may enter a controlled work area.

All potential hazards will be evaluated when delineating each work area location and size. Barriers (e.g., rope, cones, and printed ribbon) may be used for delineation and demarcation. Where warranted, designated traffic routes also may be established. In addition, these areas will be posted to prevent inadvertent entry by unauthorized personnel.

7.1 Designated Work Area

The established DWAs will consist of the area immediately around the work area, including all equipment. Typically, the DWA's boundary will be marked with cones or stanchions. Generally, the DWA's boundary will not be delineated with rope or ribbon or include other demarcation. All personnel who enter the DWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 5, "Personal Protective Equipment." All DWAs will be delineated and posted with the appropriate signage based on the hazard being controlled, in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes." Visitors who do not have appropriate training or PPE to access the DWA, or as determined by the senior UXO supervisor, will be restricted from entering.

7.2 Controlled Work Area

The CWAs will be large enough to encompass the equipment and nature of the tasks being conducted to prevent personnel not assigned to the project task and visitors from being exposed to potential safety and health hazards associated with the project tasks. This type of work area will be established where a more restrictive area is required based on increased hazards. The boundary of the CWA may be marked with a combination of stanchions or posts and delineated with rope or ribbon, and the boundary may include warning signs or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the CWA. The CWA will be a controlled area during all project tasks, and an entry and exit point will be established at the CWA's periphery to regulate the flow of personnel and equipment. All personnel who enter the CWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 5, "Personal Protective Equipment."

During all detonation activities, the MDA will be treated as a CWA. All visitors will remain at the visitor staging area located at the barricade on the access roadway or at an alternate location chosen by the senior UXO supervisor. Only essential workers will be allowed inside the MDA. The senior UXO supervisor has final authority in determining which field team members may enter the MDA. Visitors may not enter the MDA during operational activities.

7.3 Control and Security of Unexploded Ordnance

The UXO and detonation explosives will be handled, transported, and controlled at all times in accordance with DOE M 440.1-1, *DOE Explosives Safety Manual*, and PLN-320, "Transport Plan for the Shipment of Explosive Materials within the Boundaries of the INEEL."

7.4 Site Security

Where controlled work areas are established, the project site will be delineated with rope and adequate signage to prevent unauthorized personnel from entering the area. Access to the MDA is controlled with a fence. In addition, INEEL security forces provide site security of the INEEL.

NOTE: Signs are routinely lost because of high winds; however, these signs will be replaced as soon as possible the next working day following discovery.

7.5 Wash Facilities and Designated Eating Areas

Ingestion of hazardous substances is possible when workers use poor personal hygiene. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. Smoking, chewing, eating, and drinking are not allowed inside the DWA or CWA. The designated wash facility or area with portable hand washing station will be determined before each project and will be discussed in the prejob briefing. Given the location of the WAG 10 sites, the CFA cafeteria (CFA-1612) will serve as the designated eating area and wash facility.

7.6 Designated Smoking Area

Smoking will only be permitted in designated smoking areas due to the high fire potential at the ordnance sites, and personnel will comply with all INEEL smoking policies, including disposing of smoking materials in the proper receptacle. The senior UXO supervisor will be the single point of contact for establishing any smoking area. Smoking areas may not be permitted at certain times of the year because of high or extreme fire danger.

8. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

Project personnel will participate in the INEEL Occupational Medical Surveillance Program (or equivalent subcontractor program), as required by DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees," and 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." Medical surveillance examinations will be provided (where required) before assignment, annually, and after termination of HAZWOPER duties or employment. Medical surveillance of the following personnel is required:

- Personnel who are, or may be, exposed to hazardous substances at or above the OSHA PEL, or published exposure limits, without regard to respirator use for 30 or more days per year
- Personnel who are injured, become ill, or develop signs or symptoms because of possible overexposure involving hazardous substances or agents during an emergency response or hazardous waste operation
- Personnel who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, "Respiratory Protection"
- Personnel assigned to a hazardous material (HAZMAT) or emergency response team.

Personnel who wear a respirator while doing their job, or who are required to take respirator training to do their duties under this plan, must participate in the medical evaluation program for respirator use at least annually, as required by MCP-2726, "Respiratory Protection."

A single copy of the project HASP, job hazard analysis requirements, required PPE, confined space entry requirements (as applicable), and other exposure-related information will be made available upon request to the INEEL OMP physician (and subcontractor physicians) conducting medical surveillance of personnel assigned to this project. Exposure monitoring results and hazard information furnished to the physician will be supplemented or updated annually as long as the worker is required to meet a hazardous waste and material employee medical surveillance requirement.

A documented medical clearance (e.g., a physician's written opinion) will be provided to the worker and line management stating whether the worker has any detected medical condition that would place him or her at increased risk of health impairment from working in hazardous waste operations, emergency response operations, respirator and other PPE-required-use areas, and confined space areas (as applicable). The physician may impose restrictions on the worker by limiting the amount and type of work performed or PPE that can be worn.

Personnel are responsible for communicating any work or medical restrictions to their supervisor so that work assignments can be modified if necessary. During the MCP-3003 prejob briefing, the supervisor conducting the briefing should ask workers if they have any work restrictions. However, it is the employee's responsibility to inform the supervisor of any work or medical restrictions.

NOTE: All managers, supervisors, and foreman have access to employees' current medical restrictions, certifications, and surveillances through the OMP database on the Safety and Health homepage or OMP reports link: http://webhome4/OMPReports/. This allows management to review medical restrictions, surveillances, and certifications before assigning work tasks to employees.

8.1 Subcontractor Workers

Subcontractor project personnel will participate in a subcontractor medical surveillance program that satisfies the applicable requirements of 29 CFR 1910.120. Where medical surveillance is required, the program must make medical examinations available before assignment, annually, and after termination of hazardous waste duties as stated above. The physician's written opinion, as defined by 29 CFR 1910.120(f)(7) (or equivalent), will serve as documentation that subcontractor personnel are fit for duty, and the written opinion will list work restrictions.

Medical data from the subcontractor employee's private physician, collected pursuant to hazardous material worker qualification, will be made available to the INEEL OMP physicians upon request.

8.2 Injuries on the Site

It is the INEEL's policy that an INEEL OMP physician examine all injured personnel, including the following:

- A worker who is injured at the project site
- A worker experiencing signs and symptoms consistent with exposure to a hazardous material
- A worker believed to have been exposed to a hazardous substance, physical agent, or radiological hazard in excess of allowable limits during the course of a project at the INEEL.

NOTE: In the event of an illness or injury, the decision to provide first aid and transport to the nearest medical facility or whether to immediately request an ambulance and continue to stabilize and provide first aid should be based on the nature of the injury or illness and likelihood that transporting the individual could cause further injury or harm. Most likely, the person making this decision will only be trained to the medic first aid/cardiopulmonary resuscitation (CPR) level and should contact the CFA medical facility at 777 or 526-1515 for further guidance if there is any question as to the extent of injury or potential for further harm by movement of the injured individual.

In the event of a known or suspected injury or illness caused by exposure to a hazardous substance or physical or radiological agent, the worker will be transported to the nearest INEEL medical facility for evaluation and treatment, as necessary. The HSO and senior UXO supervisor are responsible for obtaining as much of the following information as is available to accompany the worker to the medical facility:

- Worker name, job title, work (site) location, and supervisor's name and phone number
- Nature of the incident and injury or exposure and associated signs or symptoms of exposure
- Substance, physical or radiological agent exposed to (known or suspected), and material safety data sheet, if available
- First aid or other measures taken
- Exact location of the worker, including route to sites and potential hazards

- Locations, dates, and results of any relevant personal or area exposure monitoring or sampling
- List of PPE worn during this work (e.g., type of respirator and cartridge used).

Further medical evaluation will be determined by the treating or examining physician in accordance with the signs and symptoms observed, hazard involved, exposure level, and specific medical surveillance requirements established by the OMP director in accordance with the requirements of 29 CFR 1910.120.

NOTE: In the event of an illness or injury, subcontractor employees will be taken to the closest INEEL medical facility (if doing so will not cause further injury or harm) or transported by INEEL ambulance to have an injury stabilized before transport to the subcontractor's treating physician or off-Site medical facility.

The proper facility representative will be notified if any injury or illness occurs within a facility boundary. Most ordnance locations are outside facility boundaries and, thus, fall under the jurisdiction of the CFA site area director. If the ordnance removal site happens to fall under the jurisdiction of a facility other than CFA, the emergency contact for the facility will be announced during the prejob briefing or daily POD meeting. As soon as possible after an injured employee has been transported to the INEEL medical facility, the senior UXO supervisor or designee will make additional project notifications as indicated in Section 10, "Emergency Response Plan."

8.3 Substance-Specific Medical Surveillance

No contaminants (listed in 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances") with substance-specific standards have been identified at TNT and RDX project sites. If new contaminants of concern are identified during the course of project tasks, exposures will be evaluated and quantified to determine whether a substance-specific standard and associated medical surveillance requirements apply. If regulatory-mandated substance-specific standard action levels are triggered, then affected personnel will be enrolled in applicable substance-specific medical surveillance programs.

9. KEY SITE PERSONNEL RESPONSIBILITIES

This project's organizational structure reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the public. Key project positions, lines of responsibility, and communication are shown on the organization chart (Figure 9-1) and are limited to the field level. This organization chart is not all-inclusive but shows the structure for key resources assigned to complete project tasks. The "Project Execution Plan for the Balance of INEEL Cleanup Project" (PLN-694) provides details on the roles and responsibilities for Balance of INEEL Cleanup (BIC) personnel above the project manager level. The following text outlines the responsibilities of key site personnel.

9.1 Balance of Idaho National Engineering and Environmental Laboratory Cleanup Project and Project Management

The following positions and associated roles and responsibilities are described in PLN-694:

- BIC manager of projects
- BIC Project safety, health, and quality assurance manager
- WAG manager
- Project engineer
- Environmental Compliance support
- Quality engineer.

9.1.1 Project Manager

The project manager is responsible for developing and managing the project and coordinating BIC project operations. The project manager ensures that all project activities are conducted in accordance with INEEL and regulatory requirements and ensures that tasks comply with PLN-694 and this HASP. The project manager is responsible for the overall work scope, schedule, and budget for this project and reports to the WAG manager.

9.1.2 Environmental Compliance Support

Environmental Compliance support personnel oversee, monitor, and advise the project manager and senior UXO supervisor performing site activities on environmental issues and concerns by ensuring compliance with DOE orders, U.S. Environmental Protection Agency regulations, and other regulations concerning the effects of site activities on the environment. The BIC Project's Environmental Compliance support personnel provide support surveillance for hazardous waste storage and transportation, and surface water/storm water run-off control.

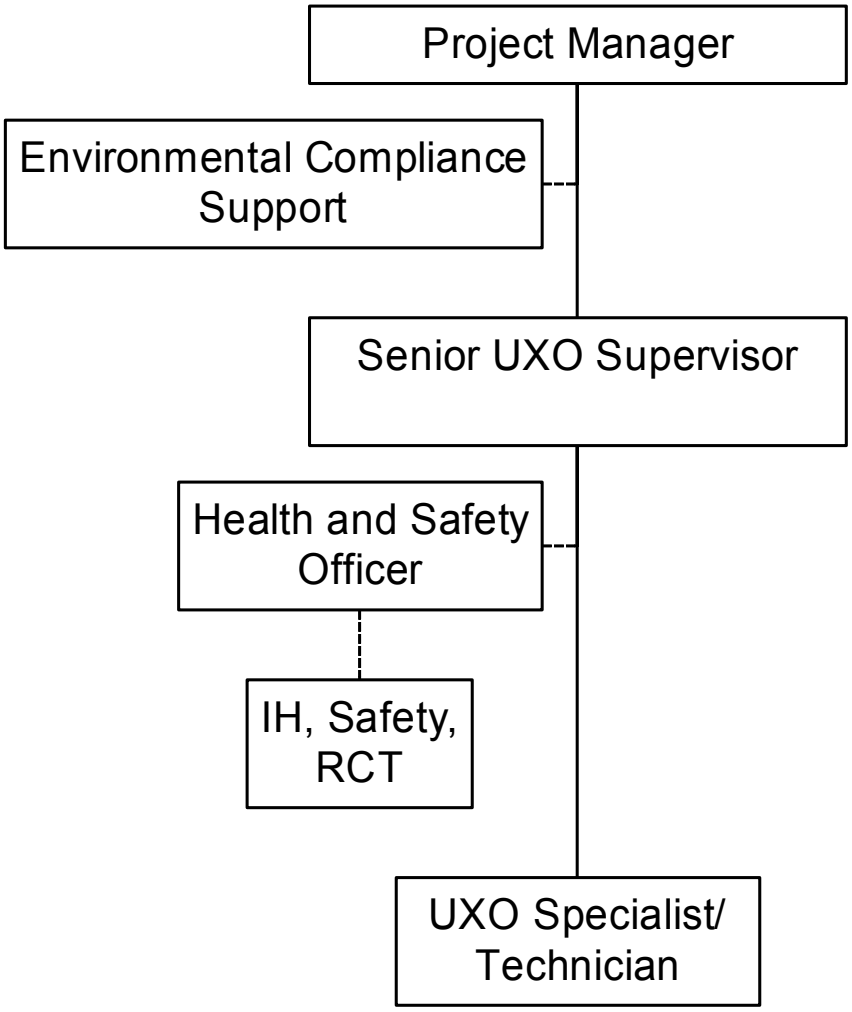


Figure 9-1. Organization chart.

9.2 Task Site Responsibilities

9.2.1 Unexploded Ordnance Personnel

The UXO personnel must be U.S. citizens and graduates of the U.S. Army Bomb Disposal School at the Aberdeen Proving Ground, Maryland, or the U.S. Naval Explosive Ordnance Disposal School at Indian Head, Maryland, or Eglin Air Force Base, Florida. The UXO personnel must never have been removed from an EOD assignment for personnel reliability reasons or unsatisfactory performance of duties, substantiated by official documentation. Credit for EOD experience in National Guard or Reserve Units will be based on the actual documented time spent on active duty, not on the total time of service.

9.2.1.1 Senior Unexploded Ordnance Supervisor. The senior UXO supervisor is in charge of all fieldwork. The senior UXO supervisor is the field supervisor for personnel assigned to work at the site. The senior UXO supervisor works to accomplish day-to-day operations at the work site, identify and obtain additional resources needed at the site, and interact with the IH, safety engineer, RCT (where required), and HSO on matters regarding safety and health. The senior UXO supervisor must be informed about any health and safety issues that arise at the work site, and he or she may stop work at the site if an

unsafe condition exists. The senior UXO supervisor also shares the responsibility for daily prejob briefings.

The senior UXO supervisor has the ultimate responsibility for UXO procedural and safety decisions and compliance. The senior UXO supervisor shall be onsite during all UXO field operations.

The senior UXO supervisor shall have served at least 10 years in military EOD assignments, to include at least 5 years in supervisory EOD positions. Three years of documented civilian contractor UXO experience may be substituted for 3 years of active duty military EOD experience. This individual must have documented experience supervising multiteam operations involving range clearance actions. This individual shall have pertinent experience with the type of explosive ordnance expected to be encountered at the site.

9.2.1.2 Health and Safety Officer. The HSO is the person assigned to the task site who serves as the primary contact for all health and safety issues. The HSO advises the senior UXO supervisor on all aspects of health and safety. The HSO also is authorized to stop work at the task site if any operation threatens worker or public health or safety. The HSO is authorized to verify compliance to the HASP, conduct inspections and self-assessments, require and monitor corrective actions, and monitor decontamination procedures (as appropriate). The safety, health, and quality-assurance professionals at the task site (e.g., safety professional, IH, environmental coordinator, and facility representative) support the HSO.

Persons assigned as the HSO or alternate HSO must be qualified (in accordance with the definition in 29 CFR 1910.120) to recognize and evaluate hazards, and he or she will be given the authority to take or direct actions to ensure that workers are protected. Typically, the senior UXO supervisor also will be the project HSO because of EOD training and experience requirements.

If it is necessary for the HSO to leave the site, the HSO will appoint an alternate individual to fulfill this role, and that individual's identity will be communicated to project personnel. If no other personnel on the job site can meet the training and experience requirements for the alternate HSO, then work will cease until a qualified HSO is present.

9.2.1.3 Unexploded Ordnance Specialist/Technician. The UXO specialist reports to the senior UXO supervisor and performs all UXO field tasks, including excavation, identification, and disposal of UXO by detonation. The UXO specialist can serve as a supervisor of a small work unit. This individual shall have more than 3 years active military EOD experience. A UXO specialist may be a UXO assistant with at least 5 years combined military EOD and contractor UXO experience.

9.2.2 Industrial Hygienist

The assigned IH is the primary source of information about exposure assessments for the project chemical, physical, and biological hazards at the task site. The IH assesses the potential for worker exposures to hazardous agents in accordance with INEEL safety and health manuals, MCPs, and industry-accepted industrial hygiene practices and protocol. By participating in project planning, the IH assesses and recommends appropriate hazard controls to protect site personnel, operates and maintains airborne sampling and monitoring equipment, reviews engineering controls for effectiveness, and recommends and assesses the use of PPE required in this HASP (recommending changes as appropriate).

9.2.3 Safety Professional

The assigned safety professional reviews work packages, observes site activity, assesses compliance with the INEEL safety and health manuals, advises the senior UXO supervisor on required

safety equipment, and recommends solutions to safety issues and concerns that arise at the task site. The safety professional may conduct periodic inspections in accordance with MCP-3449, "Safety and Health Inspections," and have other duties at the task site as specified in other sections of this HASP or in PRDs and MCPs. Copies of any safety and health inspections will be kept in the project field file.

9.2.4 Radiological Control Technician

If required, the assigned RCT will serve as the primary source of information and guidance on radiological hazards that might be encountered during project tasks and on controls necessary to mitigate them. Responsibilities of the RCT include the following:

- Performing radiological surveying of the site, equipment, and samples
- Providing guidance for radioactive decontamination of equipment and personnel
- Accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radionuclide contamination occurs.

The RCT must notify the senior UXO supervisor and HSO of any radiological occurrence that must be reported, as directed by PRD-183, *INEEL Radiological Control Manual*.

9.2.5 Fire Protection Engineer

A fire protection engineer provides technical guidance to the HSO and senior UXO supervisor about all fire protection issues. In addition, the fire protection engineer may be assigned to review the work packages and conduct preoperational and operational fire hazard assessments. The fire protection engineer is required to sign all safe work permits used as hot work permits within the jurisdiction of the facility site area director. The INEEL fire department also must be notified and made available for detonation activities in the MDA.

9.2.6 Specialty Subcontractors

Specialty subcontractors may be used to support EOD operations. A subcontractor lead may be appointed to serve as the single point of contact for all subcontractor communication at the site and report to the senior UXO supervisor for all technical direction and interface issues at the project site. Subcontractor personnel will report any health and safety issues that arise to the senior UXO supervisor or HSO and may stop work if an unsafe condition exists. The subcontractor lead also will be asked to provide hazard and mitigation information about the nature of the subcontractor's equipment or operations during the POD meeting, and he or she may participate in job-site hazard walkdowns.

9.2.7 Field Team Personnel

All field team personnel, including CFA operators and subcontractor support personnel assigned to the project, will understand and comply with the requirements of this HASP. As described in Section 6, the senior UXO supervisor (or designee) will conduct a formal prejob briefing or POD at the start of each shift. Once at the project site, field team personnel are responsible for identifying any potentially unsafe situations or conditions to the senior UXO supervisor or HSO for corrective action.

9.2.8 Nonfield Team Personnel

As defined by this HASP, all persons who may be at a project site and not part of the field team (e.g., surveyors or others not assigned a field team support role) are considered nonfield team personnel.

Nonfield team personnel are considered occasional site workers in accordance with 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and must receive site-specific HASP training before entering work areas at the project site, unless there is no potential for exposure and all safety hazards are mitigated (e.g., during downtime). In such a case, a site orientation briefing as described in Section 9.2.9, "Visitors," is required before nonfield team personnel are granted access to the area.

9.2.9 Visitors

All visitors with official business at the project site (including INEEL personnel and representatives of DOE and state or federal regulatory agencies) may only proceed into a designated or controlled work area after meeting the required training defined in Table 6-1.

If there is no potential for exposure to chemical, radiological, or safety hazards (e.g., downtime) a visitor may be escorted at the project site after receiving a site orientation consisting of the following:

- An overview of the work areas at the site and access restrictions
- Inherent site hazards (e.g., terrain and equipment) and mitigating actions or avoidance
- Required PPE for entry to the site (must be trained to wear required PPE)
- Emergency action to take in case of a take-cover alarm, evacuation alarm, or other site emergency.

NOTE: To minimize risks to workers and visitors, visitors may not be allowed into the MDA or controlled work areas during certain tasks. The senior UXO supervisor in consultation with the HSO will make the final determination as to whether a visitor may enter a controlled work area.

Where access is allowed, a fully trained task-site representative (e.g., senior UXO supervisor or HSO) will escort visitors when entering controlled areas of the project site.

A casual visitor to the task site is a person who does not have a specific task to perform or other official business to conduct at the project site. **Casual visitors are not permitted in work areas at any project site.**

10. EMERGENCY RESPONSE PLAN

This emergency response plan defines the roles and responsibilities of project personnel during an emergency. Such an emergency could be at a WAG 10 project site, at a facility or collocated facility, or a Sitewide emergency. The intent of this section is to provide project-specific emergency response actions to meet 29 CFR 1910.120 requirements. Details of the INEEL Emergency Response Organization are available in the "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114). The overall process developed to respond to and mitigate consequences of emergencies that might arise at the INEEL is described in that plan.

The "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114) may be activated in response to events occurring at a project site, at the INEEL, or at the discretion of the emergency coordinator or emergency action manager. Once PLN-114 is activated, project personnel will follow the direction and guidance communicated by the emergency coordinator.

NOTE: U.S. Department of Energy Orders 151.1B, "Comprehensive Emergency Management System," and 231.1A, "Environment, Safety, and Health Reporting," classify an emergency differently than the OSHA HAZWOPER standard definition. For this reason, the term "emergency event" will be used in this section when referring to a project HAZWOPER emergency.

10.1 Preplanning for an Emergency

The "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114) provides the basis for preplanning all INEEL emergency events. That base plan is supplemented with INEEL facility-specific addenda. Such preplanning makes it possible for the INEEL to anticipate and appropriately respond to abnormal events that can affect the project. Preplanning also ensures that the Project Emergency Response Program is integrated with the INEEL contingency plans. Specific procedures for addressing emergency events and actions to be taken are further described in applicable facility-specific emergency procedures. This emergency response plan addresses project-specific planning requirements to meet project needs.

10.2 Emergency Preparation and Recognition

The HASP sections for hazard identification and mitigation (Section 2) and accident prevention (Section 4) provide the strategy that will be followed at project sites to prevent accidents. Similarly, emergency preparation and recognition will require operations personnel to be constantly alert for hazardous situations and signs and symptoms of chemical exposure or releases. All project personnel should be familiar with the techniques for hazard recognition and the associated response, including proper operational notifications. Emergency phone numbers and evacuation route maps will be located throughout project operational areas.

Preparation and training on emergencies will include proper project access and egress procedures in response to project operational events and INEEL emergencies, as part of the HASP training and project operations area access training (where applicable). In addition, visitors will receive a briefing on emergency procedures and a general operations orientation (Table 6-1) and may have to complete HASP training depending on the project operations area to be accessed. The visitor emergency actions briefing will include information regarding responses to various alarms, location and use of communication equipment, location of Site emergency equipment, and evacuation.

The requirements in MCP-2725, "Field Work at the INEEL," for training, emergency actions, and notifications will be followed for all projects conducted outside facility boundaries.

On-scene response to and mitigation of operational emergencies could require the expertise of INEEL fire department and medical personnel. Emergencies that could occur include the following:

- Accidents resulting in injury
- Fires
- Spills of hazardous or radiological materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Safeguard and security emergencies
- Emergencies at nearby facilities that could prompt evacuation or take-cover actions at the task site.

10.3 Emergency Facilities and Equipment

Emergency response equipment maintained at the project site includes the items listed in Table 10-1. The INEEL fire department maintains an emergency hazardous material response van that can be used to respond to an event or emergency at the project. Fire department personnel also are trained to respond immediately to hazardous material spills and medical emergencies. In addition, the CFA-1612 medical facility is manned by medical personnel to evaluate and stabilize injured personnel or those experiencing signs and symptoms of exposure.

Table 10-1. Emergency response equipment to be maintained at the project site during operations.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection or Verification
First-aid kit	One in each project vehicle	HSO	Monthly: check seal only, unless broken.
Eyewash bottles[a] Eyewash station[a]	In or near DWA or CWA	HSO	Monthly
Hazardous materials spill kit	Project vehicle	HSO	Daily verification
Communication equipment	Onsite	Senior UXO supervisor	Daily radio check (if radios are used)
Fire extinguishers, 10A/20BC	One and smaller ABC extinguisher in each project vehicle, as a minimum	HSO	Monthly

a. An eyewash bottle will be used to provide an immediate eye flush, if required. The HSO will inform personnel of the location of the eyewash station during the prejob briefing.

CWA = controlled work area
DWA = designated work area
HSO = health and safety officer
UXO = unexploded ordnance

10.4 Emergency Communications and Notifications

In the event of an emergency, the capability to summon INEEL emergency response resources, immediately notify site personnel, and inform others of site emergencies is required. Communications equipment at the task site may include a combination of radios, telephones (e.g., mobile, cellular, or facility), and pagers. Communication methods described below will be used during emergencies.

During emergencies, the Warning Communications Center (WCC) will be notified of any project emergency event. The WCC will then make the required Emergency Response Organization notification. The following information should be communicated, as available, to the WCC:

- The caller's name, title (e.g., senior UXO supervisor or HSO), telephone number, and pager number
- Exact location of the emergency
- Nature of the emergency, including time of occurrence, current site conditions, and special hazards in the area
- Injuries (if any) including numbers of injured, types of injuries, and conditions of injured
- Emergency response resources required (e.g., fire, hazardous material, and ambulance).

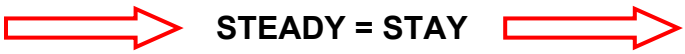
10.5 Emergency Alerting, Responses, and Sheltering

Alarms and signals are used at the project site and the INEEL to notify personnel of abnormal conditions that require a specific response. Responses to these alarms are addressed in general employee training. Emergency sirens located throughout the INEEL serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. A separate set of emergency signals has been established based on horn blasts (e.g., vehicle or air horn) to signal site personnel of a project-site emergency event.

Depending on the field location, facility alarms may not be able to be heard at the project site. If a WAG 10 project site is outside the audible range of the facility alarms, then the notification to take cover or evacuate should be received on the field radio, mobile or cellular phone, or pager. The project-site emergency signals will be used to alert personnel to take emergency actions.

10.5.1 Take Cover—Continuous Siren

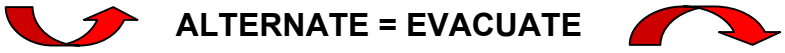
Radiation or hazardous material releases, adverse weather conditions, or other event or emergency conditions could require that all personnel take cover indoors in the nearest building. A TAKE COVER protective action may be initiated as part of a broader response to an emergency, and it may precede an evacuation order. The order to TAKE COVER is usually announced by activating the emergency siren. The signal to take cover is a CONTINUOUS SIREN.



However, the order to take cover also can be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER, project personnel will place the site and equipment in a safe configuration (as appropriate) and then seek shelter in a project vehicle. Eating, drinking, and smoking are not permitted during take-cover conditions.

10.5.2 Total Area Evacuation—Alternating Siren

A total area evacuation is the complete withdrawal of personnel from the project site and the entire facility area. The evacuation signal is an ALTERNATING SIREN. When ordered to EVACUATE, project personnel will place equipment and the site in a safe configuration (as appropriate) and then proceed along the specified evacuation route to the designated assembly area or as directed by the emergency coordinator.



For total area evacuations, facility command posts are activated, and all personnel will gather at the appropriate primary facility evacuation assembly area or, if outside a facility, the location designated by the emergency coordinator or senior UXO supervisor. The senior UXO supervisor or trained alternate will then complete the personnel accountability using the site attendance log. In this situation, the senior UXO supervisor will report the results of the accountability process to the WCC or the facility emergency coordinator or area warden (if inside a facility).

10.5.3 Project Site Evacuation—Vehicle Horn Blast

A project site evacuation is the complete withdrawal of personnel from the project site, but it does not require the complete evacuation of the entire facility (if the site is located within a facility) or INEEL Site area. A single long horn blast (e.g., vehicle) will serve as the project's primary emergency evacuation signal (as listed on Table 10-2). However, the order to evacuate also can be given by word of mouth, radio, or voice paging system. When ordered to evacuate the project site, personnel will place the site and equipment in a safe condition and then proceed along the specified evacuation route to the designated project-site assembly area or as directed by the senior UXO supervisor. Eating, drinking, and smoking are not permitted during emergency evacuations.

Table 10-2. Project internal emergency signals.

Device or Communication Method	Signal and Associated Response
Vehicle horn blasts	One long blast—Emergency evacuation. Evacuate project site immediately. Proceed in an upwind direction to the designated assembly area, as specified by the senior UXO supervisor. Two short blasts—Nonemergency evacuation of immediate work area. Proceed to the designated assembly area, as specified by the senior UXO supervisor. Three long blasts or verbally communicated—All clear, return to project site.

UXO = unexploded ordnance

10.6 Personnel Roles, Lines of Authority, and Training

10.6.1 The Idaho National Engineering and Environmental Laboratory Emergency Response Organization

The Emergency Response Organization structures are based on the incident command system and are described in PLN-114, "INEEL Emergency Plan/RCRA Contingency Plan," and facility-specific addenda to that plan.

10.6.2 Role of Project Personnel in Emergencies

Depending on the emergency event, a graded response and subsequent notifications will take place. Senior UXO supervisor and project personnel responsibilities are described below. Personnel will respond to emergencies only within the limits of their training and designated by their position. Emergency response actions also will be covered as part of the HASP briefing.

Currently, all TNT and RDX sites to be remediated are located outside any facility boundary, thus qualifying as fieldwork under MCP-2725, "Field Work at the INEEL." The CFA site area director has jurisdiction over this fieldwork. If additional sites identified for remediation are located within an INEEL facility's area of jurisdiction, the appropriate facility emergency contacts will be notified. Where these requirements apply, they will be addressed during the prejob briefing or POD.

10.6.2.1 Senior Unexploded Ordnance Supervisor. The senior UXO supervisor (or designated alternate) is responsible for initiating all requests for emergency services (e.g., fire and medical) and for notifying the WCC (as applicable) of abnormal (or potential emergency) events that occur during the project. The senior UXO supervisor also may serve as the area warden (or designate that responsibility to another person who has been trained as area warden) and may conduct personnel accountability. In addition, the senior UXO supervisor will control the scene until a higher-tiered incident-command system authority arrives at the scene to take control. When relinquishing this role, the senior UXO supervisor (or designated alternate) will provide all information about the nature of the event, potential hazards, and other information requested.

10.6.2.2 Project Personnel. Every person at the project site has a role to play during a project emergency event or INEEL emergency. Each worker must be constantly aware of potential dangers or unexpectedly hazardous situations and must immediately report these situations to the senior UXO supervisor. All personnel are expected to watch out for their fellow workers, report their concerns to the senior UXO supervisor, and take emergency actions as described in this section. Specific roles and responsibilities are further detailed in Table 10-3.

10.6.2.3 Personnel Accountability and Area Warden. Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and project site evacuation alarms. In all cases, the senior UXO supervisor (or trained alternate) will serve as the area warden for the project and will complete the personnel accountability (following positive sweeps of the project site) based on the attendance log. The results of this accountability will then be reported to the WCC, shift supervisor, site area director, or emergency coordinator (if the command post has been formed), as applicable.

Table 10-3. Responsibilities during an emergency.

Responsible Person	Action Assigned
Senior UXO supervisor (or designee)	Signal an evacuation.
	Report spill to WCC and appropriate spill notification personnel, and take actions to mitigate the situation.
	Contact the WCC.
Senior UXO supervisor (or trained designee)	Serve as area warden, conduct accountability, and report to the WCC, shift supervisor, site area director, or emergency coordinator (as applicable).
HSO, medic, and first-aid trained personnel	Administer first aid to victims (voluntary basis only).

HSO = health and safety officer
UXO = unexploded ordnance
WCC = Warning Communications Center

10.6.2.4 Spills. If the material spilled is known and is small enough to be safely contained at the task site, then project personnel will control the spill using spill supplies at the site and will immediately report the event to the WCC. The WCC or the facility shift supervisor or equivalent (if inside a facility) will determine additional reporting requirements in accordance with MCP-190, "Event Investigation and Occurrence Reporting." If any release of a hazardous material occurs, project personnel will comply with the following immediate spill response actions.

10.6.2.4.1 Untrained Initial Responder—Perform the following if the initial responder is untrained, if the material characteristics are unknown, or additional PPE is required:

- Place equipment in a safe configuration
- Notify the senior UXO supervisor
- **Evacuate** to upwind direction, and **isolate** the immediate area
- **Notify** WCC or designated facility contact, and **warn** others in the area.

10.6.2.4.2 Trained Responder—Perform the following where material characteristics are known and no additional PPE is required:

- Place all equipment in a secure configuration
- Notify the senior UXO supervisor
- **Stop** the spill if it can be done without risk (e.g., returning the container to the upright position, closing valve, and shutting off power)
- **Secure** any release paths if safe to do so
- **Notify** WCC or designated facility contact, and **warn** others in the area.

10.7 Medical Emergencies and Decontamination

Medical emergencies and responses to injuries or suspected exposures will be handled as stated in Section 8.2, "Injuries on the Site." Decontamination of personnel and equipment is described in Section 11.2, "Equipment and Personnel Decontamination."

10.8 Evacuation Assembly Areas and Central Facilities Area Medical Facility

Since project remediation activities and detonations will be conducted outside of a facility, the INEEL evacuation routes listed in PLN-114 will be used. Evacuation assembly areas will be discussed during the prejob briefing. Figure 10-1 shows the location of the CFA Medical Facility (CFA-1612).

10.9 Reentry, Recovery, and Site Control

All reentry and recovery activities will follow general site security and control requirements identified in Section 7, "Site Control and Security," unless conducted as part of an emergency response action or if initiated based on UXO hazards. The on-scene commander with technical support from the senior UXO supervisor will control all entries to the project site performed in support of emergency actions.

10.9.1 Reentry

During an emergency response, it is sometimes necessary to reenter the scene of the event. Reasons for reentry include the following:

- Perform personnel search and rescues
- Respond to medical first-aid needs
- Perform safe shutdown actions
- Perform mitigating actions
- Evaluate and prepare damage reports
- Perform radiation or hazardous material surveys.

Reentries will be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning is undertaken as a graded approach, depending on the nature of the initiating event and as directed by the on-scene commander.

10.9.2 Recovery

After the initial emergency actions have been taken and effective site controls have been established, response efforts will shift toward recovery. Recovery is the process of assessing postevent and postemergency conditions and developing a plan for returning to preevent and preemergency conditions, when possible, and following the plan to completion. The on-scene commander is responsible for determining when an emergency is sufficiently stable to terminate the emergency and enter the recovery phase. The project manager, with concurrence from the site area director, will appoint the recovery manager.

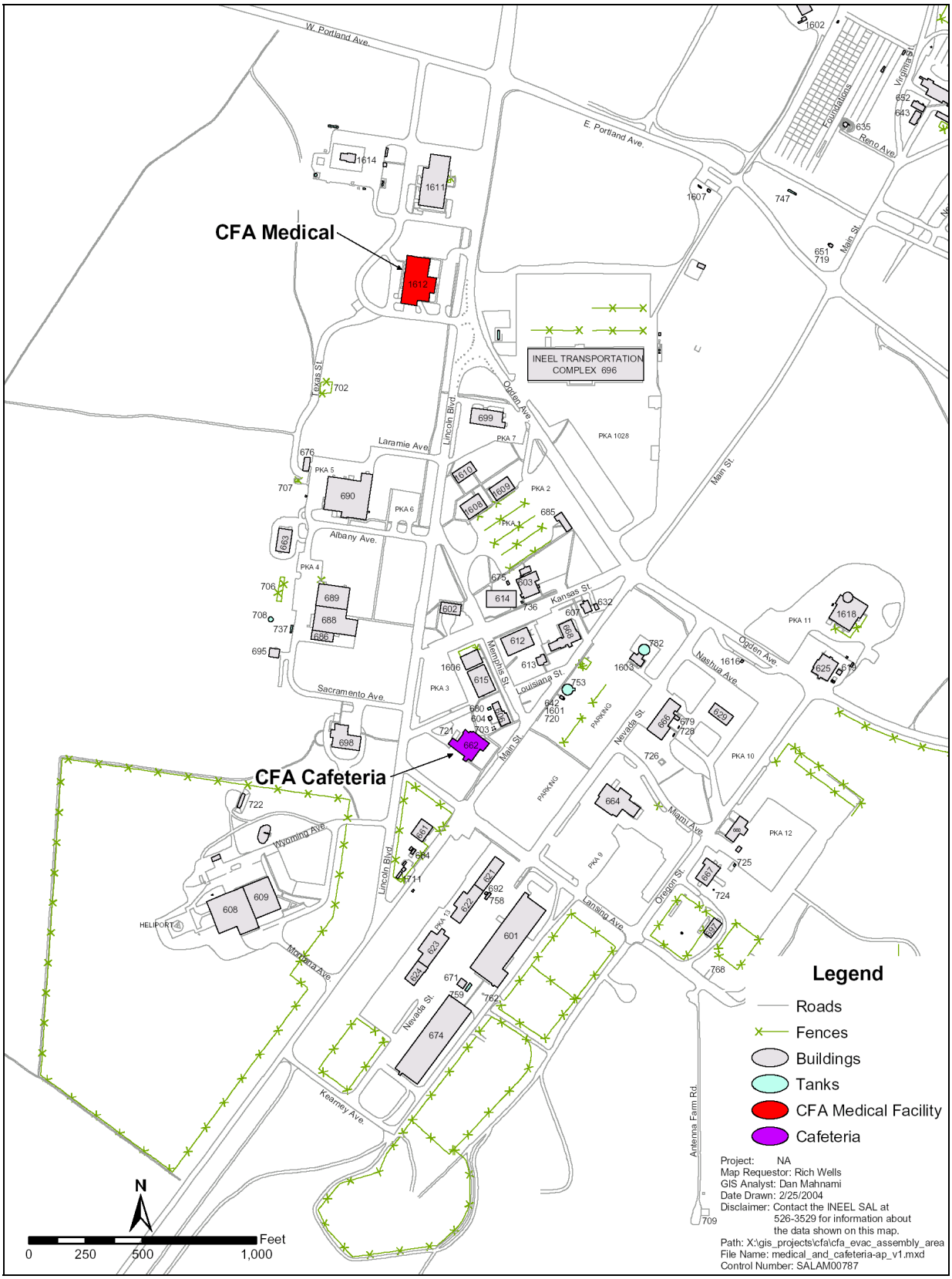


Figure 10-1. Map showing the location of the Central Facilities Area Medical Facility (CFA-1612).

10.10 Critique of Response and Follow Up

A review and critique will be conducted following all project emergency events, drills, and exercises at the INEEL. In some cases, an investigation might be required before commencing recovery actions. For this reason, care should be exercised to preserve evidence.

10.11 Telephone and Radio Contact Reference List

Table 10-4 lists the general points of contact for the project. Because personnel listed might change frequently, working copies of this list will be generated to note new positions and changes of assigned personnel. This HASP should not be revised with a DAR (Form 412.11) to note these changes.

Table 10-4. Project emergency contact list.

Contact Title	Contact Name	Phone Number or Radio Net	Cellular Phone Number	Pager Number
WCC, fire, medical emergency, and security	—	777 526-1515	—	—
CFA site area director	Steven L. Winn	6-1075	520-6013	5494
Manager of projects BIC Project	Michael J. Graham	6-2945	521-0182	—
Project manager	Michael P. Hodel	6-9684	—	6698
Senior UXO supervisor	Hanceford E. Clayton	6-8197	521-8404	7557
Health and safety officer	Hanceford E. Clayton	6-8197	521-8404	7557
Safety professional	Kerry D. Briar	6-5506	—	6627
WAG 10 safety and health point of contact	Kerry D. Briar	6-5506	—	6627
Industrial hygienist	Lance W. Gurney	6-3600	520-1530	3531
BIC Project safety, health, and quality assurance lead	Mark T. Langlois	6-2160	520-1297	9042
WAG 10 environmental compliance	Scott L. Reno	6-5778	520-0271	—

BIC = Balance of INEEL Cleanup
CFA = Central Facilities Area
UXO = unexploded ordnance
WAG = waste area group
WCC = Warning Communications Center

11. DECONTAMINATION PROCEDURES

Radiological and chemical contamination is not expected during the course of the TNT and RDX remediation addressed by this HASP. However, if chemical or radiological contamination is encountered at levels requiring decontamination, this section provides guidance on how it will be performed.

11.1 Contamination Control and Prevention

Contamination-control and -prevention procedures will be implemented to minimize personnel contact with surfaces contaminated by ordnance explosives when such surfaces are or might be encountered during project tasks. Where these surfaces are encountered, engineering controls, protective barriers, protective clothing, and modified work control practices will be used or hold points and surveys will be added to minimize direct contact with contaminated surfaces.

11.2 Equipment and Personnel Decontamination

Personnel and equipment decontamination procedures are necessary to control contamination and protect personnel where soil is contaminated with ordnance explosive and if soil contaminated with radionuclides is encountered. Explosive-contaminated soil on equipment or protective clothing will be physically removed and decontaminated from surfaces before the equipment and clothing can leave the site, based on a graded approach. If significant amounts of such soil must be removed from heavy equipment, then the HSO and project IH will evaluate the decontamination measures, on a case-by-case basis, to determine the most appropriate level of PPE to be worn.

If radionuclide decontamination is required for equipment or areas, it will be performed in accordance with Chapter 4 of PRD-183, *INEEL Radiological Control Manual*. If radiological contamination is encountered, then an RWP that specifies required PPE and monitoring will be generated. Specific equipment and personnel decontamination methods are provided below.

11.2.1 Equipment Decontamination

A decontamination pad may be established if large-scale ordnance-explosive decontamination of equipment is required before it is released from the project site. Physical removal of soil debris (e.g., scraping) will be the primary decontamination method. If additional equipment decontamination is deemed necessary (e.g., wet wiping with an amended water solution), then the project IH will determine the appropriate PPE to be worn for this task.

11.2.2 Personnel Decontamination

Unless upgrading is warranted, project activities will be conducted in Level D PPE. Engineering controls in conjunction with work controls and proper handling of ordnance explosive-contaminated soil and samples will serve as the primary means to eliminate the need for personnel decontamination.

Where personal decontamination is required, removal of the outer layer of protective clothing (e.g., gloves, coveralls, or booties) will serve as the primary decontamination method. The assigned project IH will determine additional personal decontamination techniques of explosive-contaminated soil on a case-by-case basis.

If radiological contamination requiring personal decontamination is encountered, then decontamination will be conducted under the direction of an RCT in accordance with MCP-148, “Personnel Decontamination.”

11.2.3 Decontamination in Medical Emergencies

Medical care for serious injury or illness will not be delayed for decontamination. In such cases, gross decontamination may be conducted by removing the injured person's outer protective clothing (if possible), and other contaminated areas may be contained with a bag or glove. If contaminated PPE cannot be removed without causing further injury (except for the respirator, which must be removed), the individual will be wrapped in plastic, blankets, or other available material to help prevent contaminating the inside of the ambulance, medical equipment, and medical personnel.

Injured workers will then be immediately evaluated by first-aid-trained project personnel (on a voluntary basis) at the project task site. The injured worker will be stabilized within the limits of training of the first-aid-trained individual, and the senior UXO supervisor will contact the WCC to summon emergency services (i.e., INEEL fire department and CFA medical services) to the project site.

The IH or RCT (depending on the type of contamination) will accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Contaminated PPE then will be removed at the CFA medical facility and will be handled carefully to prevent the spread of contamination (radiological).

11.3 Doffing Personal Protective Equipment and Performing Decontamination

As stated earlier, no personnel decontamination beyond doffing of PPE is anticipated for this project. Careful removal of the outer PPE will serve as the primary decontamination method.

The specific doffing sequence of modified Level D and C PPE, and associated decontamination procedures, will be based on the nature of contamination. A general approach for doffing modified Level D and C PPE is described below. However, no single doffing strategy works for all circumstances. Modifications to this approach are appropriate at the discretion of the project HSO in consultation with the project IH and RCT (if radiological hazards are present) or if site conditions change.

11.3.1 Modified Level D Personal Protective Equipment Doffing and Decontamination (if Required)

Where required to be worn, modified Level D protective clothing (e.g., Tyvek coveralls and booties) will be doffed after standard radiological removal techniques (rolling outside surface inward and down), and removal will constitute the initial decontamination step. Tape, gloves, booties, and any required dosimeter will be removed following the posted radiological doffing sequence if the protective clothing also is being worn as an anti-contamination layer. All PPE will be placed in the appropriately labeled waste container(s) for disposal. Doffing and any required decontamination will take place at the boundary between the site work area and radiological control area. If anti-contamination clothing is being doffed, then doffing will be followed by a personal contamination survey, as stated in the RWP.

11.3.2 Level C Personal Protective Equipment Doffing and Decontamination

Where respiratory protection is worn in conjunction with protective clothing (Level C PPE), the modified Level D sequence will be followed with one additional step. After protective clothing doffing, respirators will be removed and placed in a separate container. If in a radiologically controlled area, then the RCT will survey the face and sealing surfaces of the respirator or as part of the posted survey instructions by the respirator wearer. Doffing and any required decontamination will take place at the

designated work area or radiological control boundary. If exiting a radiological contamination area, personnel will conduct the proper personal survey, as stated in the RWP.

NOTE: Under some radiological conditions, two sets of anti-contamination clothing may be worn. When required, the posted instructions will address the proper doffing sequence for both sets.

11.4 Site Sanitation and Waste Minimization

Site personnel will use the toilet facilities at CFA or other INEEL area facility. Potable water and soap or disposable sanitizing towelettes will be made available in these areas for personnel to wash their hands and face upon exiting the work area.

Waste materials will not be allowed to accumulate at routine monitoring sites. Appropriately labeled containers for industrial waste and CERCLA waste (as required) will be maintained at the project site. Personnel should make every attempt to minimize waste through the judicious use of consumable materials. All site personnel are expected to make good housekeeping a priority at the job site.

12. RECORD-KEEPING REQUIREMENTS

12.1 Industrial Hygiene and Radiological Monitoring Records

When Industrial Hygiene support is required, the IH will record airborne monitoring and sampling data (both area and personal) collected for exposure assessments in the INEEL Hazards Assessment and Sampling System database. All monitoring and sampling equipment will be maintained and calibrated in accordance with INEEL procedures and the manufacturer's specifications. Industrial hygiene airborne monitoring and sampling exposure-assessment data are treated as limited access information and are maintained by the IH in accordance with INEEL safety and health manual procedures.

When required, the RCT will maintain a logbook of radiological monitoring, daily project operational activities, and instrument calibrations. Radiological monitoring records are maintained in accordance with *Manual 15B–Radiation Protection Procedures* (Radiation Protection Department 2004a).

Project personnel or their representatives have a right to receive the monitoring and sampling data (both area and personal) from both the IH and RCT. When they become available, results from monitoring data also will be communicated to all field personnel during daily POD meetings and formal prejob briefings, in accordance with MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback."

12.2 Field Logbook and Site Attendance Record

Logbooks will be maintained in accordance with MCP-1194, "Logbook Practices for ER and D&D&D Projects." The senior UXO supervisor will keep a record of daily site events in the field logbook and will maintain accurate records of all personnel (e.g., workers and nonworkers) who are onsite each day in a site attendance logbook. The site attendance logbook may be the same as the field logbook, depending on the project. Personnel will only be required to sign in and out of the attendance record once each day. The senior UXO supervisor is responsible for maintaining the site attendance record and for ensuring that all personnel on the project site sign in (if required). Logbooks must be submitted to Administrative Records and Document Control (ARDC) within 30 days after completion of field activities.

12.3 Administrative Record and Document Control Office

The ARDC will organize and maintain data and reports generated by BIC Project field activities. The ARDC maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of the management plans for the BIC Project, this HASP, PLN-694, the quality assurance project plan, and other documents pertaining to this work are maintained in the project file.

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