3. EXPOSURE MONITORING AND SAMPLING

A potential for exposure to radiological, chemical, and physical hazards exists during project tasks and may affect all personnel. Refinement of work control zones (Section 7), use of engineering and administrative controls, worker training, and wearing PPE provides the mitigation strategy for these hazards. Monitoring and sampling will be used during project tasks to (1) assess the effectiveness of these controls, (2) determine the type of PPE needed for individual tasks, and (3) determine the need for upgrading and downgrading of PPE as described in Section 5. Monitoring will be conducted in and around the active work location on a periodic basis and as determined based on site-specific conditions.

Table 3-1 lists the tasks and hazards that may be monitored, the frequency, and the monitoring instruments. Table 3-2 lists the action levels and associated responses for specific hazards.

3.1 Exposure Limits

Exposure limits identified in Table 3-1 serve as the initial action limits for specific project tasks. Project tasks will be continually assessed in accordance with PRD-25, "Activity Level Hazard Identification, Analysis, and Control," and evaluated by Radiological Control and Industrial Hygiene personnel to ensure engineering control effectiveness. Action limits should be adjusted as required based on changing site conditions, exposure mitigation practices, and PPE levels.

3.2 Environmental and Personnel Monitoring

Industrial Hygiene and RadCon personnel will conduct periodic monitoring with direct reading instrumentation, collect swipes, and conduct full- and partial-period air sampling, as deemed appropriate in accordance with the applicable MCPs, OSHA substance-specific standards, and as stated on the RWP. Instrumentation listed on Table 3-1 will be selected based on the site-specific conditions and contaminants associated with project tasks. The radiological control technician (RCT) and industrial hygienist (IH) 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.

3.2.1 Industrial Hygiene Area and Personal Monitoring and Instrument Calibration

The project industrial hygienist will conduct full- and partial-period sampling of airborne contaminants and monitoring of physical agents at a frequency deemed appropriate based on direct-reading instrument readings and changing site conditions. All air sampling will be conducted using applicable National Institute of Occupational Safety and Health (NIOSH), OSHA, or other validated method. Both personal and area sampling and monitoring may be performed.

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, 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 in conformance with the companywide safety and health manuals, *Manual 14A—Safety and Health, Occupational Safety and Fire Protection* and *Manual 14B—Safety and Health, Occupational Medical and Industrial Hygiene*. Direct reading instruments will be calibrated, at a minimum, before daily use and more frequently as determined by the project industrial hygienist. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded as stated in Section 12.

3.2.2 Area Radiological Monitoring and Instrument Calibration

Area radiological monitoring will be conducted during project tasks to ensure that personnel are given adequate protection from potential radiological exposure. Instruments and sampling methods listed in Table 3-1 may be used by the RCT 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* and *Manual 15C—Radiological Control Procedures.* The data obtained from monitoring will be used by RadCon personnel to evaluate the effectiveness of engineering controls, decontamination methods and procedures, and to alert personnel to potential radiation sources.

Radiological Control personnel will use radiation and contamination detectors and counters listed in Table 3-1, or equivalent instruments, to provide radiological information to personnel. Daily operational and source checks will be performed on all portable survey instruments to ensure they 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."

3.2.3 Personnel Radiological Exposure Monitoring

Personal radiological monitoring will be conducted to quantify radiation exposure and potential for uptakes as stated in the project or task-specific RWP. This may include the use of external dosimetry, surface monitoring, and internal dosimetry methods to ensure that engineering controls, administrative controls, and work practices are effectively mitigating radiological hazards.

3.2.3.1 External Dosimetry. Dosimetry requirements will be based on the radiation exposure potential during project tasks. When dosimetry is required, all personnel who enter the project area will be required to wear personal dosimetry devices, as specified by RadCon personnel and the RWP, and in accordance with the companywide Radiological Protection Manual 15A, *Radiation Control Procedures.*

When RWPs are required for project tasks, the Radiological Control and Information Management System (RCIMS) will be used to track external radiation exposures to personnel. Individuals are responsible for ensuring all required personal information is provided to RadCon personnel for entry into RCIMS and logging into RCIMS when electronic dosimeters are used.

3.2.3.2 Internal Monitoring. The purpose of internal dose monitoring is to demonstrate the effectiveness of contamination control practices and to document the nature and extent of any internal uptakes that may occur. Internal dose evaluation programs will be adequate to demonstrate compliance with 10 CFR 835, "Occupational Radiation Protection." The requirement for whole body counts and bioassays will be based on specific project tasks or activities and will be the determination of the radiological engineer. Bioassay requirements will be specified on the RWP, and project personnel will be responsible for submitting required bioassay samples upon request.

Table 3-1. Tasks and hazards that may be monitored, frequency, and monitoring instruments.

Tasks	Hazard(s) to be Monitored	Instrument Category to be Used	Instrument Category #	Monitoring Instruments Description[a,b]
Soil Drilling and Sampling	Ionizing radiation—(alpha, beta, gamma)	1	1	(Alpha) Count rate—Bicron/NE Electra (DP-6 or AP-5 probe) or equivalent. Stationary—Eberline RM-25 (HP-380AB or HP-380A probe) or equivalent.
	Radionuclide contamination—(alpha, beta, gamma)	2		
	Chemical constituents—organic vapors, lead, cadmium	3, 4		(Beta-gamma) Count rate—Bicron NE/Electra (DP-6, BP-17 probes) or equivalent. Stationary—Eberline RM-25 (HP-360AB probe) or equivalent.
	Respirable dust—silica (area and personal)	3, 5		
	Hazardous noise	6	2	Continuous air monitor (CAM)—ALPHA 6-A-1 (in-line and radial sample heads, pump, RS-485) or equivalent (as required). CAM (beta)—AMS-4 (in-line and radial head, pump RS-485) or equivalent (as required). Grab sampler—SAIC H-810 or equivalent.
	Ergonomics, repetitive motion, lifting	7		
	Heat and cold stress	8		
Heavy equipment operations	Respirable dust—silica (area and personal)	4, 5	6	American National Standards Institute (ANSI) Type S2A sound level meter or ANSI S1.25-1991 dosimeter (A-weighted scale for time-weighted average dosimetry, C-weighted for impact dominant sound environments).
	Hazardous noise	6		
	Ergonomics, repetitive motion, lifting	7		
Decontamination of equipment	Radionuclide contamination—(alpha, beta, gamma)	2		
	Chemical constituents—organic vapors, lead, cadmium	3, 4	7	Observation and ergonomic assessment of activities in accordance with MCP-2692, "Preventing Ergonomic and Back Disorders," and American Conference of Governmental Industrial Hygienists threshold limit value.
	Hazardous noise	6	8	Heat stress—wet-bulb globe temperature, body weight, fluid intake.
	Ergonomics, repetitive motion, lifting	7		
	Heat and cold stress	8		Cold stress—ambient air temperature, wind chill charts.

a. Monitoring and sampling will be conducted as deemed appropriate by project Industrial Hygiene and Radiological Control personnel based on specific tasks and site conditions.
b. Equivalent instrumentation other than those listed may be used.

Table 3-2. Action levels and associated responses for hazards.

Contaminant/Agent Monitored	Action Level		Response Taken If Action Levels Are Exceeded	
Nuisance particulates (not otherwise classified)	>10 mg/m^3 (inhalable fraction) >3 mg/m^3 (respirable fraction)		Move personnel to upwind position of source and close equipment cab windows and doors. Use wetting or misting methods to minimize dust and particulate matter. **IF** wetting or misting methods prove ineffective, **THEN** don respiratory protection[a] (as directed by industrial hygienist).	
Silica (respirable fraction)	Greater than or equal to the Occupational Safety and Health Administration permissible exposure limit of $\frac{10\ mg/m^3}{\%silica + 2}$ (29 CFR 1910.1000 [Z3])		Move personnel to upwind position of source. Use wetting or misting methods to minimize dust and particulate matter during mixing. **IF** wetting or misting methods prove ineffective, **THEN** don respiratory protection[a] (as directed by industrial hygienist).	
Hazardous noise levels	<85 decibel A-weighted (dBA) 8-hr time-weighted average (TWA), <83dBA 10-hr TWA		No action.	
	85 to 114 dBA		Hearing protection required to attenuate hazard to below 85 dBA 8-hr TWA or 83 dBA for 10-hr TWA (device noise reduction rating [NRR]).	
	(a) >115 dBA	(b) >140 dBA	(a) Isolate source, evaluate NRR for single device, double protection as needed.	(b) Control entry, isolate source, only approved double protection worn.
Radiation field	<5 mrem/h		No action, no posting required.	
	5 to 100 mrem/h @ 30 cm (10 CFR 835.603b)		Post as "Radiation Area"—Required items: Radiological Worker I or II training, radiological work permit (RWP), personal dosimetry.	
	>100 mrem to 500 Rad @ 100 cm (10 CFR 835.603b)		Post as "High Radiation Area"—Required items: RW II, RWP, alarming personal dosimetry, dose rate meter, and temporary shielding (as required).	

Table 3-2. (continued).

Contaminant/Agent Monitored	Action Level	Response Taken If Action Levels Are Exceeded
Radionuclide contamination	1 to 100 times Radiological Control Manual[b] Table 2-2 values (10 CFR 835.603d)	Post as "Contamination Area"—Required items: RW II training, personal dosimetry, RWP, don personal protective equipment (PPE), bioassay submittal (as required).
	>100 x Radiological Control Manual[b] Table 2-2 values (10 CFR 835.603d)	Post as "High Contamination Area"—Required items: RW II training, personal dosimetry, RWP (with prejob briefing), don PPE, bioassay submittal (as required).
Airborne radioactivity	Concentrations (μCi/cc) >30% of the derived air concentration value (10 CFR 835.603d)	Post as "Airborne Radioactivity Area"—Required items: RW II training, personal dosimetry, RWP (with prejob briefing), don PPE, bioassay submittal (as required).

a. Level C respiratory protection will consist of a full-face respirator equipped with a high-efficiency particulate air filter cartridge as prescribed by the project Industrial Hygiene and Radiological Control personnel (based on contaminant of concern). See Section 5 for additional Level C requirements.
b. *Manual 15 - Radiation Protection Procedures—INEEL Radiological Control* (PRD-183).

4. ACCIDENT AND EXPOSURE PREVENTION

Project activities will present numerous safety, physical, chemical, and radiological hazards to personnel conducting these tasks. It is critical that all personnel understand and follow the site-specific requirements of this HASP. Engineering controls, hazard isolation, specialized work practices, and the use of PPE will all be implemented to eliminate or mitigate all potential hazards and exposures where feasible. However, all personnel are responsible for the identification and control of hazards in their work area in accordance with Integrated Safety Management System (ISMS) principals and practices. **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 PRD-1004 or MCP-553, "Stop Work Authority," where it is perceived that imminent danger to personnel, equipment, or the environment exists.

This HASP is to 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 and GDE-6212, "Hazard Mitigation Guide for Integrated Work Control Process," mitigation guidance, JSAs, and RWPs will be incorporated into applicable sections of the HASP.

4.1 Voluntary Protection Program and Integrated Safety Management System

The INEEL safety processes embrace the Voluntary Protection Program (VPP) and Integrated Safety Management System (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 (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.

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. Visitors must check in with the shift supervisor at the 607 shift desk. Failure to follow these practices may result in permanent removal from the project and other disciplinary actions. Any problems must be immediately reported to the FTL and facility management (TAN shift supervisor). The project FTL and HSO will be responsible for ensuring the following safe-work practices are adhered to at the project site:

- Limit work area access to authorized personnel only, in accordance with PRD-1007, "Work Coordination and Hazard Control," and Section 7.

- All personnel have the authority to initiate STOP WORK actions in accordance with PRD-1004, or 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 work areas, except within designated areas.

- Be aware of and comply with all safety signs, tags, barriers, and color codes as identified in accordance with PRD-2022, "Safety Signs, Color Codes, and Barriers," or 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 may be present. Report all potentially dangerous situations to the FTL or HSO.

- Avoid direct contact with hazardous materials or waste. Personnel will not walk through spills or other areas of contamination and will avoid kneeling, leaning, or sitting on equipment or surfaces that may be contaminated.

- Be familiar with the physical characteristics of the project site, including, but not limited to:

  - Prevailing wind direction

  - Location of fellow personnel, equipment, and vehicles

  - Communications at the project site and with TAN

  - Area and the type of hazardous materials stored and waste disposed of

  - Major roads and means of access to and from the project site

  - Location of emergency equipment

  - Warning devices and alarms for area or facility

  - Capabilities and location of nearest emergency assistance.

- Report all broken skin or open wounds to the operations manager, FTL, or HSO. An OMP physician must examine all wounds to determine the nature and extent of the injury. If required to enter into a radiological contamination area, a RadCon supervisor will determine whether the wound can be bandaged adequately in accordance with Article 542 of the INEEL Radiological Control Manual (Manual 15A).

- Prevent releases of hazardous materials. If a spill occurs, personnel must try to isolate the source (if possible, and if this does not create a greater exposure potential) and then report it to the FTL, facility supervision, and the HSO. The Warning Communications Center (WCC) will be notified and additional actions will be taken, as described in Section 10. Appropriate spill response kits or other containment and absorbent materials will be maintained at the project site.

- Illumination levels during project tasks will be in accordance with 29 CFR 1910.120 (Table H-120.1, "Minimum Illumination Intensities in Foot-Candles").

- Ground-fault protection will be provided whenever electrical equipment is used outdoors.

- Keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments and use nonsparking, explosion-proof equipment, if advised to do so by safety professionals.

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

4.3 Radiological and Chemical Exposure Prevention

Exposure to potential chemical, radiological, and physical hazards will be mitigated by the use of engineering controls, administrative controls, or PPE to prevent exposures where possible, or minimize them where engineering controls are not feasible. All project personnel are responsible for understanding the hazard identification and mitigation measures necessary to prevent exposures.

4.3.1 Radiological Exposure Prevention – As Low as Reasonably Achievable Principles

Radiation exposure of project personnel will be controlled such that radiation exposures are well below regulatory limits and that there is no radiation exposure without commensurate benefit. **Unplanned and preventable exposures are considered unacceptable.** All project tasks will be evaluated with the goal of eliminating or minimizing exposures. All project personnel have the responsibility for following as-low-as reasonably achievable (ALARA) principles and practices. Personnel working at the site must strive to keep both external and internal radiation doses ALARA by adopting the following practices.

4.3.1.1 External Radiation Dose Reduction. Radiological work permits will be written as required for project tasks that will define hold points, required dosimetry, RCT coverage, radiological controlled areas, and radiological limiting conditions in accordance with MCP-7, "Radiological Work Permit." Radiological Control personnel will participate in the prejob briefing required by MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews," to ensure all personnel understand the dose rate limits and limiting conditions on the RWP. All personnel will be required to read and acknowledge the RWP requirements before being allowed to sign the RWP (or scan the RWP bar code) and obtain electronic dosimetry.

Basic protective measures used to reduce external doses include (1) minimizing time in radiation areas, (2) maximizing the distance from known sources of radiation, and (3) using shielding whenever possible. The following are methods to minimize external dose:

Methods for Minimizing Time

- Plan and discuss the tasks before entering a radiation area (including having all equipment and tools prepared)

- Perform as much work as possible outside radiation areas and take advantage of lower dose rate areas (as shown on the radiological survey maps)

- Take the most direct route to the tasks and work efficiently

- If problems occur in the radiation areas, hold technical discussions outside radiation areas, then return to the work area to complete the task

- If stay times are required, know your stay time and use appropriate signal and communication method to let others in the area know when the stay time is up

- Respond to electronic dosimetry alarms by notifying others in the area and the RCT, and exit the radiation area through the designated entry and exit point

- Know your current dose and your dose limit. DO NOT EXCEED YOUR DOSE LIMIT.

Methods for Maximizing Distance from Sources of Radiation

- Use remote operated equipment or controls where required

- Stay as far away from the source of radiation as possible (extremely important for point sources where, in general, if the distance between the source is doubled, the dose rate falls to one-fourth of the original dose rate)

- Become familiar with the radiological survey map for the area in which work will be performed as well as high and low dose-rate locations, and take advantage of low dose-rate areas.

Proper Use of Shielding

- Know what shielding is required and how it is to be used for each radiation source

- Take advantage of the equipment and enclosures for shielding yourself from radiation sources

- Wear safety glasses to protect eyes from beta radiation.

4.3.1.2 Internal Radiation Dose Reduction. An internal radiation dose potential exists. An internal dose is a result of radioactive material being taken into the body. Radioactive material can enter the body through inhalation, ingestion, absorption through wounds, or injection from a puncture wound. Reducing the potential for radioactive material to enter the body is critical to avoid an internal dose. The following are methods to minimize internal radiation dose hazard:

- Know the potential and known contamination sources and locations, and minimize or avoid activities in those areas

- Wear protective clothing and respiratory protection as identified on the RWP, perform all respirator leak checks, and inspect all PPE before entering contaminated areas or areas with airborne radioactivity

- Use a high-efficiency particulate air (HEPA) filter exhaust system

- When inside contaminated areas, do not touch your face (adjust glasses or PPE) or other exposed skin

- When exiting contaminated areas, follow all posted instructions and remove PPE in the order prescribed (if questions arise, consult RadCon personnel)

- Conduct whole body personnel survey when exiting the contaminated area, then proceed directly to the personnel contamination monitor

- Report all wounds or cuts (including scratches and scrapes) before entering radiologically contaminated areas

- Wash hands and face before eating, drinking, smoking, or engaging in other activities that may provide a pathway for contaminants.

Monitoring for radiation and contamination during project tasks will be conducted in accordance with the RWP, PRD-183, *Manual 15A - Radiation Protection—INEEL Radiological Controls*, *Manual 15B - Radiation Protection Procedures*, and *Manual 15C - Radiological Control Procedures*, and as deemed appropriate by RadCon personnel.

4.3.2 Chemical and Physical Hazard Exposure Avoidance

Note: Identification and control of exposures to carcinogens will be conducted in accordance with MCP-2703, "Carcinogens."

Threshold limit values (TLVs) or other occupation exposure limits have been established for numerous chemicals and physical agents (e.g., noise, heat, or cold stress) that may be encountered. These exposure limits provide guidelines in evaluating airborne, skin, and physical agent exposures. The TLVs represent levels and conditions under which it is believed that nearly all workers may be exposed day after day without adverse health effects. The TLV time-weighted average (TLV-TWA) is a time-weighted average concentration for a conventional 8-hr workday and a 40-hr workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects. Action limits (instantaneous concentrations for short time periods) have been established (Section 3) to further reduce the likelihood of exceeding TLVs.

Controls will be employed to eliminate or mitigate chemical and physical hazards wherever feasible. The hierarchy of controls in order are (1) engineering controls, (2) administrative controls, and (3) PPE. In addition to these controls, use of technical procedures and work orders, hold points, training, and monitoring of hazards will be used as appropriate to reduce exposure potential. Some methods of exposure avoidance include:

- Wearing all required PPE, inspecting all pieces before donning, and taping all seams

- Changing PPE if it becomes damaged or shows signs of degrading

- Minimizing time in direct contact with hazardous material or waste

- Doff PPE following standard practices (i.e., rolling outer surfaces in and down) and follow doffing sequence

- Wash hands and face before eating, drinking, smoking, or engaging in other activities that may provide a pathway for contaminants.

4.4 Buddy System

The two-person, or "buddy" system, will be used during project tasks. The buddy system is most often used during project activities requiring the use of protective clothing and respiratory protection where heat stress and other hazards may impede a person's ability to self-rescue. 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.

The buddy system will be administered by the FTL in conjunction with the HSO.

5. PERSONAL PROTECTIVE EQUIPMENT

This section provides guidance for the selection and use of PPE to be worn for project tasks and contingencies for upgrading and downgrading PPE. Types of PPE are generally divided into two broad categories: (1) respiratory protective equipment and (2) PPE. Both of these categories are incorporated into the standard two levels of protection (Levels C and D).

The purpose of personal protective clothing and equipment is to shield or isolate individuals from the chemical, physical, radiological, and safety hazards that may be encountered during project tasks when engineering and other controls are not feasible or cannot provide adequate protection. It is important to realize that no one PPE ensemble can protect against all hazards under all conditions and that proper work practices and adequate training will serve to augment PPE to provide the greatest level of protection to workers.

The Idaho Completion Project (ICP) PPE policy requires that field workers wear, as a minimum, sturdy leather boots that rise above the ankles, safety glass with side shields, and hard hats. The HSO or Safety Professional will determine where and when this requirement will be invoked for each project.

The type of PPE will be selected, issued, used, and maintained in accordance with PRD-2001 or 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, chemicals, or waste
- Toxicity of hazardous materials, chemicals, or waste that may be encountered
- Duration and intensity of exposure
- Compatibility of chemical(s) with PPE materials and potential for degradation or breakthrough
- Environmental conditions (e.g., humidity, heat, cold, rain)
- The hazard analysis (Section 2) evaluation of this HASP.

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

The PPE requirement for specific project tasks is identified in Table 5-1. This list may be augmented by an SWP or RWP. Potential exposures and hazards will be monitored (as discussed in Section 3) during the course of the project to evaluate changing conditions and to determine PPE level adequacy and modifications.

Table 5-1. Task-based personal protective equipment requirements and modifications.

Task	Initial Level of Personal Protective Equipment	Upgrade Contingency	Downgrade Contingency	Upgrade or Downgrade Criteria	Personal Protective Equipment Modifications and Comments
Soil Sampling	D+	C	D	Upgrade to Level C if airborne concentrations exceed action limits.	Level C respiratory protection defined by the IH, based on airborne contaminant.
				Downgrade to Level D if contact with surveys show no detectable contamination on surfaces.	Leather gloves for all material handling tasks.
Heavy equipment operations	D	D+	N/A	Upgrade to Level D+ if contact with waste material cannot be avoided.	D+ protective clothing consists of Tyvek hooded coveralls (or equivalent). Leather gloves.
Equipment decontamination	C	C+	D+	Upgrade to Level C+ if splashing during decontamination of lead, cadmium, radiologically contaminated equipment cannot be avoided.	Level C respiratory protection defined by the IH, based on airborne contaminant. Level C protective clothing consists of Tyvek (or equivalent) hooded coverall.
				Downgrade to Level D+ for decontamination of small items using spray and wipe decontamination methods.	Level C+ protective clothing consists of Saranex (or equivalent coated hooded coverall). Leather gloves over nitrile for equipment and material handling before or after decontamination tasks. Double pair nitrile gloves during decontamination tasks.

5.1 Respiratory Protection

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective will be to prevent atmospheric contamination. This will be accomplished as far as feasible by accepted engineering control measures (e.g., enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators will be selected and used.

Required task-based respiratory protection and protective clothing are listed on Table 5-1. Respirators may be required for specific project tasks. 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. Requirements for respirator use, emergency use, storage, cleaning, and maintenance, as stated in the MCP-2726 and PRD-2109, "Respiratory Protection," will be followed.

5.2 Personal Protective Equipment Levels

Table 5-2 lists PPE requirements for the two levels of PPE that may be worn during the course of the project. Applicable PPE levels will be required for conducting project tasks. Modifications to these levels will be made under the direction of the HSO in consultation with the project Industrial Hygiene and RadCon personnel, as appropriate. Such modifications are routinely employed during HAZWOPER site activities to maximize efficiency and to meet site-specific needs without compromising personnel safety and health.

5.2.1 Level D Personal Protective Equipment

Level D PPE will only be selected for protective clothing and not on a site with respiratory or skin absorption hazards requiring whole-body protection. Level D PPE provides no protection against airborne chemical hazards, but rather is used for protection against surface contamination and physical hazards. Level D PPE will only be allowed in areas that have been characterized as having limited contamination hazards.

5.2.2 Level C Personal Protective Equipment

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

5.3 Personal Protective Clothing Upgrading and Downgrading

The project HSO, in consultation with the project IH (and RadCon personnel), 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. Action levels listed in Table 3-2 serve as the initial basis for making such decisions. Additional reasons for upgrading or downgrading are listed in the following subsections and will be reflected in the RWP.

Table 5-2. Levels and options of personal protective equipment.

Personal Protective Equipment Level	Personal Protective Equipment Required	Optional Personal Protective Equipment or Modifications
D	Coveralls or standard work clothes (coverall material type based on IH determination) Hard hat (unless working indoors with no overhead or falling debris hazards) meeting ANSI Z89.1 requirements Eye protection (safety glasses meeting ANSI Z87.1 requirements 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 requirements, or sturdy leather footwear above the ankle for construction tasks.	Chemical or radiological protective clothing (Tyvek or Saranex) by IH or RCT Chemically resistant hand and foot protection (e.g., inner and outer gloves and boot liners) Radiological modesty garments under outer protective clothing (as required by RWP) Any specialized protective equipment (e.g., hearing protection, cryogenic gloves, face shields, welding goggles, and aprons).
C	Level D ensemble with the following respiratory and whole-body protection upgrades:[a] • Full-facepiece air purifying respirator equipped with a National Institute of Occupational Safety and Health-approved high-efficiency particulate air (HEPA) filter or chemical combination cartridge (IH to specify cartridge type) **OR** • An air hood operating at a minimum pressure of 6 cfm, or a full-facepiece supplied air respirator with a 10-minute escape bottle, a self-contained breathing apparatus (SCBA), or an escape air-purifying combination HEPA or chemical cartridge (supplied air respirator hose length no more manufacturer's specification and under no circumstances greater than 91 m [300 ft]) **AND** • Standard Tyvek (or equivalent) coverall **OR** • Chemical-resistant coveralls (e.g., Tyvek QC, Tychem 7500, or Saranex-23-P) (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) Radiological modesty garments under outer protective clothing (as required by RWP) Any specialized protective equipment (e.g., hearing protection, welding lens, and aprons).

a. Upgrades are determined by the industrial hygienist in conjunction with other environment, safety, and health professionals.

Note: Personnel must inspect all PPE before donning and before entry into any work zone. Items found to be defective or become unserviceable during use will be doffed and disposed of in accordance with posted procedures and placed into the appropriate waste stream. The PPE inspection guidance is provided in Table 5-3.

5.3.1 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 site hazards
- Temporary loss or failure of any engineering controls
- Contaminants that present difficulty in monitoring or detecting
- Known or suspected presence of skin absorption hazards
- Identified source or potential source of respiratory hazard(s) not anticipated
- Change in the task procedure that may result in an increased contact with contaminants or meeting any of the criteria listed above.

5.3.2 Downgrading Criteria

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

- Elimination of hazard or completion of task(s) requiring specific PPE
- Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazard
- Sampling information or monitoring data that show the contaminant levels to be stable and lower than established action limits
- Elimination of potential skin absorption or contact hazards.

5.4 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected before use and when in use within project work zones. Self-inspection and the use of the buddy system, once PPE is donned, will serve as the principle forms 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 zone exit point to doff and replace the unserviceable PPE. If PPE fails, personnel should follow their training. (In addition, all PPE that becomes grossly contaminated or presents a potential source for the spread of such contamination will be required to be decontaminated or replaced). Table 5-3 provides an inspection checklist for common PPE items. 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. Consult the project IH, safety professional, and RCT about PPE inspection criteria.

Table 5-3. Inspection checklist for personal protection equipment.

Personal Protection Equipment Item	Inspection
Respirators (full-facepiece air-purifying respirators)	**Before use:** Check condition of the facepiece, head straps, valves, fittings, and all connections for tightness. Check cartridge to ensure proper type or combination is being used for atmospheric hazards to be encountered, and inspect threads and O-rings for pliability, deterioration, and distortion.
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 they are still intact.
Gloves	**Before use:** Pressurize rubber gloves to check for pinholes (blow in the glove, then roll until air is trapped and inspect). No air should escape. **Leather gloves:** Inspect seams and glove surface for tears and splitting and verify no permeation has taken place.

6. PERSONNEL TRAINING

All INEEL personnel will receive training, as specified in 29 CFR 1910.120 or 29 CFR 1926.65 and INEEL companywide manuals as applicable. Table 6-1 summarizes the project-specific training requirements for personnel-based access requirements, responsibilities at the project site, potential hazards, and training level requirements.

Modifications (e.g., additions to or elimination of) to training requirements listed in Table 6-1 may be necessary based on changing field conditions. Any changes to the requirements listed in Table 6-1 must be approved by the HSO, with concurrence from the FTL, project manager, RCT, and IH, as applicable. These changes should be based on site-specific conditions and a change to the HASP will be processed, as defined by instructions from Form 412.11, "Document Management Control Systems (DMCS) Document Action Request (DAR)."

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 site-specific briefing, are required to wear PPE, and must provide objective evidence of having completed INEEL computer-based PPE training (00TRN288, "Personal Protective Equipment") or equivalent, in accordance with 29 CFR 1910.132, "Personal Protective Equipment."

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 document action requests, (2) applicable job safety analyses (JSAs) and SWPs (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 Post-Job Reviews").

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. 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."

A trained HAZWOPER 8-hour supervisor (FTL or other person who has been trained by the HAZWOPER supervisor) will monitor the performance of each newly 24-hour or 40-hour trained worker to meet the 1 or 3 days of supervised field experience, respectively, in accordance with 29 CFR 1910.120(e). Following the supervised field experience period, the supervisor will complete Form 361.47, "HAZWOPER Supervised Field Experience Verification," or equivalent, to document the supervised field experience.

Table 6-1. Required project-specific training.

Required Training	Field Team Leader, Health and Safety Officer, and Samplers	Other Field Team Members	Access into the (Designated or Controlled Work Area, Construction Area or Contamination Reduction Zone)	Access to Project Areas Outside (Designated or Controlled Work Area, Construction Area or Contamination Reduction Zone)
40-hour hazardous waste operations (HAZWOPER)[a] – operations	Yes	b	b	
24-hour HAZWOPER[a] – operations		b	b	
Project-specific health and safety plan training[c]	Yes	Yes	Yes	
Project-site orientation briefing[d]				Yes
Fire extinguisher training (or equivalent)	e	e		
Cardiopulmonary resuscitation, medic first aid	e	e		
Respirator training (contingency only)	f	f		
Lead and cadmium awareness training	**Yes**	g	g	

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

a. Includes 8-hour hazardous waste operations (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.

b. 40-hour or 24-hour HAZWOPER training requirement will be determined by the HSO based on the nature of the project tasks and potential for exposure to contaminants or safety hazards.

c. Includes project-specific hazards communications (29 CFR 1910.120), site-access and security, decontamination and emergency response actions, as required by 29 CFR 1910.120(e).

d. Orientation includes briefing of site hazards, designated work areas, emergency response actions, and PPE requirements. Personnel receiving project-site orientation briefing only are limited to the areas outside designated work areas and must be escorted by a project supervisor or designee who is fully trained on the requirements of the health and safety plan.

e. At least one trained person onsite when field team is working, and the health and safety officer, will determine the appropriate number of personnel requiring training.

f. Only required if entering area requiring respiratory protection (e.g., action levels exceeded or the industrial hygienist sampling shows respirators required).

g. Only if entering areas where initial exposure determination indicates exposure above the action limit is possible.

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) site (documented), or they are upgrading from 24- to 40-hour HAZWOPER training. A copy of the training record must be kept at the project site as evidence of training or be available electronically.

Note 2: Completed training project forms (Form 361.47, or equivalent) should be submitted to the Idaho Completion Project (ICP) program training coordinator for inclusion in the Training Records and Information Network system within 5 working days of completion.

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

A daily planning meeting, or equivalent meeting, will be conducted by the FTL or designee. During this meeting, daily tasks are to be outlined; hazards identified; hazard controls, mitigation, and work zones established; PPE requirements discussed; and feedback from personnel 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, a planning meeting 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 planning meeting will be conducted as an informal meeting and the only required record will be to document the completion of the planning meeting in the (FTL or construction engineer or subcontractor technical representative) logbook.

Safety and health topic-specific training or safety meetings may also be conducted during the course of the project to reinforce key safety topics. They may be conducted by project safety and the industrial hygienist or any field team member and should be performed in conjunction with the planning meeting. 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 site during all activities to prevent unauthorized personnel from entering the work area. Entry into and exit out of these areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-2022, "Safety Signs, Color Codes, and Barriers," or PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color codes."

The HSO and Safety Professional should be consulted regarding equipment layout at the project site (in conjunction with the Subcontractor Superintendent for subcontractor-owned equipment) to minimize personnel hazards from equipment. The focus should be on equipment with stored energy (electrical, pressurized systems, elevated materials/equipment, chemical), moving and rotating parts (equipment that is guarded and that has open rotating parts such as a drill rig), and other equipment with the potential to result in personnel injuries from being struck-by, caught-between, or entangled in such equipment. The layout at the project site of equipment should reflect the nature of the hazard presented and should be mitigated through the use of engineering controls (barriers, guards, 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 to include maintaining working and walking surfaces to minimize tripping hazards, stacking or storing in a centralized location materials and equipment in a centralized location when not in use, and regular cleanup of debris and trash that may accumulate at the project site.

Both radiological and nonradiological hazards (including industrial safety hazards) will be evaluated when establishing the initial work zone size, configuration, and location. Figure 7-1 illustrates an example of work zones that may be established at the project task site, based on HSO/RCT/IH recommendations. Common barriers may be used to delineate both radiological and nonradiological work-zone postings, depending on the nature and extent of contamination. If common barriers are used, they will be delineated and posted in accordance with both sets of requirements (29 CFR 1910.120 and 10 CFR 835), using appropriately colored rope and postings. These zones may change in size and location as project tasks evolve, based on project monitoring data, and as wind direction changes. Additionally, entrance and egress points will change based on these same factors. Work zones may include:

- Support Zone (SZ) (controlled area)
- Contamination Reduction Zone (CRZ), Radiological Buffer Area (RBA), including a contamination reduction corridor (CRC) if radiological hazards are present
- Exclusion Zone (EZ), Radiation Area (RA), High Radiation Area (HRA), Contamination Area (CA), High Contamination Area (HCA), or Very High Radiation Area (VHRA).

Visitors may be admitted into work areas provided they (1) are on official business; (2) have received site-specific training or orientation by the FTL or designee; (3) have met all the site-specific training requirements for the area they have a demonstrated need to access (including PPE training), as listed on Table 6-1; and (4) wear all required PPE.

Note: Visitors may not be allowed into controlled work areas during certain tasks in order to minimize risks to workers and visitors. The determination as to any visitor's need for access into the controlled work area will be made by the FTL in consultation with the HSO.

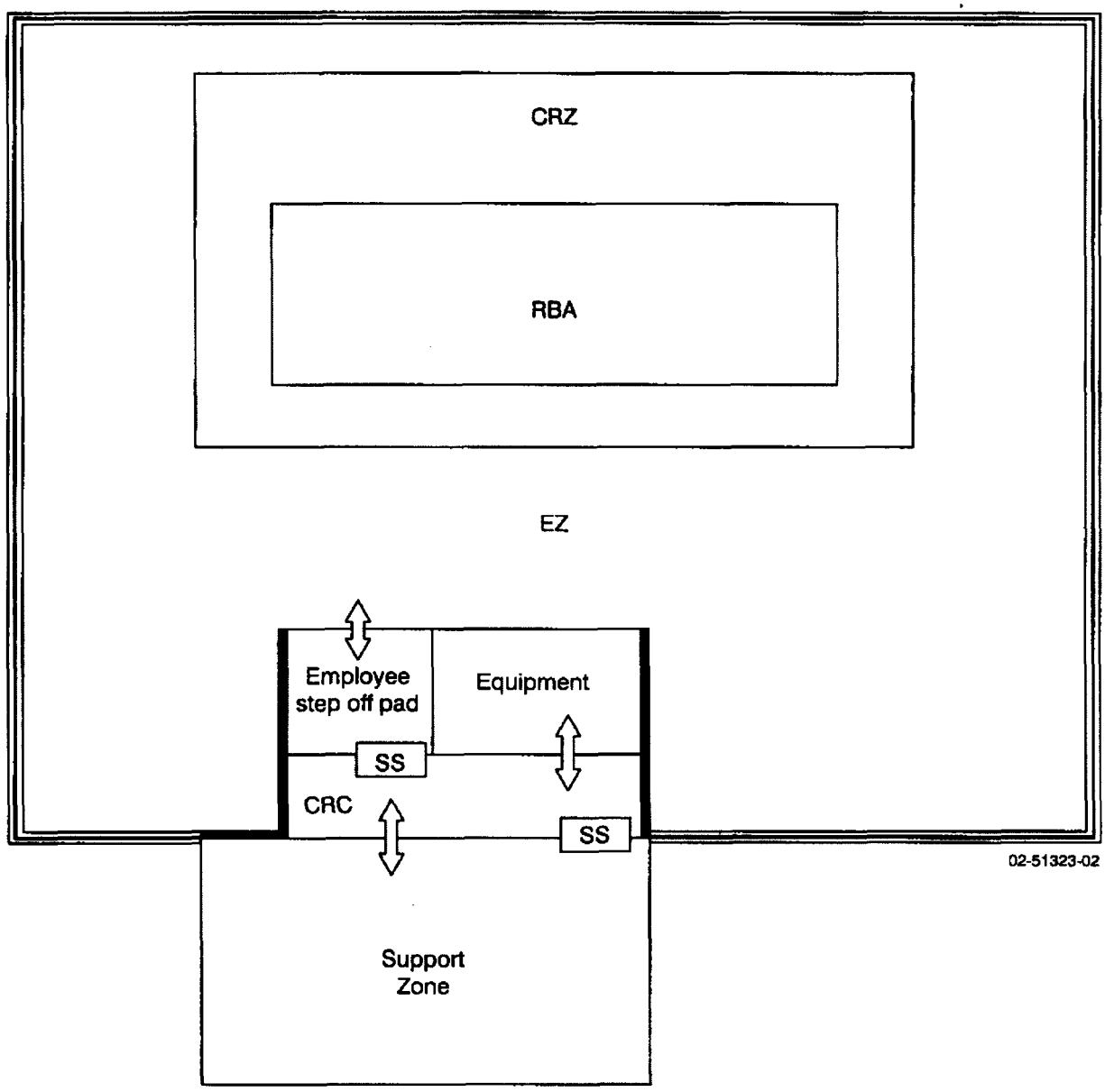

Figure 7-1. Work zone example.

7.1 Exclusion Zone

The exclusion zone (EZ) will be large enough to encompass the primary task area for sampling and to allow equipment and personnel to move about freely and conduct necessary tasks. The minimum number of personnel required to safely perform project tasks will be allowed into the EZ. If the EZ will be relocated to another site or reconfigured, it will be delineated in a configuration large enough to prevent nonfield team personnel in the support zone (SZ) from being exposed to potential safety and health hazards. The EZ shape and size will be based on the tasks being conducted, existing structures and facilities, and potential for impact to adjacent areas from project tasks or contaminants.

The EZ is a controlled access zone at all times. An entry and exit point will be established at the periphery of the EZ and the contamination reduction corridor (CRC) to regulate the flow of personnel and equipment. The EZ boundary will be delineated with rope or printed hazard ribbon and posted with signs in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes," or PRD-2022, "Safety Signs, Color Codes, and Barriers."

Factors that will be considered when establishing the EZ boundary include (1) tasks being conducted, (2) air monitoring data, (3) radiological contamination data, (4) radiation fields, (5) equipment in use, (6) the physical area necessary to conduct site operations, and (7) the potential for contaminants to be blown from the area. The boundary may be expanded or contracted as these factors change or additional monitoring information becomes available. All personnel who enter the EZ will wear the appropriate level of PPE for the hazards present and have required training as listed in Sections 5 and 6 of this HASP, respectively.

7.2 Contamination Reduction Zone and Corridor

The contamination reduction zone (CRZ) and the contamination reduction corridor (CRC) are transition areas surrounding the EZ and are located between the EZ and SZ. The CRC may not be formally delineated, but will be designated by the travel path from the established CRZ-controlled entry and exit point and the EZ entry and exit point. The CRZ and CRC will serve to buffer the SZ from potentially contaminated EZ areas. The CRZ and CRC may serve as staging areas for equipment and temporary rest areas for personnel.

7.3 Support Zone

The support zone (SZ) will be considered a "clean" area. The location of the SZ will be in a prevailing upwind direction from the EZ (where possible) and readily accessible from the nearest road. The SZ is a designated area or building outside the CRZ and does not have to be delineated. Support trailers, vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment may be located in the SZ. Visitors who do not have appropriate training to enter other project areas will be restricted to this zone.

7.4 Radiological Control and Release of Materials

Potential radiologically contaminated items or equipment will not be released until required radiological surveys have been completed (e.g., hand-held instruments and swipes) in accordance with MCP-139, "Radiological Surveys," MCP-425, "Radiological Release Surveys, and the Disposition of Contaminated Materials," as stated in the RWP, and as directed by RadCon personnel.

7.5 Site Security

All project site areas will be secured and controlled during normal work hours as described in the previous sections. These include the TSF-09/18 (V-Tanks), and TSF-21 at WAG 1, OU 1-10. During nonworking hours, the general project sites located inside INEEL facilities are controlled by the facility fence and normal security access requirements. However, additional project site security and control will be required to prevent unauthorized personnel from entering the project area and being exposed to potential safety or health hazards. This will be accomplished by delineating project areas with rope boundaries and posting where hazards are left unmitigated (e.g., open trenches, exposed contaminated soils, or equipment left onsite). Signage will be left in place during off-hours and weekends to prevent personnel from inadvertently entering the area.

The FTL has the primary responsibility for ensuring that the project area is secured. The HSO and RadCon (where required) will ensure that all health and safety and radiological postings of the area are intact when leaving the site and will be responsible for maintaining them for the duration of the project. Project personnel are trained about site access and control requirements during project-specific HASP training and will not cross roped areas without the proper training and authorization, regardless of whether a sign is in place or not.

Note: Signs are routinely lost because of high winds and will be replaced as soon as possible upon discovery.

7.6 Wash Facilities and Designated Eating Areas

Ingestion of hazardous substances is possible when workers do not practice good personal hygiene habits. 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. For project personnel, and/or subcontractor personnel, designated eating area and wash facilities will be provided.

7.7 Designated Smoking Area

Smoking areas will be designated and personnel will comply with all INEEL smoking policies including disposing of smoking materials in the proper receptacle. Smoking will not be permitted outside facilities without establishing a designated smoking area. The project safety professional in consultation with the designated fire protection engineer will be the single point of contact for establishing any smoking area outside facilities; however, such areas may not be permitted at certain times of the year because of high or extreme fire danger.

8. OCCUPATIONAL MEDICAL SURVEILLANCE

Task-site personnel will participate in the INEEL occupational medical surveillance program (or equivalent subcontractor program), as required by DOE Order 440.1, "Worker Protection Management for DOE Federal and Contractor Employees," and 29 CFR 1910.120 or 1926.65. Medical surveillance examinations will be provided before assignment, annually, and after termination of HAZWOPER duties or employment. This includes:

- Personnel who are, or may be, exposed to hazardous substances at or above the OSHA permissible exposure limit (PEL), or published exposure limits, without regard to respirator use for 30 or more days per year

- All employees who are injured, become ill, or develop signs or symptoms because of possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation

- All employees who wear a respirator for 30 days or more a year or as required by "Respiratory Protection (29 CFR 1910.134)."

Personnel who wear a respirator in performance of their job, or who are required to take respirator training to perform their duties under this plan, must participate in the medical evaluation program for respirator use at least annually, as required by MCP-2726 or PRD-2109, "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 physician) conducting medical surveillance for employees participating in this project. Exposure monitoring results and hazard information furnished to the OMP physician will be supplemented or updated annually (as stated in Section 12) as long as the employee is required to maintain a hazardous waste and material employee medical clearance. The OMP physician will then evaluate the physical ability of an employee to perform the work assigned.

A documented medical clearance (e.g., a physician's written opinion) will be provided to the employee and line management stating whether the employee 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 use areas, and confined space areas, as applicable. The physician may impose restrictions on the employee by limiting the amount and type of work performed.

Personnel are responsible for communicating any work or medical restrictions to their supervisor so modified work assignments can be made 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 employees responsibility to inform the supervisor of any work or medical restrictions.

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 or 29 CFR 1926.65. This 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 or 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 physician on request.

8.2 Injuries on the Site

It is the policy of the INEEL that an INEEL OMP physician examines all injured personnel for the following reasons:

- An employee is injured on the job
- An employee is experiencing signs and symptoms consistent with exposure to a hazardous material
- An employee is believed to have been exposed to toxic substances or physical or radiological agents 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 may cause further injury or harm. Most likely, the person making this decision will only be trained to the medic first/CPR level and should contact Central Facilities Area medical facility (777 or 526-1515), for further guidance if there is any question as to the extent of injury or potential to cause 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 employee will be transported to the nearest INEEL medical facility for evaluation and treatment, as necessary. The HSO and FTL are responsible for obtaining as much of the following information as is available to accompany the individual to the medical facility:

- Name, job title, work (site) location, and supervisor's name and phone number
- Substance, physical or radiological agent exposed to (known or suspected), and material safety data sheet, if available
- Nature of the incident and injury or exposure and associated signs or symptoms of exposure
- First aid or other measures taken
- 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 compliance with 29 CFR 1910.120 or 29 CFR 1926.65.

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 will be transported by INEEL ambulance to have an injury stabilized before transport to the subcontractor's treating physician or off-Site medical facility.

The TAN shift supervisor and project manager will be contacted if any injury or illness occurs at a project site. As soon as possible after an injured employee has been transported to the INEEL medical facility, the FTL or designee will make notifications as indicated in Section 10.

8.3 Substance-Specific Medical Surveillance

No contaminants (listed in 29 CFR 1910, Subpart Z) with substance-specific standards have been identified at the project site. If new contaminants of concern are identified during the course of project tasks, exposures will be evaluated and quantified to determine if 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.

If new contaminants of concern are identified during the course of project tasks, then exposures will be evaluated and quantified to determine if a substance-specific standard applies. If regulatory mandated, substance-specific standard action levels are triggered, then affected personnel will be enrolled in applicable substance-specific medical surveillance programs.

9. PROJECT ORGANIZATION AND RESPONSIBILITIES

The organizational structure for this project 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, and the project within the program structure are shown on the organizational chart (Figure 9-1). The organizational chart is not all-inclusive, but shows the structure for key resources assigned to complete project tasks.

9.1 Key Personnel Responsibilities

The following sections outline responsibilities of key site personnel.

9.1.1 TAN Closure Completion Project Director

The TAN Closure Completion Project Director has ultimate responsibility for the technical quality of all projects, the maintenance of a safe environment, and the safety and health of all personnel during field activities performed by or for the ICP program. The project director provides technical coordination and interfaces with DOE-ID. The project director ensures the following:

- Project/program activities are conducted in accordance with the Occupational Safety and Health Administration (OSHA), DOE, EPA, and IDEQ requirements and agreements
- Program budgets and schedules are approved and monitored to be within budgetary guidelines
- Personnel, equipment, subcontractors, and services are available
- Direction is provided for tasks development, findings evaluation, conclusions and recommendations development, and reports production.

The TAN site Project Director is responsible for several functions and processes in the TAN area, including the following:

- Overseeing all work processes and work packages performed at TAN
- Establishing and executing a monthly, weekly, and daily operating plan for TAN
- Executing the Environmental, Safety, Health, and Quality Assurance program for TAN
- Executing the Integrated Safety Management System for TAN
- Executing the Enhanced Work Planning for TAN
- Executing the Voluntary Protection Program at TAN
- Ensuring environmental compliance within TAN
- Executing the portion of the voluntary compliance order that pertains to TAN
    - Correcting the root cause functions of accident investigations at TAN
    - Correcting the root cause functions of the voluntary compliance order for TAN.

9.1.2 Project Manager

The WAG 1 project manager (PM) or designee (e.g., OU 1-10 RD/RA PM) will ensure that all project activities are in compliance with the following guidelines and regulations:

- INEEL MCPs and program requirements directives (PRDs)
- The Quality Assurance Project Plan (QAPjP) (DOE-ID 2002), and the project HASP
- All applicable OSHA, EPA, DOE, DOT, and State of Idaho requirements.

The PM is responsible for the overall work scope, schedule, and budget, including such tasks as the following:

- Developing resource-loaded, time-phased control account plans based on the project's technical requirements, budgets, schedules, and project tasks
- Coordinating all document preparation, field, laboratory, and modeling activities
- Implementing the project requirements and ensuring that work is performed as planned.

The PM will ensure that employee job function evaluations (INEEL Form 340.02) are completed for all project employees, reviewed by the project industrial hygienist (IH) for validation, and submitted to the Occupational Medical Program (OMP) for determination of necessary medical evaluations.

Other functions and responsibilities of the PM include:

- Developing the documentation required to support the project
- Ensuring the technical review and acceptance of all project documentation
- Developing the site-specific plans required by the ICP program, such as work plans, environmental, safety, and health (ES&H) plans, and sampling and analysis plans (SAPs)
- Ensuring that project activities and deliverables meet schedule and scope requirements, as described in the FFA/CO, Attachment A, "Action Plan for Implementation of the Federal Facility Agreement and Consent Order" (DOE-ID 1991), and applicable guidance
- Supporting the CERCLA and National Environmental Policy Act (NEPA) public review and comment processes by identifying their requirements and scheduling and organizing required review and comment activities
- Identifying the subproject technology needs
- Coordinating and interfacing with the units within the program support organization on issues relating to quality assurance, ES&H, and NEPA support for the project
- Coordinating site-specific data collection, review for technical adequacy, and data input to an approved database

- Coordinating and interfacing with subcontractors to ensure milestones are met, adequate management support is in place, technical scope is planned and executed appropriately, and project costs are kept within budget.

9.1.3 Health and Safety Officer

The health and safety officer (HSO) assigned to the task site serves as the primary contact for all health and safety issues. The HSO advises the FTL on all aspects of health and safety, and is authorized to stop work at the site if any operation threatens worker or public health and/or safety. As appropriate, the HSO is authorized to verify compliance to the HASP to conduct conformance inspections and self-assessments, require and monitor corrective actions, and monitor decontamination procedures. The HSO may be assigned other specific responsibilities, as stated in other sections of the project HASP, as long as they do not interfere with the primary responsibilities.

Other ES&H professionals at the task site, such as the safety engineer (SE), IH, RCT, environmental coordinator, and facility representative, support the HSO as necessary.

Personnel assigned as the HSO, or alternate HSO, must be qualified (per the OSHA definition) to recognize and evaluate hazards, and will be given the authority to take or direct actions to ensure that workers are protected. While the HSO may also be the IH, SE, or, in some cases, the FTL (depending on the hazards, complexity, and size of the activity involved, and required concurrence from the ICP safety and health compliance officer), other task-site responsibilities of the HSO must not conflict (philosophically or in terms of significant added volume of work) with the role of the HSO at the task site.

If it is necessary for the HSO to leave the site, an alternate individual will be appointed by the HSO to fulfill this role, and the identity of the acting HSO will be recorded in the FTL logbook and communicated to task-site personnel.

Note: The HSO will ensure the appropriate Environmental, Safety, Health, and Quality Assurance personnel participate in the development and verification of the hazards screening profile checklist in accordance with relevant INEEL work control processes.

9.1.4 Industrial Hygienist

The industrial hygienist (IH) is the primary source of information regarding nonradiological hazardous and toxic agents at the work site. The IH will be present at the task site during any work operations involving either existing or anticipated chemical hazards to operations personnel.

The IH assesses the potential for worker exposure to hazardous agents in accordance with INEEL procedures and the project HASP, assesses and recommends appropriate hazard controls for protection of work site personnel, reviews the effectiveness of monitoring and PPE required in the project HASP, and recommends changes as appropriate.

Following an evacuation, the IH will assist in determining whether conditions at the task site are safe for reentry. Personnel showing health effects resulting from possible exposure to hazardous agents will be referred to the OMP by the IH, their supervisor, or the HSO. The IH may have other duties at the task site, as specified in other sections of the project HASP, or company procedures and manuals. During emergencies involving hazardous material, members of the Emergency Response Organization will perform IH measurements.

9.1.5 Safety Engineer

The assigned safety engineer (SE) reviews work packages, observes work site activity, assesses compliance with the project HASP, signs safe work permits, advises the FTL on required safety equipment, answers questions on safety issues and concerns, and recommends solutions to safety issues and concerns that arise at the task site. The SE may conduct periodic inspections, and have other duties at the task site as specified in other sections of the project HASP, or in PRDs and/or MCPs. Copies of inspections will be kept in the project field file.

9.1.6 Fire Protection Engineer

The assigned fire protection engineer reviews the work packages, conducts preoperational and operational fire hazard assessments, and is responsible for providing technical guidance to site personnel regarding all fire protection issues.

9.1.7 Radiological Control Technician

The radiological control technician (RCT) is the primary source of information and guidance on radiological hazards that may be encountered during drilling and sampling tasks. The RCT will be present at the task site during any work operations when a radiological hazard to operations personnel may exist or is anticipated. In addition to other possible duties at the site specified in other sections of the project HASP, the PRDs, and/or MCPs, RCT responsibilities include radiological surveying of the work site, equipment, and samples; providing guidance for radiological decontamination of equipment and personnel; and accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radiological contamination occurs.

The RCT must notify the HSO and FTL of any radiological occurrence that must be reported as directed by the INEEL *Radiological Control Manual* (PRD-183).

9.1.8 TAN Facility Manager

The TAN facility manager is responsible for maintaining the assigned facility and must be cognizant of work being conducted in the facility. The TAN facility manager is responsible for the safety of personnel and the safe completion of all project activities conducted within the area in accordance with the area director concept. The TAN facility manager is ultimately responsible for all operations that take place in the facility and to ensure that operations are conducted within the safety and authorization basis documents.

The facility manager and TAN site project director will be kept informed of all activities performed in the area. The facility manager and FTL will agree on a schedule for reporting work progress and plans for work. The facility manager may also serve as an advisor to task-site personnel with regard to TAN operations.

9.1.9 Quality Assurance Engineer

The quality assurance (QA) engineer provides guidance on task-site quality issues, when requested. The QA engineer observes task site activities, verifies that these operations comply with quality requirements pertaining to these activities, identifies activities that do not comply or have the potential for not complying with quality requirements, and suggests corrective actions.

9.1.10 Field Team Leader

The field team leader (FTL) has ultimate responsibility for the safe and successful completion of the sampling project, and all health and safety issues at the work site must be brought to the FTL's attention. In addition to managing field operations, executing the field sampling plan (FSP), enforcing site control, documenting work site activities, and conducting daily safety briefings, the FTL's responsibilities include, but are not limited to, the following:

- Performing the technical and operational requirements of the sampling activities
- Conducting field analysis and decontamination activities
- Complying with equipment removal procedures
- Packaging and shipping samples
- Determining, in conjunction with the site IH and RCT, the level of PPE necessary for the task being performed
- Ensuring compliance with field documentation, sampling methods, and chain-of-custody requirements
- Ensuring the safety of personnel conducting the activities associated with the HASP
- Ensuring the "fit for duty" medical evaluation forms are completed for all project employees, reviewed by the project IH for validation, and then incorporated into the project field file.

The FTL may be a member of the sampling team, and FTL responsibilities may be transferred to a designated representative who satisfies all FTL training requirements.

9.1.11 Field Team Members

All field team members, including field team, sampling team, and subcontractor personnel, will understand and comply with the requirements of the project HASP. The FTL or HSO will conduct a planning meeting briefing at the start of each shift. During the planning meeting briefing, all daily tasks, associated hazards, hazard mitigation (engineering and administrative controls, required PPE, work control documents), and emergency conditions and actions will be discussed. The project HSO, IH, and RCT personnel will provide input to clarify task health and safety requirements, as deemed appropriate. All personnel are encouraged to ask questions regarding site tasks and to provide suggestions for performing required tasks in a more safe and effective manner based on the lesson learned from the previous day's activities.

Once at the site, personnel are responsible for identifying any potentially unsafe situations or conditions to the FTL or HSO for corrective action. If it is perceived that an unsafe condition poses an imminent danger, site personnel are authorized to stop work immediately, then notify the FTL or HSO of the unsafe condition.

9.1.12 Sampling Team Leader

The sampling team leader (STL) reports to the FTL and has ultimate responsibility for the safe and successful completion of assigned project tasks, including:

- Overseeing the sampling team

- Ensuring that the samples are collected from appropriate locations
- Ensuring that proper sampling methods are employed, chain-of-custody procedures are followed, and shipping requirements are met.

If the STL leaves the task site, an alternate individual will be appointed to act in this capacity. An acting STL on the task site must meet all the same training requirements as the FTL, as outlined in the project HASP. The identity of the acting STL shall be conveyed to task-site personnel, recorded in the daily force report, and communicated to the FTL and TAN site Area Director, or designee, when appropriate. The STL may also be the FTL for the sampling event.

9.1.13 Sampling Team

The sampling team will consist of a minimum of two members (including the STL) who will perform the onsite tasks necessary to collect the samples. The buddy system will be implemented for all tasks; no team member will enter the contamination zone alone. The members of the sampling team will be led by a FTL, who may also serve as the project STL. The IH and RCT will support the sampling team, as warranted, based on sight-specific hazards and task evolutions.

9.1.14 Nonfield Team Members/Visitors

All persons on the work site who are not part of the field team (e.g., surveyor, equipment operator, or other craft personnel not assigned to the project) are considered nonfield team members or visitors for the purposes of this project. A person will be considered "onsite" when they are present in or beyond the designated support zone. Under 29 CFR 1910.120, and 29 CFR 1926.65, nonfield team members are considered occasional site workers and must comply with the following:

- Check in with the TAN shift supervisor
- Receive any additional site-specific training identified in the HASP prior to entering beyond the support zone of the project site
- Meet all required training based on the tasks taking place, as identified in the HASP
- Meet minimum training requirements for such workers as described in the OSHA standard
- Meet the same training requirements as the workers if the nonworkers' tasks require entry into the work control zone.

Training must be documented and a copy of the documentation must be incorporated into the project field file. A site supervisor (e.g., HSO or FTL) will supervise all nonfield team personnel who have not completed their three days of supervised field experience in accordance with the hazardous waste operations standard.

Note: Visitors may not be allowed beyond the support zone during certain project site tasks (drilling) to minimize safety and health hazards. The determination as to any visitor's "need" for access beyond the support zone at the project site will be made by the HSO in consultation with TAN RadCon personnel (as appropriate).

9.1.15 Waste Generator Services

Waste Generator Services will perform waste disposition for this project.

9.2 Points of Contact

Table 9-1 lists the key points of contact for the TAN, WAG 1, OU 1-10 field activities conducted at the Soil Contamination Area South of the Turntable (TSF-06, Area B) and the PM-2A Tanks (TSF-26). The points of contact listed in the table are those expected to be contacted as a part of sampling operations. An exhaustive contact list of all personnel with responsibilities listed in Section 9.1 is not provided.

Table 9-1. Points of contact.

Name	Title	Telephone Number
Al Jantz	WAG 1 Project Manager	(208) 526-8517
Dave Eaton	WAG 1 Environmental Compliance	(208) 526-7002
Gary McDannel	WAG 1 Project Engineer	(208) 526-5076
Jim Jessmore	OU 1-10 RD/RA Project Manager	(208) 526-7558
John Harris	Waste Generator Services	(208) 526-3461
Robert Miklos	TAN Clean and Close Project Director	(208) 526-4072
TBD	Health and Safety Officer	TBD
TBD	Field Team Leader	TBD
TBD	Industrial Hygienist	TBD
B.P. Shagula	Safety Engineer	(208) 526-0585
TBD	Fire Protection Engineer	TBD
TBD	Radiological Control Technician	TBD
A.E. Millhouse	TAN Facility Manager	(208) 526-6932
James K. Rider	Quality Assurance Engineer	(208) 526-2534
Donna Kirchner	Sample Management Office Contact	(208) 526-9873

TBD = to be determined

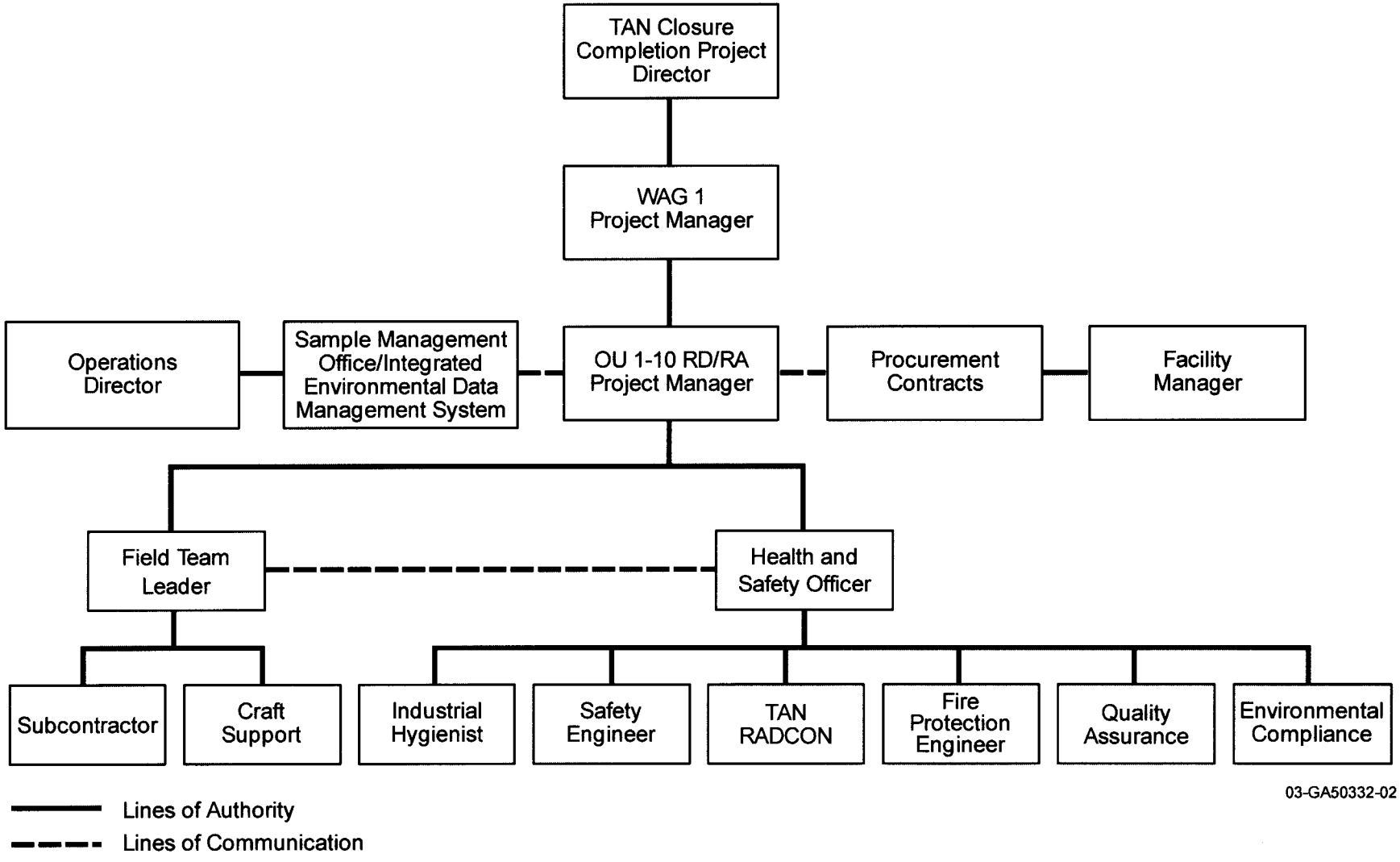

Figure 9-1. Organization chart.

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 the project site, on a tenant facility or collocated facility, or a Sitewide emergency. This section provides details of the INEEL Emergency Response Organization (ERO) and "INEEL Emergency Plan RCRA Contingency Plan" (PLN-114) information. Plan-114 describes the overall process developed to respond to and mitigate consequences of emergencies that might arise at the INEEL.

Plan-114 may be activated in response to events occurring at the project site, at the INEEL, or at the discretion of the emergency coordinator or emergency action manager. Once the INEEL plan is activated, project personnel will follow the direction and guidance communicated by the emergency coordinator.

Note: The OSHA HAZWOPER definition of an emergency is not defined the same as classified by DOE Orders 151.1A, "Comprehensive Emergency Management System," and 232.1, "Occurrence Reporting and Processing of Operations Information." For this reason, the term "event" will be used in this section when referring to project HAZWOPER emergencies.

10.1 Pre-Emergency Planning

The "INEEL Emergency Plan RCRA Contingency Plan" (PLN-114) provides the basis for preplanning all INEEL emergency events. This base plan is supplemented with INEEL facility-specific addendums. This preplanning makes it possible for the project to anticipate and appropriately respond to abnormal events that can affect project activity. Preplanning also ensures that the project emergency response program is integrated with that of the INEEL. Specific procedures for addressing emergency events and actions to be taken are further described in the facility-specific emergency implementing procedures. Finally, the HASP addresses project-specific hazards, potential emergency events, and the actions to take following such events.

10.2 Emergency Preparation and Recognition

The sections for hazards identification and mitigation and accident prevention provided the strategy that will be followed at the project site to prevent accidents. Similarly, emergency preparation and recognition also will require project personnel to be constantly alert for potentially hazardous situations and signs and symptoms of chemical exposure or releases. All field personnel should be familiar with the techniques for hazard recognition and the assigned action levels and associated actions to be taken as identified in Section 3.

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

Preparation and training on emergencies will include proper site access and egress procedures in response to project events and INEEL emergencies as part of the project-specific HASP training and facility access training where applicable. Visitors also will receive this training on a graded approach based on their site access requirements. Visitor training will include alarm identification, location and use of communication equipment, location of site emergency equipment, and evacuation. Emergency phone numbers and evacuation route maps will be located in the project trailer.

On-scene response to, and mitigation of, site emergencies could require the response from both project personnel and INEEL fire department personnel. Emergencies could include the following scenarios:

- Accidents resulting in injury
- Fires
- Spills of hazardous or radiological materials
- Tornadoes, earthquakes, or 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 Alerting, Responses, and Sheltering

10.3.1 Alarms

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. To signal site personnel of a project-initiated emergency event, a separate set of emergency signals has been established based on horn blasts (e.g., vehicle or air horn).

Depending on the field location (within or outside a facility), facility alarms may not be able to be heard at the project site. If the 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. The project signals will then be used to alert personnel of the emergency actions. Radio contact is required when working in the field.

10.3.1.1 Take Cover—Continuous Siren. Radiation or hazardous material releases, adverse weather conditions, or other event or emergency conditions may 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 situation and 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.

STEADY = STAY

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 the project trailer or vehicle (if outside the facility). Eating, drinking, and smoking are not permitted during take-cover conditions.

10.3.1.2 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.

ALTERNATE = EVACUATE

For total area evacuations, the facility command post is activated and all personnel will gather at the primary facility evacuation assembly area or the location designated by the EC or FTL if outside a facility. The FTL or trained alternate will then complete the personnel accountability using the attendance log. In this situation, the project area warden will report the result of the accountability process to the facility emergency coordinator.

10.3.1.3 Local Area Evacuation—Vehicle Horn Blast. A local area evacuation is the complete withdrawal of personnel from the project site but it does not require the complete evacuation of the entire facility or INEEL area. A single long horn blast (e.g., vehicle) will serve as the project's primary emergency evacuation signal (as listed on Table 10-1). 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 in a safe condition (as appropriate) and then proceed along the specified evacuation route to the assembly area designated for local area evacuations or as directed by the FTL. Eating, drinking, and smoking are not permitted during emergency evacuations.

Table 10-1. 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 designated assembly area as specified by the field team leader (FTL).
	Two short blasts—Nonemergency evacuation of immediate work area. Proceed to designated assembly area as specified by the FTL.
	Three long blasts or verbally communicated—All clear, return to project site.

10.4 Personnel Roles, Lines of Authority, and Training

10.4.1 The Idaho National Engineering and Environmental Laboratory Emergency Response Organization

The INEEL ERO structures are based on the incident command system and are described in PLN-114 and facility-specific addendums to that plan.

10.4.2 Role of Project Personnel in Emergencies

Depending on the event, a graded response and subsequent notifications will take place. FTL and project personnel responsibilities are described below. Personnel will respond to emergencies only within the limits of their training and designated by their position. All personnel are trained to the facility-specific emergency actions as part of the access training or will be escorted by someone who has been trained. Emergency response actions also will be covered as part of the HASP briefing as stated in Table 6-1.

10.4.2.1 Field Team Leader. The FTL (or designated alternate) is responsible for initiating all requests for emergency services (e.g., fire and medical) and for notifying the TAN shift supervisor of abnormal (or potential emergency) events that may occur during the project. The FTL may also serve as the area warden (or designate that responsibility to another person who has been trained as area warden) and conduct personnel accountability. Personnel accountability will then be reported to the shift supervisor. Additionally, the FTL will control the scene until a higher-tiered incident command system authority arrives at the scene to take control. When relinquishing this role the FTL (or designated alternate) will provide all information about the nature of the event, potential hazards, and other information requested.

10.4.2.2 Project Personnel. Every person at the project site has a role to play during a project event or INEEL emergency. Each employee must be constantly aware of potential problems or unexpected hazardous situations and immediately report these situations to the FTL. All personnel are expected to watch out for their fellow workers, to report their concerns to the FTL, and to take emergency actions as described in this section. Roles and responsibilities are further detailed in Table 10-2.

Table 10-2. Responsibilities during an emergency.

Responsible Person	Action Assigned
Field team leader (or designee)	Signal evacuation
	Report spill to shift supervisor and take mitigative actions[a]
	Contact shift supervisor or Warning Communications Center (if the shift supervisor cannot be contacted)
Field team leader (or trained designee)	Serve as area warden, conduct accountability, and report to shift supervisor
Health and safety officer and medic and first-aid trained personnel	Administer first aid to victims (voluntary basis only).

a. The environmental affairs spill response categorization and notification team will be contacted by the shift supervisor or emergency coordinator.

10.4.2.3 Personnel Accountability and Area Warden. Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and local evacuation alarms. In all cases, the FTL (or trained designee) will account for the people present on the project site. The FTL (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 communicated to the FTL for reporting to the shift supervisor or emergency coordinator (if the command post has been formed).

10.4.2.4 Spills. If the material spilled is known, and is small enough to be safely contained at the task site, task-site personnel will handle spill control using spill supplies at the site and immediately report the incident to the shift supervisor or WCC if the shift supervisor cannot be contacted. Reporting requirements will be determined by the facility emergency coordinator in accordance with MCP-190, "Event Investigation and Occurrence Reporting." If any release of a hazardous material occurs, task site personnel will comply with the following immediate spill response actions.

10.4.2.4.1 Untrained Initial Responder—The requirements for the untrained initial responder (or if the material characteristics are unknown) are listed below:

- Place equipment in a safe configuration

- Evacuate and isolate the immediate area
- Notify and then seek help from and warn others in the area
- Notify the FTL.

10.4.2.5 Trained Responder. The requirements for the trained responder where material characteristics are known and no additional PPE is required are listed below:

- Place all equipment in a secure configuration
- Seek help from and warn others in the area
- 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)
- Provide pertinent information to the FTL
- Secure any release paths if safe to do so.

10.5 Medical Emergencies and Decontamination

Medical emergencies and responses to injuries or suspected exposures will be handled as stated in Section 8.2. Decontamination of personnel and equipment is described in Section 11.2.

10.6 Emergency Communications

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

10.6.1 Notifications

During emergency situations, the facility shift supervisor will be notified of any project emergency event. The shift supervisor will then make the required ERO notification. The following information should be communicated, as available, to the shift supervisor:

Note: If the shift supervisor cannot be contacted then the WCC will be notified of the event and the information listed below communicated. The WCC also must be told that notification to the facility shift supervisor and emergency coordinator has not been made.

- The caller's name, title (e.g., FTL 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)
- Additional information as requested.

10.7 Emergency Facilities and Equipment

Emergency response equipment maintained at the project site includes the items listed in Table 10-3. The TAN facility-specific addendum to PLN-114 lists emergency equipment available at the facility. This includes the command post, self-contained breathing apparatus, dosimeters, air samplers, decontamination and first aid equipment, and an emergency response trailer. 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 provide immediate hazardous material spills and medical services. Additionally, the Central Facilities Area-1612 medical facilities are manned by medical personnel to evaluate and stabilize injured personnel or those experiencing signs and symptoms of exposure. The FTL will check all emergency equipment prior to work, and will record the information in his logbook.

Table 10-3. 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[a]
First aid kit	Project vehicle or near designated work area (DWA) or controlled work area (CWA)	Health and safety officer (HSO)	Monthly: check seal only unless broken
Eyewash bottles[b] Eyewash station[b]	In or near DWA or CWA	HSO	Monthly
Hazardous materials spill kit	Project vehicle	HSO	Daily verification
Extra personal protective equipment	Project vehicle or support trailer	HSO	Daily verification
Communication equipment (operational)	Onsite	Field team leader	Daily radio check
Fire extinguishers[c]	In or near DWA or CWA	HSO	Monthly

a. This is verification that equipment is present at the project location before starting tasks and no inspection tag is required.
b. An eyewash bottle will be used to provide an immediate eye flush if required. The location of the eyewash station will be identified by the HSO during the prejob briefing.
c. A minimum of one 10A/60BC extinguisher is required. If it is discharged, it will be returned for servicing and recharging.

10.8 Evacuation Assembly Areas and Test Area North Medical Facility

The TAN Facility maintains primary and secondary evacuation routes and assembly areas. These routes may be used in response to a total facility area evacuation as directed by the emergency coordinator. Copies of the evacuation assembly areas (Figure 10-1) will be available at the project site.

Note: If the project is conducted outside of a facility, then the INEEL evacuation routes listed in PLN-114 will be used.

10.9 Reentry, Recovery, and Site Control

All reentry and recovery activities will follow general site security and control requirements identified in Section 7 unless conducted as part of an emergency response action. All entries to the project site performed in support of emergency actions will be controlled by the on-scene commander.

10.9.1 Reentry

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

- Performing personnel search and rescues
- Responding to medical first aid needs
- Performing safe shutdown actions
- Performing mitigating actions
- Evaluating and preparing damage reports
- Performing 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.

10.9.2 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of assessing post-event and post-emergency conditions and developing a plan for returning to pre-event and pre-emergency conditions, when possible, and following the plan to completion. The emergency coordinator and emergency action manager are responsible for determining when an emergency situation is sufficiently stable to terminate the emergency and enter the recovery phase. The project manager, with concurrence from the site area director (SAD), will appoint the recovery manager.

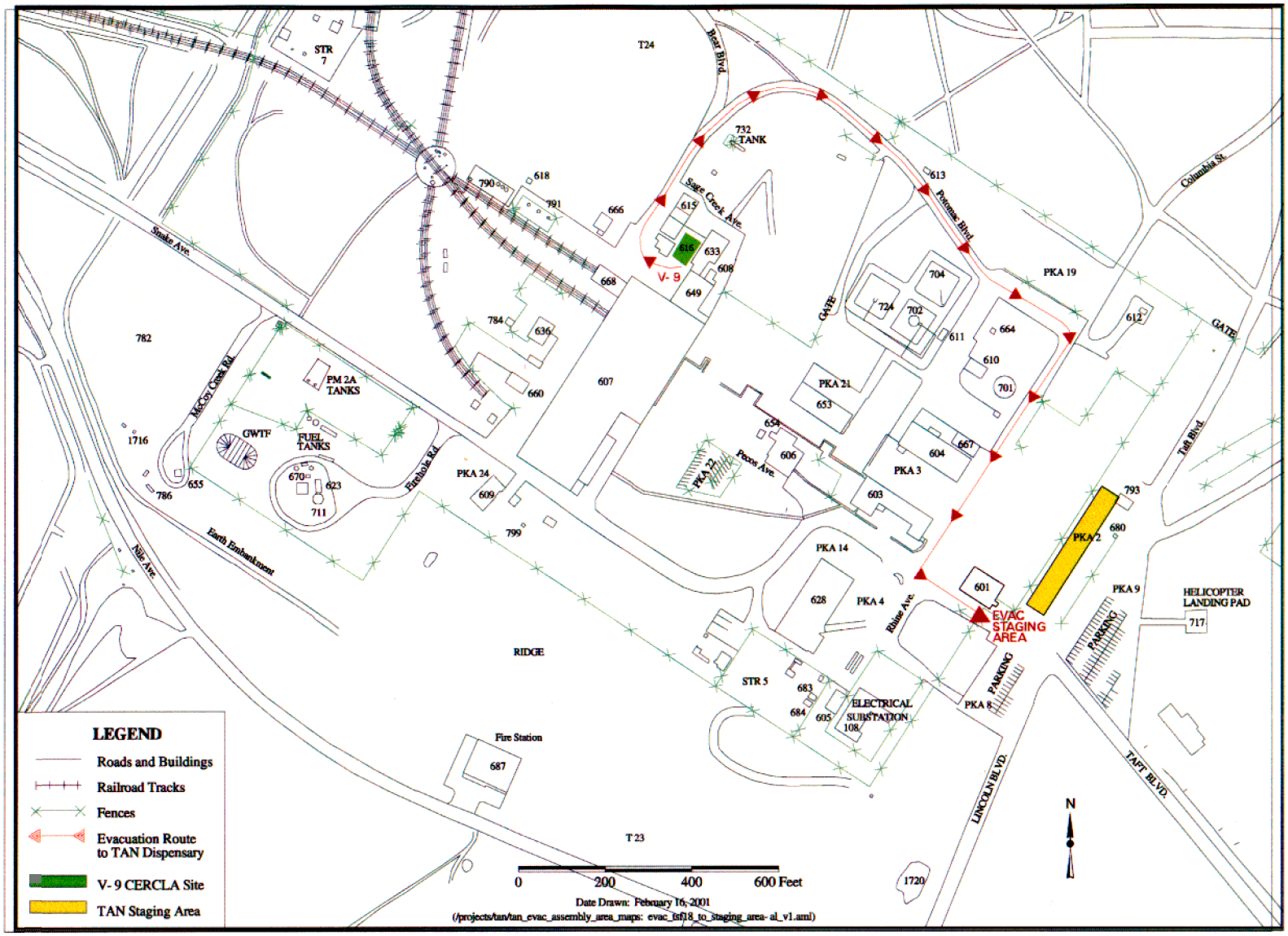

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Figure 10-1. Primary evacuation routes for the TSF-09/18 (V-Tanks) and TSF-21 remediation project.

10.10 Critique of Response and Followup

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

10.11 Telephone and Radio Contact Reference List

Table 10-4 lists the points of contact for the project. A copy of this list will be kept in the FTL logbook. Because personnel listed may change frequently, working copies of this list will be generated as required to note new positions and changes of personnel assigned. This HASP should not be revised with a document action request to note these changes.

Table 10-4. Project emergency contact list.

Name	Title	Telephone Number
Al Jantz	WAG 1 Project Manager	(208) 526-8517
Dave Eaton	WAG 1 Environmental Compliance	(208) 526-7002
Gary McDannel	WAG 1 Project Engineer	(208) 526-5076
Jim Jessmore	OU 1-10 RD/RA Project Manager	(208) 526-7558
John Harris	Waste Generator Services	(208) 526-3461
Robert Miklos	TAN Clean and Close Project Director	(208) 526-4072
TBD	Health and Safety Officer	(208) 526-6856
TBD	Field Team Leader	(208) 526-6199
TBD	Industrial Hygienist	TBD
B. P. Shagula	Safety Engineer	(208) 526-6648
TBD	Fire Protection Engineer	TBD
TBD	Radiological Control Technician	TBD
A. E. Millhouse	TAN Facility Manager	(208) 526-1102
James K. Rider	Quality Assurance Engineer	(208) 526-2534
Donna Kirchner	Sample Management Office Contact	(208) 526-9873

TBD = to be determined

11. DECONTAMINATION PROCEDURES

Every effort will be made to prevent contamination of personnel and equipment through the use of engineering controls, isolation of source materials, contaminant monitoring, personnel contamination control training, and by following material handling requirements and procedures for contaminated or potentially contaminated materials. If contact with potentially contaminated surfaces cannot be avoided, then additional engineering controls, in combination with PPE upgrades, may be necessary to control the contact hazard. 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 contaminated surfaces if such surfaces are encountered or may be contacted during project tasks. The following contamination control and prevention measures will be employed if contamination is encountered or anticipated:

- Identify potential sources of contamination and design containment, isolation, and engineering controls to eliminate or mitigate any potential for contact or release of contaminants
- Limit the number of personnel, equipment, and materials that enter the contaminated area
- Implement immediate decontamination procedures to prevent the spread of contamination (if contamination is found on the outer surfaces of equipment)
- Use only the established control entry and exit point from the contaminated area to minimize the potential for cross-contamination and expedite contamination control surveys
- Wear disposable outer garments and use disposable equipment (where possible)
- Use hold points defined in procedures and work orders to monitor for contamination where anticipated.

11.2 Equipment and Personnel Decontamination

Personnel and equipment decontamination procedures are necessary to control contamination and to protect personnel should contamination be encountered. Both chemical and radioactive material contamination will be decontaminated from surfaces of a contaminated area at the exit and other designated work area boundaries.

If radioactive material decontamination operations are required for equipment or areas, they will be performed in accordance with Chapter 4 of the INEEL Radiological Control Manual. Nonradioactive material decontamination will be evaluated by the HSO and project industrial hygienist on a case-by-case basis to determine the most appropriate level of PPE to be worn. An RWP will be generated if radioactive material contamination is encountered. Specific equipment and personnel decontamination methods are provided in the following subsections.

11.2.1 Equipment Decontamination

Decontamination of sampling equipment will be conducted in accordance with GDE-140, "Decontamination of Sampling Equipment," and TPR-6575, "Decontamination of Sampling Equipment in the Field." If contact with potentially contaminated surfaces cannot be avoided, then additional engineering controls in combination with PPE upgrades may be necessary to control the contact hazard. Equipment will be decontaminated based on the source of contamination.

If radioactive material decontamination operations are required for equipment or areas, they will be performed in accordance with Chapter 4 of INEEL Radiological Control Manual. Nonradioactive material decontamination will be evaluated on a case-by-case basis by the HSO and project industrial hygienist to determine the most appropriate PPE (Level C protective clothing will initially be selected if airborne contaminants may be generated until site monitoring can demonstrate downgrading is warranted). This will be documented in the RWP.

A decontamination pad may be established if nonradioactive material decontamination is required before equipment can be released. If it is deemed necessary and appropriate by the project industrial hygienist, then a wet wiping with an amended water solution (e.g., amended with a nonphosphate detergent such as Alconox) or a potential steam cleaning of this equipment may be conducted before it is allowed to leave the decontamination area. A drainage system that allows for a single collection point will be established if steam cleaning is performed. Decontamination wastewater will be collected using a submergible pump and containerized and characterized in accordance with companywide *Manual 17—Waste Management*, and relevant MCPs.

11.2.2 Personnel Decontamination

Project activities will be conducted in Level D PPE unless upgrading is warranted. Engineering controls in conjunction with work controls and proper handling of samples will serve as the primary means to eliminate the need for personnel decontamination. If modified Level D protective clothing is required, all items will be inspected following the list in Section 5.

Project tasks initially will be conducted in Level D or modified Level D PPE unless upgrading is warranted. Engineering controls, in conjunction with project contamination prevention and control practices and proper protective clothing donning and doffing procedures, will serve as the primary means to eliminate the need for personnel decontamination. Before donning PPE, all items will be inspected, following the list in Table 5-3. Following the donning of protective clothing, the FTL, HSO, or RCT will check to verify the donning technique has been performed properly.

The modified Level D PPE selection, as identified in the RWP will provide for the layered barriers required to minimize external surface contact with potentially contaminated surfaces. The options for the outermost protective clothing layer (e.g., Tyvek QC or Saranex-23C) will depend on the likelihood for deposition of contaminants and the specific tasks.

11.2.3 Decontamination in Medical Emergencies

If a person is injured or becomes ill, that person will be immediately evaluated by first-aid trained personnel (on a voluntary basis) at the project task site. If the injury or illness is serious, then the FTL will contact the TAN shift supervisor or WCC (if the shift supervisor cannot be reached) to summon emergency services (i.e., fire department and medical services) to the project site.

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.

The industrial hygienist or the 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 medical facility and carefully handled to prevent the spread of contamination. The INEEL Radiation Protection Manual, Chapter 5, and MCP-148, "Personnel Decontamination," contains information on proper handling of radioactive material contaminated wounds.

11.3 Doffing Personal Protective Equipment and 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 or C PPE, and associated decontamination procedures, will be based on the nature of the contamination. A general approach for doffing modified Level D or C PPE is described below. However, no one doffing strategy works for all circumstances. Modifications to this approach are appropriate if site conditions change or at the discretion of the project HSO in consultation with the project industrial hygienist and RCT.

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

Modified Level D protective clothing (e.g., disposable coveralls), if required to be worn, will be doffed following standard radiological removal techniques and will constitute the initial decontamination step. All PPE will be placed in the appropriately labeled containers.

11.3.2 Level C Personal Protective Equipment Doffing and Decontamination (if required)

If respiratory protection is worn in conjunction with protective clothing (e.g., Level C PPE), then the modified Level D sequence will be followed with one additional step. That additional step is to remove the respirator and place it in a separate container from the discarded protective clothing. Depending on the type of contamination encountered, this step will be followed by a radiological survey or industrial hygienist evaluation.

11.4 Personnel Radiological Contamination Monitoring

An automated whole-body radiological survey may be required before exiting the project site, as determined appropriate by RadCon personnel or as stated in the RWP. If required, this survey will be conducted using an existing personnel contamination monitor or other available hand-held instrument as directed by RadCon personnel.

11.4.1 Site Sanitation and Waste Minimization

Site personnel will use the portable toilet facilities provided in the TAN 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, as stated in the *Waste Management Plan for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites* (INEEL 2003). 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. RECORDKEEPING REQUIREMENTS

12.1 Industrial Hygiene and Radiological Monitoring Records

When industrial hygiene support is required, the industrial hygienist 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 manufacturer specifications. Industrial hygiene airborne monitoring and sampling exposure assessment data are treated as limited access information and maintained by the industrial hygienist in accordance with INEEL companywide Safety and Health Manual procedures.

The RCT maintains a logbook of radiological monitoring, daily project operational activities, and instrument calibrations. Radiological monitoring records are maintained in accordance with companywide *Manual 15B—Radiation Protection Procedures.*

Project personnel or their representatives have a right to the monitoring and sampling data (both area and personal) from both the industrial hygienist and the RCT. Results from monitoring data also will be communicated to all field personnel during daily planning meetings and formal prejob briefings, in accordance with MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews."

12.2 Field Team Leader and Sampling Logbooks

Logbooks will be maintained in accordance with MCP-1194, "Logbook Practices for ER and D&D&D Projects." The FTL will keep a record of daily site events in the FTL logbook and will maintain accurate records in a site attendance logbook of all personnel (e.g., workers and nonworkers) who are onsite each day. Logbooks must be obtained from the field data coordinator for the INEEL Sample Management Office. The completed logbooks must be returned to the INEEL Sample Management Office within 6 weeks of project completion. The logbooks are then submitted to ER Document Control.

12.3 Idaho Completion Project Document Control

The Idaho Completion Project (ICP) Document Control organizes and maintains data and reports generated by ICP field activities. The ICP Document Control 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 project plans for ICP, this HASP, the ICP Management Plan (PLN-694), the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10 and Inactive Sites* (DOE-ID 2002), and other project-specific documents are maintained in the project file by ICP Document Control.

Completed sample logbooks are submitted to the Sample Management Office within 6 weeks of project completion. All other project records and logbooks, except industrial hygiene logbooks, must be forwarded to the Administrative Record and Document Control within 30 days after completion of field activities.

12.4 Site Attendance Record

If required to be maintained separately, the site attendance record will be used to keep a record of all personnel (i.e., field team members and nonfield team members) onsite each day, and to assist the area warden with conducting personnel accountability should an evacuation take place (see Section 10 for

emergency evacuation conditions). Personnel will only be required to sign in and out of the attendance record once each day. The FTL is responsible for maintaining the site attendance record and for ensuring that all personnel on the project site sign in (if required).

12.5 Administrative Record and Document Control Office

The Administrative Record and Document Control (ARDC) will organize and maintain data and reports generated by ICP 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 ICP, this HASP, the ICP Management Plan (PLN-694), the quality assurance project plan, and other documents pertaining to this work are maintained in the project file by the ARDC.

13. REFERENCES

10 CFR 835, 2002, "Occupational Radiation Protection," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

10 CFR 835.603b, 2002, "High Radiation Area," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

10 CFR 835.603d, 2002, "Airborne Radioactive Area," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

29 CFR 1910, Subpart Z, 2003, "Toxic and Hazardous Substances," *Code of Federal Regulations,* Office of the Federal Register, April 2003.

29 CFR 1910.120, 2003, "Hazardous Waste Operations and Emergency Response," Subpart Z, "Toxic and Hazardous Substances," *Code of Federal Regulations*, Office of the Federal Register, April 2003.

29 CFR 1910.132, 2003, "General Requirements," *Code of Federal Regulations*, Office of the Federal Register, April 2003.

29 CFR 1910.134, 2003, "Respiratory Protection," *Code of Federal Regulations*, Office of the Federal Register, April 2003.

29 CFR 1910.1000, 2003, "Air Contaminants," *Code of Federal Regulations*, Office of the Federal Register, April 2003.

29 CFR 1926, Subpart B, 2002, "General Interpretations," *Code of Federal Regulations,* Office of the Federal Register, December 2002.

29 CFR 1926, Subpart P, 2002, "Excavations," *Code of Federal Regulations*, Office of the Federal Register, December 2002.

29 CFR 1926.65, 2002, "Hazardous Waste Operations and Emergency Response," *Code of Federal Regulations*, Office of the Federal Register, December 2002.

54 FR 48184, 1989, "National Priorities List of Uncontrolled Hazardous Waste Sites; Final Rule," *Federal Register*, November 1989.

42 USC 9601 et seq., 2001, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund), *United States Code*, January 2001.

ACGIH, 2002, *Threshold Limit Values Booklet*, American Conference of Governmental Industrial Hygienists.

ANSI, 1968, "Practice for Occupational and Educational Eye and Face Protection, ANSI Z87.1-1968, American National Standards Institute.

ANSI, 1969, "Safety Requirements for Industrial Head Protection," ANSI Z89.1-1969, American National Standards Institute.

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory,* U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; State of Idaho Department of Health and Welfare, December 1991.

DOE-ID, 1997, *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory,* DOE/ID-10557, Rev. 0, U.S. Department of Energy Idaho Operations Office, November 1997.

DOE-ID-1998, *Proposed Plan for Waste Area Group 1 - Test Area North, Idaho National Engineering and Environmental Laboratory*, Document Number 10553, U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency Region 10, Idaho Department of Health and Welfare, November 1998.

DOE-ID, 1999, *Final Record of Decision, Test Area North, Operable Unit 1-10,* DOE/ID-10682, Rev. 0, U.S. Department of Energy Idaho Operations Office, December 1999.

DOE-ID, 2002, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites*, DOE/ID-10587, Rev. 7, U.S. Department of Energy Idaho Operations Office, September 2002.

DOE-ID, 2003a, *Comprehensive Remedial Design/Remedial Action Work Plan Addendum for V-Tanks Early Remedial Action for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 and 3 Sites,* DOE/ID-11075, Revision 0, U.S. Department of Energy Idaho Operations Office, May 2003.

DOE-ID, 2003b, *Field Sampling Plan for Early Remedial Action at Waste Area Group 1, Operable Unit 1-10,* DOE/ID-11065, Revision 0, Department of Energy Idaho Operations Office, May 2003.

DOE O 151.1A, 2000, "Comprehensive Emergency Management System," U.S. Department of Energy, November 2000.

DOE O 440.1A, 1998, "Worker Protection Management for DOE Federal and Contractor Employees," U.S. Department of Energy, March 1998.

DOE-STD-1090-01, 2001, "Hoisting and Rigging," U.S. Department of Energy, Rev. 3, April 2001.

EGG, 1983, *Final Report Decontamination and Decommissioning of TAN Radioactive Liquid Waste Evaporator System (PM-2A),* EGG-2236, Idaho National Engineering Laboratory, EG&G Idaho, March 1983.

Form 340.02, 2002, "Employee Job Function Evaluation," Rev. 9, August 8, 2002.

Form 361.24, 2000, "Tailgate Attendance Roster," Rev. 2, February 2, 2000.

Form 361.25, 1999, "Group Read and Sign Training Roster," Rev. 1, May 10, 1999.

Form 361.47, 2001, "HWO Supervised Field Experience Verification," Rev. 5, July 18, 2001.

Form 412.11, 2002, "Document Management Control Systems Document Action Request," Rev. 9, September 12, 2002.

Form 432.57, 1998, "Excavation Checklist," Rev. 0, February 23, 1998.

Form 433.01, 2002, "Outage Request," Rev. 4, October 21, 2002.

GDE-6212, 2002, "Hazard Mitigation Guide for Integrated Work Control Process," Rev. 1, September 19, 2002.

INEEL, 1994, *Preliminary Scoping Track 2 Summary Report for the Test Area North Operable Unit 1-05: Radioactive Contamination Sites*, INEL-94/0135, Revision 0, Idaho National Engineering and Environmental Laboratory, October 1994.

INEEL, 2001, "INEEL Training Directorate," Idaho National Engineering and Environmental Laboratory, Bechtel BWXT, LLC, Idaho Falls, Idaho, URL: http://train1.inel.gov/index.html.

INEEL, 2002, *Health and Safety Plan for the Decontamination and Dismantlement of the Liquid Waste Treatment Plant (TAN-616),* INEEL/EXT-2000-00808, Rev. 2, October 2002.

INEEL, 2003, *Waste Management Plan for V-Tanks Early Remedial Action for Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites*, INEEL/EXT-02-01608, Revision 0, May 2003.

MCP-7, 2002, "Radiological Work Permit," Rev. 17, *Manual 15B—Radiation Protection Procedures,* December 18, 2002.

MCP-8, 2002, "Self-Assessments Process for Continuous Improvement," Rev. 6, *Manual 13B—Quality and Requirements Management Procedures*, January 23, 2002.

MCP-93, 1999, "Health Physics Instrumentation," Rev. 12, *Manual 15B—Radiation Protection Procedures,* February 12, 1999.

MCP-137, 2002, "Radioactive Source Accountability and Control," Rev. 7, *Manual 15B—Radiation Protection Procedures,* April 4, 2002.

MCP-139, 2001, "Radiological Surveys," Rev. 10, *Manual 15C—Radiological Control Procedures,* September 7, 2001.

MCP-148, 2000, "Personnel Decontamination," Rev. 4, *Manual 15C—Radiological Control Procedures,* July 6, 2000.

MCP-153, 2002, "Industrial Hygiene Exposure Assessment," Rev. 6, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene,* October 22, 2002.

MCP-190, 2000, "Event Investigation and Occurrence Reporting," Rev. 9, *Manual 9—Operations,* September 1, 2000.

MCP-199, 2001, "Total Containment Glove Bags and Glove Boxes for Radiological Control," Rev. 4, *Manual 15B—Radiation Protection Procedures,* March 7, 2001.

MCP-425, 2003, "Radiological Release Surveys and the Disposition of Contaminated Materials," Rev. 6, *Manual 15B—Radiation Protection Procedures,* January 27, 2003.

MCP-432, 2000, "Radiological Personal Protective Equipment," Rev. 8, *Manual 15B—Radiation Protection Procedures,* July 6, 2000.

MCP-553, 2001, "Stop Work Authority," Rev. 5, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* November 16, 2001.

MCP-584, 1997, "Flammable and Combustible Liquid Storage and Handling," Rev. 2, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* February 1, 1997.

MCP-1194, 2003, "Logbook Practices for ER and D&D&D Projects," Rev. 1, *Environmental Restoration Work Processes Manual*, May 2003.

MCP-2692, 2002, "Preventing Ergonomic and Back Disorders," Rev. 3, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene,* October 31, 2002.

MCP-2703, 2000, "Carcinogens," Rev. 1, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene* September 11, 2000.

MCP-2704, 2002, "Heat and Cold Stress," Rev. 2, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene* April 17, 2002.

MCP-2707, 2001, "Compatible Chemical Storage," Rev. 4, *Manual 14A—Occupational Safety and Fire Protection,* February 13, 2001.

MCP-2709, 2001, "Aerial Lifts and Elevating Work Platforms," Rev. 3, *Manual 14A—Occupational Safety and Fire Protection*, February 13, 2001.

MCP-2720, 2002, "Controlling and Monitoring Exposures to Lead," Rev. 3, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene*, April 17, 2002.

MCP-2725. 2001, "Field Work at the INEEL," Rev. 3, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection*, January 12, 2001.

MCP-2726, 2003, "Respiratory Protection," Rev. 8, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene*, January 2003.

MCP-2739, 1997, "Material Handling, Storage, and Disposal," Rev. 0, *Manual 14A–Safety and Health-Occupational Safety and Fire Protection*, February 1 1997.

MCP-2745, 2001 "Heavy Industrial Vehicles," Rev. 1, *Manual 14A–Safety and Health-Occupational Safety and Fire Protection*, December 11, 2001.

MCP-2749, 2002, "Confined Spaces," Rev. 5, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene*, November 14, 2002.

MCP-2750, 2002, "Preventing Hantavirus Infection," Rev. 3, *Manual 14B—Safety and Health Occupational Medical and Industrial Hygiene*, April 17, 2002.

MCP-3003, 2002, "Performing Pre-Job Briefings and Post-Job Reviews," Rev. 11, *Manual 9—Operations,* May 2003.

MCP-3449, 2001, "Safety and Health Inspections," Rev. 2, *Manual 14A–Safety and Health-Occupational Safety and Fire Protection*, June 25, 2001.

MCP-3562, 2003, "Hazard Identification, Analysis and Control of Operational Activities," Rev. 6, *Manual 9—Operations*, January 16, 2003.

MCP-3650, 2001, "Chapter IX Level I Lockouts and Tagouts," Rev. 1, *Manual 9—Operations*, January 18, 2001.

MCP-3651, 2001, "Chapter IX Level II Lockouts and Tagouts," Rev. 2, *Manual 9—Operations,* January 18, 2001.

NFPA, 2000, *Electrical Safety Requirements for Employee Work Places*, NFPA 70E, National Fire Protection Association.

NIOSH, 1985, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institutional of Occupational Safety and Health/Occupational Safety and Health Administration/United States Coast Guard/U.S. Environmental Protection Agency, DHHS (NIOSH) Publication No. 85-115.

Occupational Safety and Health Department, 2003, *Manual 14A - Safety and Health—Occupational Safety and Fire Protection*, Rev. 121, May 3, 2003.

Occupational Safety and Health Department, 2003, *Manual 14B - Safety and Health—Occupational Medical and Industrial Hygiene*," Rev. 67, April 25, 2003.

PLN-114, 2003, "INEEL Emergency Plan RCRA Contingency Plan," Rev. 19, *Manual 16A–Emergency Preparedness Base Plan* February 25, 2003.

PLN-694, 2002, "Environmental Restoration Program Management Plan," Rev. 0, *Manual 7–Project Management,* November 2000.

PRD-5, 2002, "Boilers and Unfired Pressure Vessels," Rev. 5, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* June 21, 2002.

PRD-22, 1999, "Excavation and Surface Penetrations," Rev. 2, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* September 20, 1999.

PRD-25, 1999, "Activity Level Hazard Identification, Analysis, and Control," Rev. 2, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* June 30, 1999.

PRD-183, 2000, *Radiation Protection – INEEL Radiological Control Manual,* Rev. 6, *Manual 15A—Radiation Protection INEEL Radiological Control,* July 6, 2000.

PRD-600, 2003, "Hoisting and Rigging," Rev. 3, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* April 2003.

PRD-1004, 1997, "Stop Work Authority," Rev. 0, *Subcontractor Requirements Manual,* November 5, 1997.

PRD-1006, 1997, "Safety Surveillance," Rev. 0, *Subcontractor Requirements Manual,* November 5, 1997.

PRD-1007, 2002, "Work Coordination and Hazard Control," Rev. 5, *Subcontractor Requirements Manual,* February 21, 2002.

PRD-2001, 2001, "Personal Protective Equipment," Rev. 3, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2002, 2001, "Fall Protection," Rev. 3, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2003, 1997, "Ladders," Rev. 0, *Subcontractor Requirements Manual,* November 5, 1997.

PRD-2004, 2001, "Scaffolding," Rev. 2, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2005, 2001, "Walking and Working Surfaces," Rev. 1, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2006, 2001, "Aerial Lifts and Elevating Work Platforms," Rev. 1, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2007, 2003, "Hoisting and Rigging," Rev. 2, *Subcontractor Requirements Manual,* January 2, 2003.

PRD-2009, 1997, "Compressed Gases," Rev. 0, *Subcontractor Requirements Manual,* November 5, 1997.

PRD-2010, 2001, "Welding, Cutting, and Other Hot Work," Rev. 1, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2011, 2000, "Electrical Safety," Rev. 1, *Subcontractor Requirements Manual,* April 19, 2000.

PRD-2012, 2002, "Lockouts and Tagouts," Rev. 4, *Subcontractor Requirements Manual,* August 1, 2002.

PRD-2014, 2001, "Excavation and Surface Penetrations," Rev. 6, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2015, 2001, "Hand and Portable Power Tools," Rev. 4, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2016, 2001, "Material Handling, Storage, and Disposal," Rev. 2, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2019, 1998, "Motor Vehicle Safety," Rev. 1, *Subcontractor Requirements Manual,* January 30, 1998.

PRD-2020, 2001, "Heavy Industrial Vehicles," Rev. 2, *Subcontractor Requirements Manual,* June 1, 2001.

PRD-2022, 1998, "Safety Signs, Color Codes, and Barriers," Rev. 1, *Subcontractor Requirements Manual,* January 30, 1998.

PRD-2107, 2001, "Heat and Cold Stress," Rev. 2, *Subcontractor Requirements Manual*, June 1, 2001.

PRD-2108, 2001, "Hearing Conservation," Rev. 1, *Subcontractor Requirements Manual*, June 1, 2001.

PRD-2109, 2000, "Respiratory Protection," Rev. 2, *Subcontractor Requirements Manual*, April 19, 2000.

PRD-2110, 1998, "Confined Spaces," Rev. 1, *Subcontractor Requirements Manual*, January 30, 1998.

PRD-2201, 2000, "Flammable and Combustible Liquid Storage and Handling," Rev. 2, *Subcontractor Requirements Manual*, April 19, 2000.

PRD-5038, 2003, "Cryogenic Systems," Rev. 0, *Manual 14A–Safety and Health-Occupational Safety and Fire Protection*, April 2003.

PRD-5040, 2002, "Handling and Use of Compressed Gases," Rev. 1, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* May 14, 2002.

PRD-5067, 2001, "Ladders," Rev. 3, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* October 30, 2001.

PRD-5096, 2001, "Fall Protection," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* January 9, 2001.

PRD-5098, 2001, "Scaffolding," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* January 9, 2001.

PRD-5099, 2002, "Electrical Safety," Rev. 3, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* September 18, 2002.

PRD-5101, 2001, "Portable Equipment and Handheld Power Tools," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* April 25, 2001.

PRD-5103, 2001, "Walking and Working Surfaces," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* March 6, 2001.

PRD-5110, 2001, "Welding, Cutting, and Other Hot Work," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* July 31, 2001.

PRD-5117, 2001, "Accident Prevention Signs, Tags, Barriers, and Color Codes," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* September 3, 2001.

PRD-5121, 2003, "Personal Protective Equipment," Rev. 2, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* January 31, 2003.

PRD-5123, 2002, "Motor Vehicle Safety," Rev. 0, *Manual 14A—Safety and Health—Occupational Safety and Fire Protection,* August 2002.

Radiological Control Department, 2003, *Manual 15B - Radiation Protection Procedures,* Rev. 112, April 23, 2003.

Radiological Control Department, 2003, *Manual 15C - Radiological Control Procedures,* Rev. 42, January 28, 2003.

Radiological Control Department, 2002, "Radiological Control and Information Management System," URL: http://radcon.inel.gov/

STD-101, 2002, "Integrated Work Control Process," Rev. 13, October 21, 2002.

GDE-140, 2003, "Decontaminating Sampling Equipment," Rev. 0, April 22, 2003.

TPR-6575, 2001, "Decontaminating Sampling Equipment in the Field," Rev. 0, May 23, 2001.

Waste Management, 2003, *Manual 17 – Waste Management,* Rev. 45, May, 2003.