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Plan

Project No. 25250

Miscellaneous Sites Cleanup Project Health and Safety Plan

Idaho Cleanup Project

The Idaho Cleanup Project is operated for the
U.S. Department of Energy by CH2M•WG Idaho, LLC

ABSTRACT

The "Miscellaneous Sites Cleanup Project Health and Safety Plan" establishes controls and requirements used to eliminate or minimize health and safety risks to personnel performing work for the Miscellaneous Sites Cleanup Project, including Comprehensive Environmental Response, Compensation, and Liability Act; Resource Conservation and Recovery Act; and the Voluntary Consent Order. This Plan has been prepared to meet Occupational Safety and Health Administration standards contained in the "Hazardous Waste Operations and Emergency Response" requirements (29 CFR 1910.120 and 29 CFR 1926.65). It contains the work scope, hazard identification, and general mitigation of safety, health, and radiological hazards for conducting work activities within the Miscellaneous Sites Cleanup Project. Safety, health, and radiological professionals assigned to this project will use this health and safety plan as the basis for planning and hazard mitigation. Additional hazard controls and mitigation measures specific to projects under the Miscellaneous Sites Cleanup Project will be included in procedures, job safety analysis, or other project-specific work control documents based on project-specific work scope, conditions, and methods not defined in this document.

The Miscellaneous Sites Cleanup Project assigned safety and health professionals, in conjunction with other project personnel and management, will determine the most appropriate hazard control and required mitigation measures for Miscellaneous Sites Cleanup Project activities based on project-specific conditions, and will make changes to project-specific work control documents, as appropriate.

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ACRONYMS

ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
dBA	decibel A-weighted
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
FHPA	fall hazard prevention analysis
FTL	field team leader
HAZWOPER	hazardous waste operations and emergency response
HEPA	high-efficiency particulate air
HSO	health and safety officer
ICDF	Idaho CERCLA Disposal Facility
ICP	Idaho Cleanup Project
IDLH	immediately dangerous to life and health
IH	industrial hygienist
INL	Idaho National Laboratory (formerly Idaho National Engineering and Environmental Laboratory [INEEL])
INTEC	Idaho Nuclear Technology and Engineering Center
ISMS	Integrated Safety Management System
JSA	job safety analysis
JSS	job site supervisor
MCP	management control procedure

MSCP	Miscellaneous Sites Cleanup Project
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PDD	program description document
PLN	plan
PPE	personal protective equipment
PRD	program requirements document
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD/RA	Remedial Design/Remedial Action
RW	radiation worker
RWMC	Radioactive Waste Management Complex
RWP	radiological work permit
SCBA	self-contained breathing apparatus
STD	standard
STF	Security Training Facility
STR	subcontractor technical representative
SWP	safe work permit
TRAIN	Training Records and Information Network
TWA	time-weighted average
UXO	unexploded ordnance
VCO	Voluntary Consent Order
VPP	Voluntary Protection Program
WAG	waste area group

1. INTRODUCTION

1.1 Purpose

This health and safety plan establishes controls and requirements used to eliminate or minimize health and safety risks to personnel and/or subcontractors performing work for the Miscellaneous Sites Cleanup Project (MSCP), including Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Resource Conservation and Recovery Act (RCRA); and the Voluntary Consent Order (VCO). This Plan has been prepared to meet Occupational Safety and Health Administration (OSHA) standards contained in the "Hazardous Waste Operations and Emergency Response" requirements (29 CFR 1910.120 and 29 CFR 1926.65). All required components of a health and safety plan are included in this document or available in the associated work control documents.

This Plan addresses the topics identified in 29 CFR 1910.120 and 29 CFR 1926.65. Table 1-1 identifies each of these required topics and associated section within the Plan. Additional information is available in the project-specific documents and company procedures.

This Plan identifies the overall work scope, hazard identification, and associated mitigation of safety, health, and radiological hazards for conducting work within the MSCP. Work planning, safety, health, and radiological professionals assigned to support this project will use this Plan as the basis for planning and hazard mitigation. Additional hazard controls and mitigation measures specific to projects under the MSCP will be further defined based on project-specific work scope, conditions, and methods. This Plan does not require revision for project-specific information.

This Plan is intended to give safety and health professionals the flexibility to establish and modify site safety and health procedures throughout the entire span of site operations based on the existing and anticipated hazards. The MSCP assigned health and safety officer (HSO) will determine the most appropriate hazard control and required mitigation measures based on site-specific conditions. The discovery of new hazards not identified in this document will be addressed in project work control documents and does not require a modification to this document for work continuance. For example, the project must

- Complete a specific organization chart with names and organization structure of the project or activity; discuss it in the pre-job briefing, and make it available at the work location
- Determine the number, type, and size of fire extinguishers prior to starting work and ensure their availability when work begins
- Develop a training qualified watch list that identifies the training requirements for personnel assigned to the work
- Develop an emergency contact list specifically for the work location, assigned project personnel, and management contacts
- Obtain an emergency evacuation diagram for work inside a facility boundary and discussed in the pre-job briefing
- Communicate the location of the nearest dispensary and document it in the pre-job briefing.

Table 1-1. Matrix identifying compliance with required health and safety plan elements.

Required Elements	Location in Health and Safety Plan	Work Control Document(s) Addressing Element[a]	Company Document Addressing Element[a]
Work scope	1.2, 1.3	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit)	MCP-3562 STD-101
Site description	1.2	Remedial Design/Remedial Action Work Plan; Field Sampling Plan	N/A
Organization roles and responsibilities	2	Project-specific organization chart posted at project site; organization chart in field team leader, subcontractor technical representative, or sample logbook	MCP-1432 PLN-2087
Hazard identification and mitigation	3	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit)	MCP-3480 MCP-3562 PRD-25 PRD-4001 PRD-5030 STD-101
Confined space entry procedures	3.5.9	Confined Space Entry Permit 442.06 Confined Space Hazard Evaluation Form 442.09	MCP-2749
Accident and exposure prevention	4	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit)	Voluntary Protection Program Integrated Safety Management System
Site controls	5	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit); interface agreements	MCP-3480 PRD-2022 PRD-4001 PRD-5030 PRD-5117
Training requirements	6	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit); project-specific training qualified watch list	MCP-3480 PDD-1033 PRD-5030
The content and frequency of pre-entry briefings	6.2	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, Confined space permit)	MCP-3003

Table 1-1. (continued).

Required Elements	Location in Health and Safety Plan	Work Control Document(s) Addressing Element[a]	Company Document Addressing Element[a]
Monitoring	7	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, Confined space permit)	MCP-2719 MCP-2720 MCP-2721 MCP-2862
Personal protective equipment	8	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, confined space permit)	MCP-432 PRD-5121
Medical surveillance requirements	9	N/A	MCP-2748 MCP-3480 MCP-9439 DOE G 440.1-4
Emergency response plan, including necessary personal protective equipment and other equipment	10	N/A	MCP-2748, PLN-114,
Spill containment measures	10.3.3	N/A	MCP-3480 PLN-114 PRD-4001 PRD-5030
Decontamination procedures	10.4	ICP integrated work control process which includes: STD-101 work order; operating procedure(s); job safety analysis(s); applicable work permit(s) (e.g., RWP, FHPA, Confined space permit)	MCP-148 MCP-1116
Standard operating procedures, if applicable	N/A	Technical procedure, Sampling and Analysis Plan	MCP-2985 MCP-3480 MCP-3562 MCP-9439

a. Information included but not limited to the list provided

FHPA = fall hazard prevention analysis
ICP = Idaho Cleanup Project
MCP = Management Control Procedure
PDD = Program Description Document
PLN = Plan
PRD = Program Requirements Document
STD = Standard
RWP = Radiological Work Permit

1.2 Overall Scope and Objectives

The MSCP has overall responsibility for CERCLA activities and the VCO Program. The "Project Execution Plan for the Miscellaneous Sites Cleanup," PLN-2087, identifies the work scope to be completed under this health and safety plan.

The MSCP is one of the four cleanup areas specified under the Idaho Cleanup Project (ICP) and includes:

- Programmatic responsibility for all ICP CERCLA activities with the exception of operation of the Idaho CERCLA Disposal Facility (ICDF), Waste Area Group (WAG) 7 specific remedial actions, and decontamination and decommissioning work performed under CERCLA removal actions
- Programmatic responsibility and coordination for all VCO characterization and closure at the Reactor Technology Complex[a]
- Long-term stewardship activities, including groundwater monitoring
- Implementation and maintenance of institutional control actions
- Coordination and resolution of RCRA/CERCLA (42 USC § 6901 et seq.; 42 USC § 9601 et seq.) interface issues.

This health and safety plan governs work for CERCLA and/or RCRA/VCO closure projects performed by MSCP management and personnel, functional support personnel, other contractor personnel, subcontractors, and other personnel who enter the project or work area.

1.3 Scope of Work

The MSCP organization implements the scope identified in PLN-2087. Both CERCLA activities and RCRA closure activities will be conducted under the MSCP and are discussed in this section.

The following is a list of CERCLA activities to be performed by the MSCP:

- Operable Unit 3-13, Group 1, Tank Farm Interim Action
- Operable Unit 3-13, Group 2, Soils Under Building and Structures
- Operable Unit 3-13, Group 3, Other Surface Soils, Phase I and Phase II remediation field sampling activities
- Operable Unit 3-13, Group 4, Perched Water
- Operable Unit 3-13, Group 5, Snake River Plain Aquifer
- Operable Unit 3-13, Group 7, SFE 20 Hot Waste Tank System
- Operable Unit 10-04, Sitewide Issues

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a. Beginning February 1, 2005, the name of the Idaho National Engineering and Environmental Laboratory (INEEL) was changed to Idaho National Laboratory (INL). The Test Reactor Area was renamed the Reactor Technology Complex.

- Operable Unit 10-04, Phase II, TNT/RDX Contaminated Soils
- Operable Unit 10-01, Phase III, Security Training Facility (STF)-02 Gun Range
- Operable Unit 10-04, Phase IV, Unexploded Ordnance (UXO) Contaminated Sites
- Operable Unit 10-08, Groundwater Monitoring.

The following RCRA activity under the VCO will be performed by the MSCP:

- Reactor Technology Center VCO actions including the catch tank system and SITE-TANK 005 RCRA closure actions.

1.3.1 Specific Miscellaneous Sites Cleanup Project Work Scope

The following sections briefly describe the work scope performed by MSCP. Additional information is available in the project-specific documentation.

1.3.1.1 Long-Term Stewardship. Field activities under long-term stewardship include sitewide institutional controls inspections at approximately 160 sites and conducting operations and maintenance inspections for subsidence, burrowing, and weed encroachment at approximately 25 sites. Typically, activities include performing radiation surveys using a hand-held frisker, backpack unit, or vehicle-mounted detector. The scope also includes conducting revegetation and weed control activities at up to approximately 40 sites throughout the Idaho National Laboratory (INL).

Based on the results of previous operations and maintenance inspections, periodic maintenance/repairs are anticipated. These repairs may include activities such as backfilling of subsidence areas or other cap repairs. Backfilling activities may require the use of heavy equipment such as dump trucks, loaders, and compactors. Revegetation activities may include use of a hand tool(s) for small areas and the use of a mechanically operated drill. Weed control activities include herbicide application of sites that show the presence of noxious or invasive weed species (per MCP-3480, "Environmental Instructions for Facilities, Processes, Materials and Equipment").

1.3.1.2 OU 10-04 Phase I – Operations and Maintenance Activities. Phase I remediation for Operable Unit 10-04 includes removal or isolation of identified surface unexploded ordnance (UXO) and trinitrotoluene/Royal Demolition Explosive fragments that pose an unacceptable near-term physical hazard. Surface UXO and trinitrotoluene/Royal Demolition Explosive fragments identified in Phase I during routine operations will be assessed by explosives experts and may be removed and disposed of or isolated in an exclusion zone if they pose an unacceptable near-term physical hazard. Removal or isolation activities during Phase I will not initiate full remediation of the contaminated areas. Full remediation will be performed in subsequent phases.

1.3.1.3 OU 10-04 Phase II – Remediation of* Trinitrotoluene/Royal Demolition Explosive *Contaminated Soil Sites Phase II addresses removal and destruction of trinitrotoluene/Royal Demolition Explosive fragments found on five sites within the INL Site and remediation of contaminated soils. The five sites located inside the Naval Proving Ground are:

1. Fire Station II Zone and Range Fire Burn Area

2. Experimental Field Station
3. Land Mine Fuse Burn Area
4. National Oceanic and Atmospheric Administration Site
5. Naval Ordnance Disposal Area.

The remediation of the trinitrotoluene/Royal Demolition Explosive contaminated soil sites will includes institutional controls, as required, until the contamination is removed or reduced to acceptable levels, performing a visual survey to identify any UXO and trinitrotoluene/Royal Demolition Explosive fragments and stained soil coupled with a geophysical survey for UXO, excavation of contaminated soils, segregation and disposal of trinitrotoluene/Royal Demolition Explosive fragments at the Mass Detonation Area, sampling and analysis of soils to determine excavation requirements and when the remediation goals have been met, backfilling and contouring excavated areas, revegetating affected areas, and monitoring air and soil during the remedial action.

1.3.1.4 OU 10-04 Phase III – Remediation of the STF-02 Gun Range. The Phase III remediation addresses the lead-contaminated soils at the Security Training Facility (STF)-02 Gun Range. Field activities may include excavating contaminated soils; physically separating copper and lead for recycling; returning separated soils below the remediation goal to the site; stabilizing contaminated soils, as required and disposing of the separated soils that exceed the remediation goal; encapsulating and disposing of creosote-contaminated railroad ties; removing and disposing of the wooden building and asphalt pads found at the STF-02 Gun Range; sampling and analyzing soil to determine the excavation requirements; and when the remediation goals have been met, backfilling and contouring excavated areas, and revegetating the affected area.

1.3.1.5 OU 10-04 Phase IV – Remediation of Unexploded Ordnance Contaminated Sites. Phase IV remediation addresses the areas having the potential for unexploded ordnance at the INL. These areas include portions of the Naval Proving Ground, the Arco High Altitude Bombing Range, and the Twin Butte Bombing Range. Five areas within the Naval Proving Ground that are known to contain unexploded ordnance are the (1) Naval Ordnance Disposal Area, (2) Mass Detonation Area, (3) Experimental Field Station, (4) Rail Car Explosion Area, and (5) Land Mine Fuse Burn Area. The remedial action will be concentrated in these five areas.

Following the removal and disposal of ordnance by high-order detonation, the Mass Detonation Area will be sampled to determine the extent, if any, of soil that may have been contaminated by the detonation activities associated with the disposal of ordnance during the Phase IV activities and explosives during the Phase II activities. Remediation of the contaminated soil at the Mass Detonation Area may include sampling and analysis of soil to determine excavation requirements, excavating contaminated soil, and backfilling and contouring excavated areas; revegetating affected areas; and monitoring air and soil during the remedial action.

1.3.1.6 Well Services. This scope includes new well drilling and construction services, geophysical logging activities, routine and non-routine maintenance of existing monitoring wells, and well abandonment. Specifically, this scope includes the following:

- Annual surveillance of monitoring wells from to identify and prioritize well maintenance activities.

- Preventative well maintenance and repairs on approximately 40 wells annually. Unscheduled maintenance and repairs will be performed as needed and identified by samplers, surveillance personnel, and/or auditors.

- Installation and logging of soil borings and core holes; Snake River Plain Aquifer, perched water, and vadose zone monitoring wells; and instrumented boreholes.

- Annual maintenance and scheduling of the Gamma Spectroscopy Logging System/video logging system and Geophysical Logging Van.

- Annual and special groundwater sampling of groundwater wells.

- Design and retrofit four existing wells with multilevel samplers.

1.3.1.7 Well Abandonment. This work includes abandonment of up to 80 monitoring wells per year, as practicable, for a maximum of 550 wells. An evaluation of the ICP groundwater monitoring network will be performed to identify candidate wells with well owner and/or custodian input and to prioritize well abandonment.

1.3.1.8 Routine Groundwater Monitoring. The work includes the groundwater monitoring, water level measurements, and vadose zone monitoring necessary to support ICP and CERCLA groundwater monitoring responsibilities. It includes all work necessary to prepare for the sampling events, collect and analyze the groundwater samples, review their significance, validate the analyses, enter data into the Environmental Data Warehouse, and prepare and transmit limitations and validation reports.

1.3.1.9 Ecological Monitoring. The areas of the INL Site to be investigated may include the Central Facilities Area (CFA), the Radioactive Waste Management Complex (RWMC), the Materials and Fuels Complex (MFC),[b] the MFC industrial waste pond, on-Site terrestrial reference area, and off-Site aquatic reference area. Work scope may include moving sample plots or collecting opportunistic plant, soil or small mammal samples at the areas of concern if possible indicators (e.g., stained soil or mutated animals) of contaminant exposure are evident. Analytical data collection will include biotic (e.g., mice) and abiotic (e.g., soil) samples. Effects data will range from vegetative cover and small mammal population surveys to histopathic studies of mice.

1.3.1.10 Soil Excavation and Remediation. Operable Unit (OU) 3-13, Group 3, Other Surface Soils, consists of excavating and/or transporting contaminated soils or debris from various Idaho Nuclear Technology and Engineering Center (INTEC) CERCLA sites to the ICDF as defined in the *Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13,* (DOE-ID 1999). This work scope includes activities to complete Phase I remediation. Phase II addresses Remediation Sets 4, 5, and 6. Responsibility for Group 3 institutional controls and operations and maintenance activities is to be performed under the ICP Long-Term Stewardship Program following active remediation.

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b. Beginning February 1, 2005, the name of the Idaho National Engineering and Environmental Laboratory (INEEL) was changed to Idaho National Laboratory (INL). Argonne National Laboratory-West was re-named the Materials and Fuels Complex (MFC).

Work under the OU 3-13 Group 3, Other Surface Soils, Phase II Work Plan includes the remediation of approximately 22 contaminated soil sites. The selected remedy for theses sites is removal and on-Site disposal in the ICDF. The major components of the selected remedy for the Group 3, Phase II release sites include:

- Excavation of contaminated soil
- Soil disposal at the ICDF
- Soil sampling to confirm that the soil remediation goals have been achieved
- Real-time soil screening results for contamination left in place at depths below 10 ft for institutional controls
- Backfilling the excavated areas with clean soil, and contouring and grading the area to provide appropriate site drainage
- Placing gravel or revegetating the site, as appropriate.

At the completion of the remedial action, revised institutional controls consisting of signs, access control, and land use restrictions may be established and maintained, depending on results of the confirmatory sampling.

1.3.1.11 SFE-20 Hot Waste Tank. The SFE-20 hot waste tank remediation project is divided into two phases. The remaining Phase I activities include:

- For the tank and its contents, completing an inspection of the cargo container, transporting the cargo container to the treatment facility, consolidating samples into a shipping container, transporting the samples to the treatment facility, arranging for disposal at the Nevada Test Site, and shipping the tank and treated waste to the Nevada Test Site
- For the field work, remaining scope includes repackaging the vault lid, transporting the lid, disposal of the lid at ICDF, rebuilding the MW-15 well, and removing the contamination area and radiological buffer area.

Phase II work encompasses the removal and disposal of the contaminated soil, the remaining structures, and the tank vault. Phase II activities include:

- Tank vault, pump pit, tunnel, and CPP-642 building removal
- Contaminated soils removal and disposal of at the ICDF
- Confirmatory sampling and related risk analysis to verify remedial action objectives are met.

1.3.1.12 Tank Farm Inspections. This work includes the activities necessary to inspect, monitor, and maintain the items that have been installed during performance of the WAG 3, Operable Unit (OU) 3-13, Group 1, Tank Farm Interim Action. The activities include routine inspections of the tank farm surface-sealed areas, control zone asphalt-paved areas, the storm water collection system

(concrete-lined drainage ditches, culverts, and the lift station), as well as monitoring the evaporation pond, monitoring liner integrity, and equipment/material maintenance.

Inspection, monitoring, and maintenance activities are anticipated to continue until the final remedy for OU 3-14 Tank Farm Soil and Groundwater is completed including the following activities:

- Inspect and clean concrete-lined ditches and culverts in and around the tank farm extending to the evaporation pond Olive Avenue Lift Station (CPP-1792)
- Inspect and clean the evaporation pond with double liner, perimeter fencing, and leak detection system
- Inspect and maintain the asphalt coverings over selected areas within 150 ft of the tank farm (150-ft control zone)
- Inspect and maintain the asphalt surface-seal over release Sites CPP-28, -31, and -79 in the tank farm
- Inspect and clean the drainage system from the surface-sealed areas to the concrete-lined ditches.

1.3.1.13 Water Level Measurements. The perched water monitoring activities include monthly manual perched water level measurements with an electric tape in all perched wells, continuous automated water level measurements in selected perched wells using pressure transducers and data loggers, quarterly downloads of all automated water level data, and maintenance of all instrumentation. In addition, perched water levels in wells around the ICDF and outside the INTEC facility fence are monitored and maintained on a similar schedule.

1.3.1.14 Reactor Technology Center Voluntary Consent Order Actions. Several components of the TRA-007 Warm Waste System have been characterized as having managed hazardous waste and are undergoing RCRA closure under the SITE-TANK 005 RCRA Closure Actions. System components include the TRA-603 reactor drain tank, reactor drain tank vault, reactor drain tank pump and containment vault drain line, and the Materials Test Reactor canal sump, also located in TRA-603. Field activities will include closure via cleaning and/or removal of the components noted above.

Work scope also includes closure of the catch tank system the potentially contains transuranic wastes. These components include line 4-in. HDC-604B, line 4-in. HDC-632, the TRA-632 Hot Cell Drain System, and the TRA-630 Pump Vault. These components contain transuranic waste on the order of 3,100 nanocuries per gram with radiation levels of up to approximately 10,000 R/hr. This work scope may also include constructing an interim RCRA landfill over the TRA-632 hot drain system using the TRA-632 hot cell building as a cap. The landfill may require installation of new monitoring wells for long-term monitoring of the groundwater around/under the landfill.

1.4 Boundaries

Interface agreements or task baseline agreements are prepared and approved by the project and facility management to ensure that boundaries, duties, and responsibilities are assigned. These agreements, statements of work, and tenant use agreements identify activities necessary to accomplish tasks, the responsible performing organization, and the responsible manager. A project or work activity-specific agreement should be prepared for all activities conducted inside established facility boundaries

unless it is deemed a non-exclusive use area project. Section 10.4 of PLN-2087 further explains these agreements.

Project activities that cannot be isolated from facility operations are considered "Nonexclusive-Use Area Project" under MSCP and the facility shares in the responsibility and accountability for the project activities. Non-exclusive use activities funded by MSCP, but performed by others, will be conducted under IAG-368, "Interface Agreement Between Miscellaneous Sites Nonexclusive-use Projects at the INTEC and Test Area North/Reactor Technology Complex/Power Burst Facility Areas."

This agreement supplements existing company-level programs and procedures including Integrated Safety Management System (ISMS), Conduct of Operations, Conduct of Maintenance, and the Voluntary Protection Program (VPP). Additionally, it clearly defines responsibilities, controls, and boundaries necessary for safe and efficient operations and maintenance activities within the various facilities.

1.5 Work Authorization

The MSCP Operations manager is responsible for all operational activities at exclusive-use MSCP projects. Scheduled work scope must appear on the MSCP plan-of-the-week (POW) prior to work commencement and must be approved by the MSCP Operations Manager. PLN-2087 identifies the work authorization of MSCP controlled work.

Non-exclusive use activities performed by MSCP shall be under the area facility manager who must be cognizant of work being conducted in the facility. Specific roles and responsibilities will be defined in a project Interface Agreement, Tenant Use Agreement, or Statement of Work. All activities will be scheduled through the facility as well as through work control documents and procedures, which will be referred to daily as required. The field team leader (FTL)/subcontractor technical representative (STR) (or designee) will provide authorization (i.e., signature on the work control document or technical procedure) to initiate daily activities.

1.6 Subcontracted Work

The subcontractor is responsible for jobsite supervision and HSO responsibilities for all subcontracted projects under the MSCP. The MSCP-assigned STR or FTL may act as the point of contact for all MSCP subcontracted work. Subcontractor personnel functioning as HSO shall meet the requirements outlined in Section 2.2.2 of this Plan. MSCP-assigned safety professionals will act in an oversight role when work is subcontracted unless specifically addressed in the contract special conditions.

2. MSCP PERSONNEL RESPONSIBILITIES

The organizational structure for MSCP reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the public. Key MSCP positions, lines of responsibility, and communication are shown on the organization chart in MCP-1432, "Roles and Responsibilities of the Miscellaneous Sites Personnel."

This section further defines the project-specific roles and responsibilities of the MSCP personnel conducting work. An example of a project-specific organization chart is included in Figure 2-1 identifying key field positions at the project-specific level that may be employed to complete field activities. This organization chart is designed to be filled out manually with names and posted at the project site or placed in the FTL/STR logbook or placed with work control documents. It should also be discussed in the initial pre-job briefing and following any additions or changes to personnel assignments. This organization chart is not all-inclusive and is intended to identify the structure for key resources assigned to complete project-specific activities.

Matrixed resources may be used throughout the MSCP project. Matrixed personnel (e.g., environmental coordinator) report directly to the functional support manager and indirectly to the line organization.

PLN-2087 and MCP-1432 detail roles and responsibilities for program personnel conducting ICP work at the INL Site.

NOTE: *Roles and responsibilities of matrixed personnel may be identified through other company roles, responsibilities, accountabilities, and authorities.*

2.1 Project Management Team

The project team management, headed by the MSCP director, is responsible for developing and managing the project and coordinating project operations. The director ensures operations, compliance, surveillance, and monitoring activities are conducted in accordance with applicable ICP MCPs and program requirements documents (PRDs), and all applicable OSHA, U.S. Environmental Protection Agency, DOE, U.S. Department of Transportation, and State of Idaho requirements. The director is responsible for the overall work scope, schedule, and budget for this project. The director reports directly to the MSCP area project manager. The project manager reports directly to the director with roles and responsibilities identified in Section 2.1.1 of this Plan.

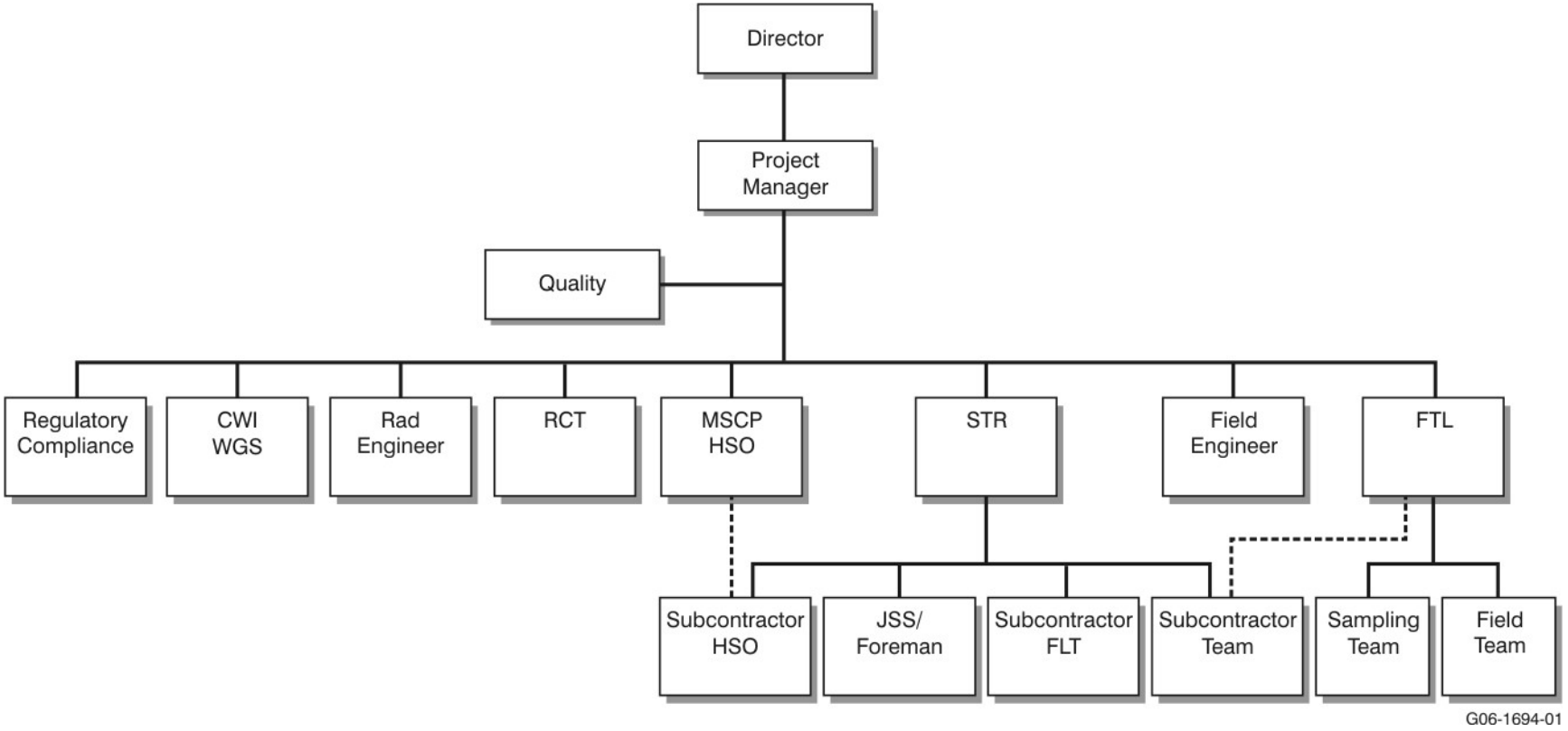


Figure 2-1. Typical example of key field positions at the project-specific level, showing solid lines of authority and dotted lines of communication.

2.1.1 Project Manager

The project manager will ensure that all activities conducted during the project comply with ICP MCPs and PRDs; all applicable OSHA, Environmental Protection Agency, DOE, U.S. Department of Transportation, and State of Idaho requirements; and that activities comply with applicable company policies and procedures, the Quality Assurance Project Plan, this Plan, and the Sampling and Analysis Plan. The project manager coordinates all document preparation, field, laboratory, and modeling activities.

The project manager:

- Provides day-to-day supervision of project team members during execution of project scope
- Works specifically with the MSCP functional managers to acquire resources necessary to complete project work scope
- Ensures project roles and responsibilities are fulfilled, interfaces completed, and oversight performed in accordance with Guide (GDE)-51, "Construction Project Management Guide," and MCP-9106, "Management of Construction Projects"
- Ensures facility interface documents for project field activities are developed and maintained to ensure project work is safely accomplished within the guidelines of ISMS, Conduct of Operations, Conduct of Maintenance, and other applicable requirements
- Ensures project field work is scheduled on appropriate plans of the week and plans of the day
- Determines whether a site attendance logbook is necessary prior to work commencement.

The project manager will define the level of FTL coverage based on the project needs. If the project manager requires full-time FTL coverage and the FTL leaves the site, an alternate will be appointed and that information shall be communicated to all field personnel and documented in the FTL logbook. The level and amount of HSO coverage will be based on the project needs identified by the project manager, with concurrence from the HSO. An STR may be assigned to MSCP subcontracted work by the project manager based on project needs and identified by the project manager.

The MSCP project manager is responsible for the overall work scope, schedule, and budget. The MSCP project manager will ensure that an Employee Job Function Evaluation is completed for all project employees, reviewed by the project HSO for validation, and then submitted to the Occupational Medical Program for determination of whether a medical evaluation is necessary. The project manager reports directly to the director.

2.2 Field Project Responsibilities

2.2.1 Field Team Leader

MSCP may supply or utilize functional support personnel to staff an FTL position and may seek the services of an STR for jobs where subcontract personnel are used. Projects normally conducted by the maintenance organization have no STR and normally function with an MSCP-assigned FTL. Both positions may be necessary in some cases, but the authority to staff particular positions outlined below

remains within the MSCP organization. Functional support personnel from other organizations may support MSCP activities and serve as one of the many field positions while conducting such activities.

The FTL is responsible for the safe and successful completion of the project activities. The FTL may be from another organization providing functional support services to MSCP activities. The FTL will manage activities and execute the applicable field sampling plans, technical procedures, and other project-specific documents. The FTL serves as the lead for all routine monitoring activities and may temporarily serve as the health and safety officer based on the qualifications and complexity of the activities. The FTL ensures site control, documents activities, and may conduct daily prejob briefings at the start of the shift. Health and safety issues must be brought to the attention of the FTL. The FTL will report project status on a regular basis to the project manager. Additional responsibilities include, but are not limited to, the following:

- Ensuring all field activities are conducted in compliance with technical procedures, work control documents, and associated ISMS requirements
- Ensuring field team personnel comply with facility-specific and operations requirements (as applicable)
- Obtaining and coordinating resources needed to implement the fieldwork, including equipment, labor, administrative, and technical permits with approvals
- Maintaining facility interface to schedule routine monitoring activities through the facility plan of the day
- Directing subcontract sampling team personnel supporting activities at the project site.

The level of FTL coverage will be based on the project needs identified by the project manager and documented in the FTL logbook. If the project manager requires full-time FTL coverage and the FTL leaves the site, an alternate will be appointed and that information shall be communicated to all field personnel and documented in the FTL logbook. Persons acting as FTL must meet all the FTL training requirements outlined under the ICP Miscellaneous Sites Field Leader Job Code (MSFLCPWAGS).

2.2.2 Health and Safety Officer

The HSO represents the MSCP organization and is assigned to the project site, serving as the primary contact for all health and safety issues. The HSO advises the FTL/STR on all aspects of health and safety has the authority to step back or stop work at the task site if any operation threatens worker or public health or safety. The HSO is authorized to verify compliance to this Plan, conduct inspections and self-assessments, require and monitor corrective actions, and monitor decontamination procedures as appropriate. The safety and health professionals at the project site (e.g., safety professional, industrial hygienist [IH], environmental coordinator, and facility representative) who support the MSCP health and safety officer also report directly to the MSCP organization.

Persons assigned as the HSO or alternate HSO must be qualified (in accordance with the definition in 29 CFR 1910.120) to recognize and evaluate hazards and will be given authority to take or direct actions to ensure that workers are protected. While the HSO may also be the IH, safety professional, or, in some cases, the FTL (depending on the hazards and complexity of the activity involved), other

project site responsibilities of the HSO must not interfere with the primary role of the HSO at the project site. The MSCP safety and health lead or the MSCP safety, engineering, and work planning director shall approve the HSO. This approval may be documented in the FTL or sampling logbook.

The amount of HSO coverage will be based on the project needs identified by the project manager. If the project manager requires full-time HSO coverage and the HSO leaves the project site, an alternate will be appointed and that information shall be communicated to all field personnel and documented in the FTL logbook. Persons acting as HSO must meet all the HSO training requirements outlined below:

Three levels of HSO defined herein:

- Level I HSO - can be used at a site where Level D personal protective equipment (PPE) is required and anticipated throughout the project scope

- Level II HSO - shall be assigned when Level C PPE is required and/or industrial hygiene monitoring is likely needed to evaluate potential exposure

- Level III HSO - shall be used on Level A and B PPE work sites and/or industrial hygiene monitoring is likely needed to evaluate potential exposure.

The requirements for each HSO level are as follows:

- The minimum requirements for being an HSO is 40-hr hazardous waste operations and emergency response (HAZWOPER) training, 8-hr refresher (if 40-hr training has expired), and 8-hr HAZWOPER training for supervisors

- A Level 1 HSO may be a line supervisor/manager that has work experience on projects of similar size and stature, and the ability to implement and verify that the project activities comply with the health and safety plan

- A Level II HSO shall have an Associate's degree or the equivalent in Industrial Hygiene, Health Physics, Industrial Safety, or another related field (work experience can be substituted if the amount and type correspond appropriately to project needs)

- A Level III HSO shall have certification or eligibility for certification in Industrial Hygiene, Industrial Safety, or a related field. For CWI, this is a company-qualified IH, safety engineer, or radiological control technician.

Subcontractors are responsible for providing their own HSO on all HAZWOPER (CERCLA, RCRA) projects unless specifically exempted in the special conditions of their contract. The subcontractor's HSO shall meet the same requirements listed above in addition to having completed a 30-hr OSHA Outreach Training or equivalent as follows:

- Course 510, Occupational Safety and Health Standards for the Construction Industry.

2.2.3 Subcontractor Technical Representative

An STR may be assigned to MSCP subcontracted work by the project manager based on project needs. The STR represents MSCP, with ultimate responsibility for the safe and successful completion of

assigned project activities. The STR reports directly to the project manager. The STR manages field operations and executes the work plan, enforces site controls and documents task-site activities, and may conduct the daily prejob briefing at the start of the shift. All health and safety issues at the task site must be brought to the STR's attention. The STR also will serve as the primary area warden during the project. STRs that support MSCP shall report directly to the MSCP STR/field project manager.

Persons acting as STR on the project site must meet all STR training requirements identified in the STR qualification. The identity of the acting STR will be conveyed to project personnel, recorded in the daily logbook, and communicated to the operations manager. The STR may have numerous projects and will remain available through cellular communications when not on the project site. The STR may act as the FTL, provided they possess the proper training and can function as the FTL according to Section 2.2.1.

If the nature of the fieldwork requires involvement of field team staffing by equipment operators, laborers, or other crafts, a representative from the organization supplying these additional resources interfaces with the STR to provide work supervision. This person may be designated as the job site supervisor (JSS).

2.2.4 Regulatory Compliance

The regulatory support representative oversees, monitors, and advises the project manager and project engineer on environmental issues and concerns regarding task-site activities, and reports to the project manager. The regulatory support person is responsible for:

- Ensuring compliance with DOE orders, Environmental Protection Agency regulations, and other regulations concerning the effects of task-site activities on the environment
- Providing surveillance support for hazardous waste storage and transport
- Assisting the project engineer in completing the hazards profile screening checklist.

2.2.5 Quality

The quality assigned individual provides guidance on task-site quality issues, when requested, and is responsible for:

- Observing task-site activities and verifying that task sites comply with quality requirements pertaining to these activities
- Identifying activities that do not or potentially will not comply with quality requirements and suggesting corrective actions.

2.2.6 Radiological Engineer

The assigned radiological engineer is the primary source for information and guidance relative to the evaluation and control of radioactive hazards. If a radiological hazard exists or occurs at a project site, the radiological engineer makes recommendations to minimize health and safety risks to site personnel through the project manager and radiological control technician. Responsibilities of the radiological engineer include

- Performing radiation-exposure estimates and as low as reasonably achievable (ALARA) evaluations
- Identifying the type(s) of radiological monitoring equipment necessary for the work
- Advising the HSO and radiological control technician (RCT) of changes in monitoring or PPE
- Advising personnel on site evacuation and reentry.

The radiological engineer may also have other duties to perform as specified in other sections of this Plan or in accordance with Companywide *Manual 15B - Radiation Protection Procedures*.

2.2.7 Radiological Control Technician

The assigned RCT is the primary source for information and guidance on radiological hazards that may be encountered during project activities and controls necessary to mitigate them. Responsibilities of the RCT include:

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

The assigned RCT must notify the MSCP FTL/STR and HSO of any radiological occurrence that must be reported, as directed by PRD-183, “Radiological Control Manual.”

2.2.8 Sampling Team/Specialty Subcontractor

The sampling team, if appointed, will consist of the FTL and support personnel and is responsible for the collecting, preserving, and shipping all monitoring samples in accordance with the applicable field sampling plan or other relevant documents. The HSO will support the sampling team, as required, based on site-specific hazards and task evolutions. The sampling team will be led by a sampling FTL.

Specialty subcontractors may be used to support equipment maintenance or waste stream characterization, handling, and shipping. A subcontractor lead (subcontractor job site supervisor) will serve as the single point of contact for all subcontractor communication at the site and will report to the FTL or STR for all technical direction and interface issues at the project site. Subcontractor personnel will report any health and safety issues that arise to the HSO and FTL or STR who may step-back or stop work if an unsafe condition exists. The subcontractor lead will also be asked to provide hazard identification and mitigation information about the nature of their equipment or operations during the prejob briefing meeting, and will participate in job-site hazard walk-downs where appropriate.

2.2.9 Field Team Personnel

All field team personnel, including facility and subcontractor support personnel assigned to the project, will understand and comply with the requirements of this Plan. The FTL or STR (or designee) may conduct a formal prejob briefing at the start of each project and as described in MCP-3003, “Performing Pre-Job Briefings and Documenting Feedback.” During the prejob briefing, all daily activities, associated hazards, hazard mitigation (e.g., engineering and administrative controls, required

PPE, and work control documents), and emergency conditions and actions will be discussed. Input from the project HSO, and RCT (where assigned) will be provided to clarify task health and safety requirements. All project personnel are encouraged to ask questions about site activities and provide suggestions on ways to perform required activities in a more safe and effective manner based on the lessons learned from previous similar activities.

Once at the project site, field team personnel are responsible for identifying potentially unsafe situations or conditions to the HSO and FTL or STR with associated corrective action.

NOTE: *If it is perceived that an unsafe condition poses an imminent danger, site personnel are encouraged and authorized to step back/stop work immediately and notify the HSO and FTL or STR of the unsafe condition.*

2.2.10 Occasional Workers

All people who may be at a project site and are not part of the field team (e.g., surveyors or others not assigned a field team support role) are considered occasional workers. A person will be considered onsite when they are present beyond the support zone, in the designated work areas, or in the controlled work areas.

Occasional workers, in accordance with the HAZWOPER standard, must receive site-specific training in addition to 24-hr HAZWOPER training, and required training outlined in Table 6-1 at a minimum, before entering HAZWOPER controlled work areas at the project site. A project 40-hr HAZWOPER trained supervisor must supervise occasional workers who have not completed three days of supervised field experience in accordance with the HAZWOPER standard.

2.2.11 Visitors

All visitors with official business at the project (including ICP personnel, representatives of DOE, and state or federal regulatory agencies) may only proceed beyond the support zone after meeting the following requirements:

- Receive site-specific training or hazard briefing based on specific activities and/or the potential for exposure to project hazards
- Sign a training roster for the briefing on PLN-2128 and provide proof of having met all training requirements specified in Section 6 (or required access training for the area to be visited when project activities are not being conducted and there is no potential for exposure to safety and health hazards).
- Participate in a pre-job briefing in accordance with MCP-3003.

If the HSO determines there is no potential for exposure to chemical, radiological, or safety hazards outside controlled work areas, a visitor may be escorted outside the controlled work area after receiving a site orientation consisting of the following:

- Overview of the controlled areas at the site and access restrictions
- Potential general site hazards and mitigation
- Required PPE for entry to the site (must be trained to wear required PPE)

- Emergency action to take in case of a take-cover or evacuation alarm.

NOTE: *Visitors will not be allowed into controlled work areas (even with proper training) during high hazard activity, such as active soil removal activities and hoisting operations, to minimize the risk of injury or exposure. The determination as to any visitor's need for access into the controlled work areas during such activities will be made by the HSO in consultation with the project RCT as appropriate.*

A fully-trained, project representative (e.g., FTL, STR, or HSO, or a designated alternate) will escort visitors when entering uncontrolled areas of the project site, as site conditions warrant, and as deemed appropriate by the HSO and/or RCT.

A casual visitor to the task site is a person who does not have a specific task to perform or other official business to conduct at the project site and will not be permitted in work zones or designated work areas at any project site.

2.2.12 Job-Site Supervisor/Foreman

The JSS/foreman is the field supervisor for personnel assigned to work at the project site. The JSS/foreman and MSCP STR/FTL work as a team to accomplish daily operations at the project, identify and obtain additional resources needed to complete work, and interact with his subcontract HSO and assigned RCT on matters regarding health and safety. The STR and/or FTL, must be immediately informed about any health and safety issues that arise at the project and may take a step back or initiate a step back/stop work if an unsafe condition exists. The JSS/foreman will provide information to the STR/FTL, and HSO regarding the nature of their work for input at the daily pre-job briefing.

2.2.13 Subcontractor Job-Site Supervisor/Foreman

The subcontractor is responsible for being the job-site supervisior and HSO for all subcontracted projects under the MSCP unless specifically addressed in the contract special conditions. MSCP assigned HSO will act in an oversight role when work is subcontracted unless specifically addressed in the contract special conditions. Section 2.2.12 of this document describes the roles and responsibilities of the job-site supervisor/foreman; and Section 2.2.2 identifies the roles, responsibilities, and training requirements of the HSO. Per Section 2.2.1 of this document, the project manager will define the level of HSO coverage based on project risk and complexity.

3. HAZARD IDENTIFICATION AND MITIGATION

The overall objective of this section is to identify the basic set of existing and anticipated hazards based on the CERCLA, long-term stewardship, VCO, and/or RCRA closure scope of work and to provide controls to eliminate or mitigate these hazards. The identified hazards and mitigations in this section are the basic hazards to be encountered in MSCP work activities selected through the completion of a hazard profile screening checklist. Additional hazard identification and mitigation not included in this document are addressed in the work control document(s) for the work activity. This document does not contain hazard identification and hazard mitigation for all hazards to be encountered while conducting MSCP activities.

This section describes the chemical, radiological, safety, and environmental hazards that personnel may encounter while conducting project activities. Hazard mitigation provided in this section and in combination with other work controls, when necessary, may also be used, where applicable, to eliminate or mitigate project hazards. The magnitude of danger presented by these hazards to personnel entering work zones depends on both the nature of the activities being performed and the proximity of personnel to the hazards. Engineering controls will be implemented (whenever possible) along with administrative controls, work practices, and personal protective equipment (PPE) to further mitigate potential exposures and hazards.

3.1 ICP Integrated Work Control Process

Each project will generate its own hazard profile screening checklist through the integrated work control process and may create additional work control documents including a job safety analysis (JSA) and work permits to complete their hazard mitigation process. The hazard profile screening checklist (Form 430.10) is normally generated through the STD-101, “Integrated Work Control Process” or the Hazard Evaluation Group established under the MSCP through the Hazard Identification and Mitigation System in accordance with MCP-3562, “Hazard Identification Analysis and Control of Operational Activities.” This hazard profile screening checklist will identify the hazards and reviewers for mitigating hazards from project activities identified at the specific project level. The Hazard Identification and Mitigation System guide generated from the hazard profile screening checklist serves as the hazard identification and mitigation guide for the project specific work scope and will be utilized to populate the Job Safety for use under MCP-3562 and STD-101 work control procedures, as appropriate. The MSCP work control process is identified in PLN-2087.

3.2 Chemical and Radiological Hazards and Mitigation

Personnel could be exposed to chemical and radiological hazards while working at CERCLA and/or RCRA closure task sites. Project-specific contaminants will be documented in job-specific work control documentation. Mitigation strategies for specific work activities are found in job-specific work control documentation (e.g., STD-101 work order, JSAs, technical procedures, exposure assessments, and radiological work permits [RWPs]).

3.2.1 Routes of Exposure

Exposure pathways exist for hazardous materials and radionuclides at CERCLA and/or RCRA closure project sites. Engineering controls, monitoring, training, and work controls will mitigate potential

contact and uptake of these hazards; however, the potential for exposure to contaminants still exists. Exposure pathways include those listed below:

- **Inhalation** of volatile organic compounds, fine metals, dust, fumes, vapors, asbestos, and radionuclides is possible while handling contaminated media. Inhalation of contaminants can result in adverse effects. In most cases, contaminant concentrations are not adequate to pose an inhalation hazard; however, precautions may be required to avoid inhalation of contaminants during specific work activities. These precautions will be covered in an appropriate work control document (e.g., JSA, technical procedure, STD-101, or work order).

- **Skin absorption and contact** with contaminants (including acids, caustics, mercury, and other chemicals) are possible while handling contaminated media at CERCLA and/or RCRA closure project sites. Skin absorption of these materials can result in adverse affects (e.g., vertigo, vision disturbance, tremors, nausea, and vomiting). Precautions and use of appropriate PPE are required to avoid skin absorption of the contaminants present in the materials encountered by project workers.

- **Ingestion** of volatile organic compounds, metals, polychlorinated biphenyls, and radionuclides is possible during CERCLA and/or RCRA closure work. Personnel shall not eat, drink, chew gum or tobacco, smoke, apply cosmetics, or perform any other practice that increases the probability of hand-to-mouth transfer of materials in any undesignated areas. Personnel shall wash hands and face after work is completed. As noted in Table 2-2, some chemicals are possible human carcinogens based on the results of animal studies. In addition, several of the radionuclides present at CERCLA and/or RCRA closure project sites are known human carcinogens. Respiratory protection required for specific jobs will be determined in consultation with the HSO, IH, and radiological engineer.

- **Injection** while handling contaminated media at project sites by breaking of the skin or migration through an existing wound can result in localized irritation, contamination, uptake of soluble contaminants, and deposition of insoluble contaminants.

- **Direct exposure** to ionizing radiation while handling radiologically contaminated or irradiated items could result in personnel receiving a radiological dose.

Chemical and radiological hazards will be eliminated, isolated, or mitigated to the extent possible during all project activities. Where they cannot be eliminated or isolated, monitoring for chemical and radiological hazards will be conducted (as described in Section 1) to detect and quantify exposures. In addition, administrative controls, training, work procedures, and protective equipment will be used to further reduce the likelihood of exposure to these hazards in accordance with MCP-153, “Industrial Hygiene Exposure Assessment.”

The project-specific work control documentation (STD-101 work order, MCP-3562, JSAs, procedures/plans, exposure assessments, and/or RWPs) will be used in conjunction with this Plan to address specific hazardous and radiological conditions at the individual project sites. If used, these documents will further detail specialized PPE and dosimeter requirements.

3.3 MSCP Potential Hazards and Mitigation

All potential hazards and mitigation actions for MSCP work scope will be evaluated per the ICP Integrated Work Control Process including STD-101 or MCP-3562. Additional work scope and/or

hazards will be identified as part of a job-specific JSA and/or other applicable work control documents/permits. The following sections outline general hazard identification, evaluation, and control strategies.

3.3.1 Ultraviolet Light Exposure

Personnel exposed to UV (i.e., sunlight) while conducting project activities are reminded to protect themselves from sunlight. Sunlight is the main source of UV known to damage the skin and potentially cause skin cancer. The amount of UV exposure depends on the strength of the light, the duration of exposure, and the level of skin protection. Since UV rays present a potential hazard, the following mitigative actions are recommended to minimize UV exposure:

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

3.3.2 Inclement Weather Conditions

When inclement or adverse weather conditions develop that may pose a threat to people or property at the project site (e.g., sustained strong winds 25 mph or greater with gusts at or in excess of 35 mph, electrical storms, heavy precipitation, or extreme heat or cold), conditions will be evaluated and a decision made by the HSO with input from other personnel to halt work, employ compensatory measures, or proceed. The subcontractor, FTL, and HSO will comply with ICP management control procedures and facility work control documents that specify limits for inclement weather.

The effects of wind may increase the risks associated with any given work activity. The potential effects of wind should be considered to determine if work should proceed. This includes sustained and/or gusting winds. The following summarizes the requirements for conducting work in windy conditions.

The following activities shall be discontinued when sustained winds meet the cited threshold:

Activity	Wind Speed (mph)
Roof sheeting	20
Use of a man-basket (from a crane)	20

The following activities shall be evaluated for the continued safe performance of work when sustained winds meet the cited threshold:

Activity	Wind Speed (mph)
Elevated work on power lines	25
General working at heights/scaffolding	30
Material handling	30
Hoisting and rigging	25
Aerial lift activities	25

For the use of any cranes or other similar equipment that may be affected by the wind, the manufacturer's specific criteria for use of the equipment under windy conditions are expected to be followed.

The wind speed should be the maximum wind speed measured in the immediate area of the work activity. If a job area measurement cannot be taken, a wind speed obtained from a facility monitor or from a National Oceanographic and Atmospheric Administration station for the site can be used.

The activity may need to be stopped at lower wind speeds than those presented above, depending on an evaluation conducted by the responsible job supervisor and/or industrial safety engineer. Their evaluation would consider such factors as blowing dust and debris, the type of material being handled, working at heights, and potential hazards to other workers in the area. Allowing work to continue should be based on whether additional precautions are necessary and can be implemented to protect employees from the hazardous effects of the wind.

3.3.3 Noise

Personnel working at the task site may be exposed to noise levels that exceed 85 decibels (dBA) for an 8-hr time weighted average (TWA), 84 dBA for 10-hr TWA, and 83.2 dBA for 12-hr TWA. The effects of high sound levels (noise) may include the following:

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

Noise measurements will be performed by a trained professional per the applicable company polices and procedures to determine if personnel assigned to the jobs identified are above allowable noise exposure levels. A threshold–limit value of 85 dBA (TWA) will be applied to personnel exposed to noise levels over no more than an 8-hr day. This level is based on a 16-hr recovery period in a low noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, then the threshold limit value will be adjusted to a lower value. The project IH must be consulted regarding extended work periods. The threshold limit value of 85 dBA TWA for an 8-hr shift will change to 84 dBA TWA for a 10-hr shift and to an 83.2 dBA TWA for at 12-hr shift.

Personnel whose noise exposure meets or exceeds the allowable level will be enrolled in the INL Occupational Medical Program or subcontractor Hearing Conservation Program. Personnel working on jobs that have noise exposures greater than 85 dBA (or equivalent for adjusted 10- and 12-hr work shifts), will be required to wear hearing protection until noise levels have been evaluated and will continue to wear the hearing protection specified by the IH until directed otherwise. Individuals having experienced a permanent threshold shift should wear hearing protection at noise levels of 80 dBA or greater.

3.3.4 Illumination

Work in low-light conditions will require supplemental lighting in compliance with 29 CFR 1926.56.

3.3.5 Fire, Explosion, and Reactive Materials Hazards

Fire, explosion, and reactive materials hazards at the task sites include potential explosive atmospheres, combustible materials near ignition sources (hot motor or exhaust system), transfer and storage of flammable or combustible liquids in the support zone, and chemical reaction (reduction, oxidation, exothermic) from incompatible waste materials. The number, type, rating, and placement of portable fire extinguishers will be evaluated for the project or work location based on fire risk. They will be located in all active work areas, on or near site equipment with exhaust heat sources, and on or near all equipment that is capable of generating ignition or that has the potential to spark. Field team members will receive fire extinguisher or fire watch training as listed in Section 6, Table 6-1, of this Plan.

3.3.6 Biological Hazards

Contaminated soils removal sites are located in an area that provides habitat for various rodents, insects, and reptiles. Based on biological studies done at the INL, deer mice have been known to carry the hantavirus. The virus is present in the nesting and fecal matter of deer mice. A potential exists for project personnel to disturb nesting or fecal matter during the course of mobilization and intrusive activities. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Also, contact and improper removal of these materials may provide additional inhalation exposure risks.

If suspect rodent nesting or excrement material is encountered, the STR, IH, and HSO will be notified immediately and no attempt shall be made to remove or clean the area. Following an evaluation of the area, a safe work permit (SWP) will be written for disinfecting and removal of such from the project task area. The IH will provide the necessary guidance for protective equipment, mixing and application of the disinfecting solution (bleach solution), and proper disposal method of the waste. Typical PPE for disinfecting and removal of a large nesting area may include full-face respirator with a high-efficiency particulate air (HEPA) filter cartridge, Tyvek[c] coveralls, outer booties, and two pair of gloves (latex inner-nitrile outer). Generally, all seams and mating/overlapping PPE ensemble pieces will be taped.

c. References herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U.S. Government, any agency thereof, or any company affiliated with the Idaho National Laboratory.

Snakes, insects, and arachnids (for example, spiders, ticks, and mosquitoes) may also be encountered. Common areas to avoid include material stacking/staging areas, under existing structures (e.g., trailers and buildings), under boxes, and other areas that provide shelter for snakes. Protective clothing will prevent insects from direct contact with personnel; however, repellant (DEET or equivalent) may be required during Level D activities.

3.3.7 Safety Hazards

Industrial safety hazards pose a significant, if not the most likely, threat to personnel that will be encountered while performing activities. General safe-work practices must be followed at all times specific to industrial safety hazards and procedures to eliminate or minimize potential hazards to project personnel.

3.3.7.1 Heavy Equipment and Moving Machinery. The hazards associated with the operation of heavy equipment include injury to personnel, equipment damage, and/or property damage. All heavy equipment will be operated in the manner in which it was intended and according to manufacturer's instructions. Only authorized personnel will be allowed in the vicinity of operating heavy equipment and should maintain visual communication with the operator. Work-site personnel will comply with MCP-2745, "Heavy Industrial Vehicles"; PRD-5123, "Motor Vehicle Safety"; and 29 CFR 1910.178, "Powered industrial trucks." Site personnel working around or near heavy equipment and other moving machinery will comply with PRD-600, "Maintenance Management Requirements"; and DOE-STD-1090-2004, "Hoisting and Rigging," as applicable and appropriate.

Additional safe practices will include the following:

- All heavy equipment will have backup alarms.
- Walking directly in back of or to the side of heavy equipment without the operator's knowledge will be prohibited. All precautions will have been taken prior to moving heavy equipment.
- While operating heavy equipment in the work area, the equipment operator shall maintain communication with a designated person responsible for providing direct voice contact or approved standard hand signals. In addition, all site personnel in the immediate work area shall be made aware of the equipment operations.
- All equipment shall be kept out of traffic lanes and access ways and shall be stored so as not to endanger personnel at any time.

3.3.7.2 Excavation and Trench Areas. The excavation will be protected by a perimeter barrier to preclude falls into the excavation or trench, where applicable. No one shall enter the trench/excavation until it is evaluated as a confined space and proper shoring/sloping or protective means provided and deemed safe to enter by an excavation competent person daily. Excavations shall be monitored and controlled in accordance with Manual 14A, *Safety and Health–Occupational Safety and Fire Protection*, and PRD-22, "Excavation and Surface Penetration."

3.3.7.3 Electrical Hazards/Energized Systems. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. If work on energized systems is necessary, these practices will conform with the requirements in Company Manual 14A; PRD-5099, "Electrical Safety"; PRD-2011, "Electrical Safety"; Company Manual 9,

Operations; MCP-3651, "Chapter IX-Level II Lockouts and Tagouts"; PRD-2012, "Lockouts and Tagouts"; facility supplemental MCPs; and Parts I through III of National Fire Protection Association 70E. In addition, all electrical work will be reviewed and completed under the appropriate work controls (i.e., PLN, SWPs, and work control documents).

Before beginning any subsurface penetrations, underground utility clearances will be obtained by contacting telecommunications (526-1688 or 526-2512). Subsurface investigation clearance will be obtained in accordance with Company Manual 6, *Maintenance*; MCP-1388, "Subsurface Investigations, Excavations, and Surface Penetrations"; and PRD-22, "Subsurface Investigations, Excavations, and Surface Penetrations."

3.3.7.4 Dust Control. Wells may be drilled in potentially radiologically contaminated soil. Dust control is imperative to maintain radiological inhalation exposures well below established limits. Eliminating the potential for dust generation through good work practices such as wetting the soil is the most effective way of eliminating the potential exposure to dust. Additional controls may include an enclosure or some other means devised to control dust.

Additional controls may include the use of a tent or climate control enclosure under slight negative pressure covering the dust-generating operation to eliminate potential dust exposure. The project is responsible for the control of dust during dust generating activities.

3.4 Other Site Hazards

Site personnel should continually look for potential hazards and immediately inform the STR or HSO of the hazards so that action can be taken to correct the condition.

The STR, HSO, RCT, and JSS will conduct daily inspections of the project to ensure barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the sites. These inspections may be noted in the FTL, STR, or sample logbook, as applicable. Health and safety engineers present at the project may, at any time, recommend changes in work habits to the FTL or STR. However, all changes that may affect radionuclide-contaminated soils removal project written work control documents (PLAN, RWPs, SWPs) must have concurrence from the appropriate project technical discipline representative onsite and a data analysis report prepared as required.

Personnel working at the project are responsible to use safe-work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job.

3.4.1 Material Handling and Back Strain

Material handling and maneuvering of various pieces of equipment may result in employee injury. All lifting and material-handling activities will be performed in accordance with applicable company policies and procedures. Personnel will not physically lift objects weighing more than 22 kg (50 lb) or 33% of their body weight (whichever is less) alone.

Additionally, back strain and ergonomic considerations must be given to material handling and equipment usage. Mechanical and hydraulic lifting devices should be used to move materials whenever possible. The IH will conduct ergonomic evaluations of various project activities to determine the

potential ergonomic hazards and provide recommendations to mitigate these hazards. Applicable requirements from company policies and procedures will be followed.

3.4.2 Working and Walking Surfaces

Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, slips, and falls. The various work surfaces associated with drilling and sampling activities present inherent tripping hazards because of uneven ground, equipment in use, and metal working surfaces. Additionally, the potential for slip, trip, and fall hazards will increase during winter months because of ice- and snow-covered surfaces combined with objects beneath the snow. During the prejob briefing, all personnel will be made aware of tripping hazards that cannot be eliminated. Tripping and slip hazards will be evaluated during the course of the project in accordance with applicable company policies and procedures.

3.4.3 Pressurized Systems

Drilling equipment operated on this project utilizes high-pressure air and hydraulic systems. The hazards presented to personnel, equipment, facilities or the environment because of inadequately designed or improperly operated pressure systems include blast effects, shrapnel, fluid jets, release of toxic or asphyxiant materials, contamination, equipment damage, personnel injury, and death. These systems can include pneumatic, hydraulic, or compressed gas systems. The requirements of applicable company policies and procedures, and the manufacturer's operating and maintenance instructions must be followed. This includes inspection, maintenance, and testing of systems and components in conformance with American National Standards Institute (ANSI) and Compressed Gas Association.

All pressure systems will be operated in the designed operating pressure range, which is typically 10 to 20 % less than the maximum allowable working pressure. Additionally, all hoses, fittings, lines, gauges, and system components will be rated for the system for at least the maximum allowable working pressure (generally the relief set point). All high-pressure air lines and fittings shall be provided with whip checks at connection points to prevent lines from whipping in the event of failure. The project HSO should be consulted about any questions of pressure systems in use at the project site.

3.4.4 Welding, Cutting, or Grinding

Personnel conducting welding, cutting, or grinding activities may be exposed to molten metal, slag, and flying debris. In addition, a fire potential exists if combustible materials are not cleared from the work area. Requirements from PRD-2010, "Welding, Cutting, and Other Hot Work"; or PRD-5110, "Weld Record Packages and Piping Testing Packages," will be followed whenever these types of activities are conducted. Completion of Form 440.06, "Welding, Cutting, Other Hot Work Area Permit," or equivalent Form 442.01, "Safe Work Permit-I," and/or Form 442.01a, "Safe Work Permit-II," is required prior to performing hot work.

3.5 Drilling Hazards

Air rotary drilling (or equivalent) is normally utilized at the INL in contamination areas to obtain required depths. Drilling personnel must remain aware of potential drilling equipment hazards and body positioning during all material handling activities. Specific hazards associated with drill rigs are described below. Additional hazards and mitigation information is described in the project well drilling and

sampling JSA which must be followed by people conducting drilling, monitoring, and sampling activities under this Plan.

Drill rig and well maintenance activities shall be conducted in compliance all associated PRDs identified on Form 540.10, "Subcontractor Requirements Manual (SRM) Applicability."

3.5.1 Slips

Slips are toothed wedges positioned between the drill pipe and the drill which suspend the drill string in the well bore when it is not supported by the hoist. Most accidents associated with slip operation are related to manual material handling; strained backs and shoulder strain.

3.5.2 Material Handling

The most common type of accident that occurs during material handling is when a load is being handled and a finger or toe is caught between two objects. Rolling stock can shift or fall from a pipe rack or truck bed. Fingers and hands can be caught between sampling barrels, breakout vices, and tools.

3.5.3 High-Pressure Lines

A high-pressure diversion system will be used to carry cuttings away from the borehole. All high-pressure lines will be equipped with positive locking connectors (e.g., cams) and be secured with properly rated whip checks in case of a connection failure. The project safety engineer will be consulted about the rating and proper placements of whip checks or equivalent restraining devices.

3.5.4 Overhead Objects

Personnel may be exposed to falling overhead objects, debris, or equipment or impact hazards during the course of the project from drilling and well installation activities. Sources for these hazards will be identified and mitigated in accordance with applicable company policies and procedures. In the case of overhead impact hazards, protective systems will be used where there is a potential for falling debris, in combination with head protection PPE.

3.5.5 Rotating Equipment

The drill stem rotates on a drill rig and remains unguarded during drill operations. Personnel working on or adjacent to the drill stem must remain aware of the rotating shaft and continuously be aware of its presence. Driller helpers shall ensure they wear no loose clothing that could become caught in rotating equipment. Personnel shall keep extremities from being caught between rotating equipment and adjacent stationary equipment.

3.5.6 Boreholes

All unattended boreholes shall be adequately covered or protected to prevent personnel from falling or slipping into hole. Cover/guard well openings and boreholes prior to moving drill rig, service rig, or boom truck if possible. Personnel working adjacent to open boreholes in excess of 12 in. shall use effective means of barricading or guarding to prevent personnel from falling into the hole.

3.5.7 Ascending/Descending Ladder

All rig steps, ladders, stairways, platforms, and walkways shall be free of mud, snow, ice, tools, and other materials that may cause slipping or tripping. When performing drill rig repair or maintenance, subcontract personnel may use permanent ladders attached to equipment or portable extension ladders placed on level footing and secured to prevent accidental dislodgement. All ladders shall be inspected prior to use to ensure they are in proper working condition and unsafe conditions, such as ice or slippery conditions, are not present. Portable ladders shall extend a minimum of 36 in. above the access level and be secured near the top for safe access/egress. Fixed ladders shall be accessed once inspected to ensure they are in good working condition, that is, free of slipping hazards and defects. Personnel accessing fixed ladders shall be afforded fall protection at or above 6 ft from the adjacent level and shall maintain three-point contact minimally at all times. Materials will be raised or lowered by use of rope or other approved methods. Employee training shall address the following subjects as applicable:

- Fall hazards in the work area
- Correct procedures for erecting, maintaining, and disassembling the fall protection system to be used
- Proper construction, use, placement, and care in handling ladders
- Maximum load-carrying capacities of ladders used
- Standards governing ladder use.

3.5.8 Wind Loading on the Drill Rig Mast

The HSO will consult with the safety engineer to determine whether wind loading on the drill rig poses a potential safety hazard. The drill rig manufacturer design specifications and ANSI and American Petroleum Institute Specification 4F, “Specification for Drilling and Well Servicing Structures,” (API 1995) will be used as the basis for determining safe design loading and limitations.

3.6 Direct-Push Probe Installation

Probes may be installed using a hydraulically powered, direct-push probing rig to advance hollow probe casing from the land surface to the sediment/basalt. If proposed boring locations are changed because of information obtained in the field, all required excavation clearances must be obtained prior to commencing the boring. The major hazards associated with this work include high noise and manual material handling with potential for struck-by/caught between pinch points. Personnel are to use a double set of hearing protection based on past noise sampling results; use good lifting principals by avoid twisting and bending, and maintaining the load close to their body; and keep their fingers and hands from being positioned between moving and stationary objects.

3.7 Hand-Augering

Some boreholes may be hand-augered to avoid any damage to underground utilities.

3.8 Hoisting and Rigging of Equipment

All hoisting and rigging of the materials will be performed in accordance with applicable company policies and procedures and DOE-STD-1090-2004, "Hoisting and Rigging," as applicable for this project. Hoisting and rigging equipment will show evidence of a current inspection (e.g., tag) and be inspected before use by qualified personnel. Additionally, the operator or designated person for mobile cranes or boom trucks will perform a visual inspection each day or before use (if the crane has not been in regular service) of items such as, but not limited to, the following:

- All control mechanisms for maladjustment that would interfere with proper operation
- Crane hooks and latches for deformation, cracks, and wear
- Hydraulic systems for proper oil level
- Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for leakage
- Hoist ropes for kinking, crushing, bird-caging, and corrosion
- All anti-two-block, two-block warning, and two-block damage prevention systems for proper operation
- Administrative control procedures developed by the INTEC facility shall be followed for applicable hoisting and rigging activities.

NOTE: *The operator or other designated person will examine deficiencies and determine whether they constitute a safety hazard.. If deficiencies are found, they will be reported to the HSO.*

4. ACCIDENT AND EXPOSURE PREVENTION

MSCP personnel are exposed to potential safety, physical, chemical, and radiological hazards. Therefore, it is critical all personnel understand and follow the requirements of this document. Engineering controls, hazard isolation, specialized work practices, and the use of PPE will be implemented to eliminate or mitigate all potential hazards and exposures where feasible. However, all personnel are responsible for identification and control of project hazards associated with their work scope in accordance with ISMS principles and practices. Hazards shall not be left unmitigated without implementing some manner of controls or abatement (e.g., engineering controls, administrative controls, or the use of PPE). Project personnel should use step back/stop work authority in accordance with applicable company policies and procedures where it is perceived that imminent danger to personnel, equipment, or the environment exists.

4.1 Voluntary Protection Program and Integrated Safety Management

The ICP safety processes embrace the VPP and ISMS criteria, principles, and concepts to identify and mitigate hazards, thereby preventing accidents. All management and workers are responsible for implementing safety policies and programs and for maintaining a safe and healthful work environment. Project personnel will 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 ICP intranet. CWI and all its' subcontractors participate in VPP and ISMS. This document includes all elements of both systems.

The five key elements of VPP and ISMS and their corresponding sections in this document are listed in Table 4-1.

Table 4-1. Five key elements of the Voluntary Protection Program and the Integrated Safety Management System and corresponding sections of this document.

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

There are eight guiding principles for ISMS. These principles, combined with the core functions are the fundamental concepts. The eight guiding principles of ISMS are:

1. **Line Management Responsibility for Safety**. Line management is responsible for the safe and efficient conduct of work to ensure the protection of the public, the workers, and the environment.

2. **Clear Roles and Responsibilities**. Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels.

3. **Competence Commensurate with Responsibilities**. Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

4. **Balanced Priorities**. Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and executed.

5. **Identification of Safety Standards and Requirements.** Before work is performed, the associated hazards are evaluated, and standards and requirements are established that, when properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

6. **Hazard Controls Tailored to Work Being Performed**. Administrative and engineering controls to prevent and mitigate hazards are integrated and tailored to the work and associated hazards.

7. **Operations Authorization**. The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.

8. **Worker Involvement**. Execution of the ISMS is focused where work is executed, both at the company/site level and at the facility/activity level. Line management direction and ownership, worker input and support, and effective processes must be present to ensure success of the ISMS.

4.2 General Safe Work Practices

Sections 1 and 3 of this Plan define the project scope of work and associated project-specific hazards and mitigation. The following practices are required for all project personnel to further reduce the likelihood of accidents and injuries. All visitors permitted to enter the project work areas must also follow these requirements. The project HSO will be responsible for ensuring that personnel adhere to the following safe-work practices at the project site:

- Limiting project area access to only authorized personnel in accordance with applicable company policies and procedures.

- Being aware of and complying with all safety signs, tags, barriers, and color codes as identified in applicable company policies and procedures.

- Being familiar with the physical characteristics of the project site and operational requirements, including, but not limited to the following:

    - Layout of the site, controlled areas, and egress routes

- Project contaminants, hazards, and PPE requirements
- Warning devices and alarms
- Major roads and means of access to and from the project site
- Location of facility emergency response equipment and first aid supplies.

- Being alert for dangerous situations (e.g., facility alarms, spills, accidents, and injuries) and reporting dangerous situations and near misses to the HSO. The HSO will make required notification in accordance with Section 10.

- Providing adequate information to oncoming shift personnel, including equipment and system status and inspection logs.

- Communicating about all systems, monitors, and safety components that are non-operational and ensuring they are tagged as to their appropriate status (e.g., out-of-service or do not use).

- Planning and reviewing all project activities before initiating the activity. Verifying all work control documents (e.g., the RWP, JSA, technical procedure, or work control document) are current and correct for the activity. A pre-job briefing is required to be conducted for all activities, in accordance with applicable company policies and procedures.

- Conducting all project activities in accordance with the applicable work control document. All activities will be conducted as stated in the applicable work control document including hold points and requirements for initials upon completion of certain steps) or STD-101 work control documents, as required.

NOTE: *It is the responsibility of all operations personnel to identify, understand, and follow the appropriate work controls for their operational activities.*

- Having the authority and commitment to initiate a step back/stop work action in accordance with applicable company policies and procedures.

- Being familiar with project layout, tools, and equipment for which they are responsible to operate, including operating limitations, maintenance, inspection, and manufacturer's operating instructions requirements. Using tools and equipment for their intended use only.

- Understanding the PPE requirements for all activities as stated on the applicable JSA or work control document, including proper use and limitation of all PPE. If questions arise about PPE, personnel will contact the assigned HSO or RCT as applicable.

- Wearing all required dosimetry as stated on the RWP including any supplemental dosimetry (e.g., electronic dosimeters and albedo dosimeters).

- Responding to all radiological alarms, including, but not limited to, continuous air monitors, criticality system alarms, radiation alarms, and personal contamination monitor alarms.

- Avoiding direct contact with known contaminated surfaces. Personnel shall not walk through spills or other areas of contamination and shall avoid kneeling, leaning, or sitting on equipment or surfaces that may be contaminated.

- Not eating, drinking, chewing gum or tobacco, smoking, applying cosmetics or sunscreen, or performing any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials in designated work areas.

- Practicing good housekeeping at all times, including turning in or placing tools in the designated storage location after use and putting waste materials in the appropriate waste container or receptacle. If there is a question as to where to dispose of a waste article, personnel should contact their supervisor.

4.2.1 Avoiding Chemical and Physical Hazard Exposure

NOTE: *Identification and control of exposures to carcinogens (e.g., asbestos) will be conducted in accordance with applicable company policies and procedures.*

The MSCP radiological activities may generate low-level, mixed low-level, hazardous, and Toxic Substances Control Act (15 USC § 2601 et seq., 1976) remediation waste. Most of the waste designated for ICDF disposal will be contaminated soil, but contaminated piping, debris, and PPE waste may also included in the waste inventory.

Controls will be employed during project activities 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, technical procedures and work control documents, hold points, training, and monitoring hazards will be used as appropriate to reduce exposure potential. Some methods of exposure avoidance include the following:

- 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

- Doffing PPE following standard practices (e.g., rolling outer surfaces in and down) and following doffing sequence

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

4.3 Buddy System

The two-person or buddy system will be used during MSCP activities unless specifically approved by the HSO. 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 or in immediately dangerous to life or health (IDLH) situations. 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 need to use the buddy system during MSCP activities will be determined by the HSO, and/or Radiological Control personnel and documented on the initial pre-job briefing form (Form 434.14, "Pre-Job Briefing Checklist"). Specific work control documents may also be utilized to determine the need for use of the buddy system during specific activities or all of the activities conducted under the outlined work scope.

4.4 Site Inspections

Project personnel may participate in site inspections during the work control preparation stage (such as the hazard identification and verification walk-downs) and may conduct self-assessments or other inspections. In addition, the HSO and project manager will perform periodic safety inspections in accordance with MCP-3449, "Safety and Health Inspections."

Targeted or required self-assessments may be performed during all work activities in accordance with MCP-8, "Performing Management Assessments and Management Reviews." All inspections and assessments will be documented and available for review. These inspections will be noted in the applicable FTL, STR, or sample logbook. Health and safety professionals present at the project site may, at any time, recommend changes in work habits to the HSO/FTL. However, all changes that could affect the work scope or that introduce additional hazards will result in a change to the appropriate work control documents.

4.5 Subcontractor Responsibilities

Subcontractors are expected to take a proactive role in hazard identification and mitigation while conducting project activities. Subcontractors will report unmitigated hazards to the HSO after taking protective actions (within the documented work controls) or emergency protective actions (e.g., evacuate from the area and warn others) as stated in Section 10.

5. 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 applicable company policies and procedures for visitors, employees, and subcontract employees. The project manager will make the determination as to whether a site attendance logbook is necessary prior to work commencement.

The HSO shall 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 equipment layout at the project site should reflect the nature of the hazard presented and should be mitigated through the use of engineering controls (barriers, guards, isolation); administrative controls (roped-off restricted areas or controlled entry access); and qualifications of operators and those assisting in equipment operation (when required).

Based on the nature of the project activities to be completed, a graded approach with three types of site control designations may be used based on the potential hazards, complexity of work tasks, and duration of project activities. The three types of work areas are as follows:

- Support zone.
- Contamination reduction zone, including a contamination reduction corridor. The contamination reduction corridor may not be posted, but it is the primary pathway from the contamination reduction zone to the exclusion zone).
- Exclusion zone.

The primary differences between the three areas will be the size of the area, method of delineation, and postings, as determined by the activities being conducted and associated hazards. The HSO and Radiological Control personnel (where radiological concerns exist) will determine what type of work area will be established.

Both radiological and nonradiological hazards (including industrial safety hazards) will be evaluated when establishing the initial work zone size, configuration, and location. Depending on the nature and extent of contamination, common barriers may be used to delineate both radiological and nonradiological work zone postings. 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.

Personnel not directly involved with project activities will be excluded from entering these work areas. Visitors may be admitted into work areas provided they (1) are on official business, (2) have received site-specific training or orientation by the HSO or designee, and (3) have met all the

site-specific training requirements for the area they have a demonstrated need to access (including PPE training), as described in Section 6 (and listed in Table 6-1).

NOTE: *Visitors may not be allowed into controlled work areas during certain activities to minimize risks to workers and visitors. The HSO and RCT (as appropriate) will determine any visitor's need for access into the controlled work area.*

5.1 Support Area or Zone

The support area or zone will be considered a clean (i.e., nonradiological) area. The location of the support zone should be in a prevailing upwind direction from the exclusion zone (where possible) and readily accessible from the nearest road. The support zone is a designated area or building outside the contamination reduction zone 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 support zone. Visitors lacking appropriate training to enter other project areas will be restricted to this zone.

The subcontractors' equipment laydown and storage area for the project will generally be located in the support zone if another designated area has not been established.

5.2 Controlled Work Area

The controlled work area will be large enough to encompass the equipment and nature of the project activities being conducted to prevent personnel not assigned to the project and visitors from being exposed to potential safety and health hazards associated with the project activities or other hazardous equipment operations. The boundary of the controlled work area typically will be marked with a combination of stanchions or posts and delineated with rope or ribbon and include cautions signs (e.g., CERCLA Area) or other demarcation. Only the minimum number of personnel required to safely perform the project activities will be allowed into this area. The controlled work area will be controlled at all times. Also, entry and exit points will be established to regulate the flow of personnel and equipment. All personnel who enter the controlled work area will wear the appropriate level of PPE for the hazards present.

Factors that will be considered when establishing the controlled work area boundary include (1) air monitoring data, (2) equipment in use, and (3) the physical area necessary to conduct site operations. Based on the factors listed above, the boundary may be expanded or contracted as new information becomes available. The HSO will establish the boundary. All controlled work areas will be delineated and posted with the appropriate signage based on the hazard being controlled and in accordance with applicable company policies and procedures. Controlled work areas are typically established in lieu of the contamination reduction zone and exclusion zone where controls remain the same throughout the area.

NOTE: *The HSO will establish access requirements for the truck or heavy equipment traffic routes, designated work areas, and the project-based equipment in use.*

5.3 Contamination Reduction Zone and Corridor

The contamination reduction zone and contamination reduction corridor are transition areas surrounding the exclusion zone and are located between the exclusion zone and support zone (see

Figure 5-1). The contamination reduction corridor may not be formally delineated but will be designated by the travel path from the established contamination reduction zone-controlled entry and exit point and the exclusion zone entry and exit point as contamination control warrants. The contamination reduction zone and contamination reduction corridor normally will serve to buffer the support zone from potentially contaminated exclusion zone areas. The contamination reduction zone and contamination reduction corridor may serve as staging areas for equipment and temporary rest areas for personnel.

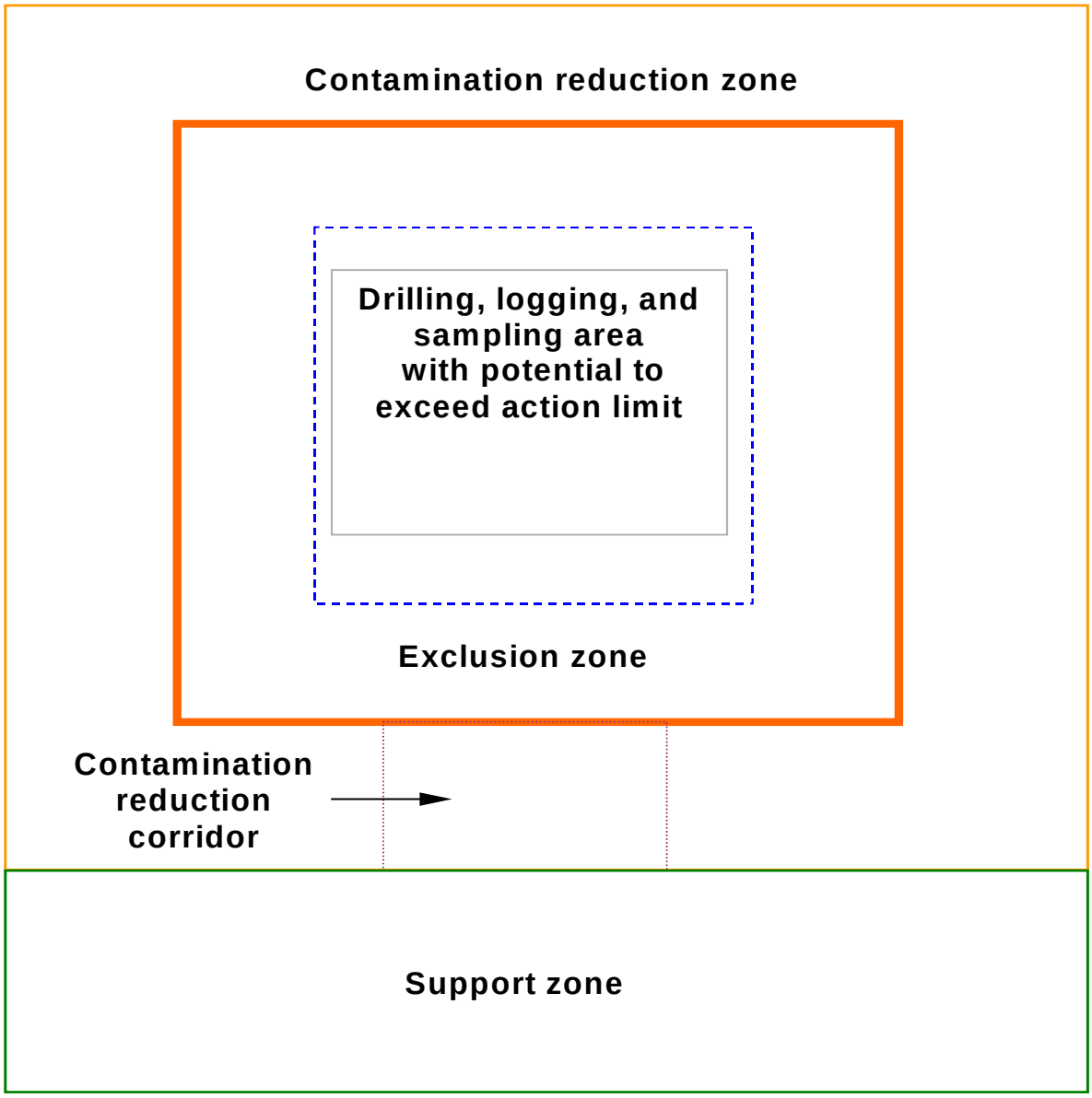


Figure 5-1. Example of established controlled work zones (exclusion zone, contamination reduction zone, and support zone).

5.4 Exclusion Zone

The exclusion zone is the area within the project site where exposure to the physical, chemical, and radiological hazards is anticipated, and access to this area is controlled to minimize personnel exposure to these hazards. The exclusion zone will be large enough to encompass the primary activities and allow equipment and personnel to move about freely and conduct necessary project activities. Only the minimum number of personnel required to safely perform project activities will be allowed in the exclusion zone. The exclusion zone will be formally delineated with a posted sign, and configured in such a manner as to restrict personnel without proper training and PPE from entering (e.g., established entry and exit points). The exclusion zone shape and size will be based on the activities being conducted, existing structures and facilities, and potential for impact to adjacent areas from project activities or contaminants.

Factors that will be considered when establishing the exclusion zone boundary include (1) activities being conducted, (2) air monitoring data, (3) radiological contamination data, (4) radiation fields, (5) equipment in use, (6) physical area necessary to conduct site operations, and (7) 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 exclusion zone will wear the appropriate level of PPE for the hazards present and have required training as listed in the project work control documents.

5.5 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 Control and Movement of Contaminated Materials”; as stated in the RWP and as directed by Radiological Control personnel.

5.6 Site Security

As described in the previous sections, all project site areas will be secured and controlled during normal work hours. During non-work hours, the general project sites located inside INL/ICP 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 project manager has the primary responsibility for ensuring that the project area is secured. The HSO and Radiological Control (as 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 training and will not cross roped areas without the proper training and authorization, regardless of whether a sign is in place.

Signs are routinely lost because of high winds and will be replaced as soon as possible the next working day following discovery.

5.7 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, a designated eating area and wash facility will be identified at each project location.

5.8 Smoking

Smoking will only be permitted in designated smoking areas and personnel will comply with all INL/ICP smoking polices, including disposing of smoking materials in the proper receptacle. The project HSO (in consultation with the designated fire protection engineer) will be the single point of contact for establishing any smoking area outside facilities and such areas may not be permitted at certain times of the year because of high or extreme fire danger.

6. PERSONNEL TRAINING

All MSCP project personnel will receive training, as specified in the applicable section of the 29 CFR 1910.120; the HAZWOPER standard; DOE, federal, and state manuals; and ICP companywide manuals as applicable. Training will be developed, conducted, and maintained in accordance with applicable company manuals and applicable facility-specific supplemental training procedures (where required). Applicable company manuals describe the companywide processes that ensure the ICP work force is properly trained to work effectively and safely and ensure that all personnel in the company understand their roles, management's role, and the role of the Training Directorate in training ICP employees.

Table 6-1 summarizes the minimum training requirements for all personnel, including functional support personnel, supporting MSCP activities. Project-specific training may be identified through a training matrix and entered into the Training Records and Information Network (TRAIN) (INEEL 2004) system prior to work commencement on MSCP projects. The training matrix can be developed and maintained as a qualified watch list on the TRAIN system. The project HSO may assist in determining training requirements. Figure 6-1 identifies the training requirements under the HAZWOPER standard for work on CERCLA/RCRA projects based upon the potential for personnel exposure.

Table 6-1. Minimum required training for access to project areas.

Required Training	Subcontract Supervisor,[l] Field Team Leader, Health and Safety Officer, Subcontract Technical Representative and Samplers	Subcontract Personnel[l] and Other Field Team Members	Access into the Designated or Controlled Work Area, Construction Area, or Contamination Reduction Zone	Access to Project Areas(Support Zone) Outside Designated or Controlled Work Area, Construction Area, or Support Zone
40-hr hazardous waste operations (HAZWOPER)[a] - operations	Yes	Yes		
24-hr HAZWOPER[b] - operations			Yes	
8-hr HAZWOPER supervisor	Yes[c]			
Project-specific health and safety plan training[d]	Yes	Yes	Yes	
Project-site orientation briefing[e]				Yes
Fire extinguisher training (or equivalent)	Yes[c]	Yes[c]		
Medic first-aid	Yes[f]	Yes[f]		
Use of Personal Protective Equipment (00TRN288)	Yes	Yes	Yes	
Hearing conservation	Yes[g]	Yes[g]	Yes[g]	
Hantavirus (SMTT0008)	Yes[h]	Yes[h]		
Heat Stress Training (00TRN606)	Yes	Yes		
Working in Hazardous Temperatures - Cold Stress[h] (SMTT0010)	Yes	Yes		
JSA training[j]	Yes	Yes	Yes	
Respirator training	Yes[i]	Yes[i]	Yes[i]	
Prejob briefings and postjob reviews (00TRN732)	Yes	Yes	Yes	
Pre-job briefing performance evaluation (00TRN754)	Yes[c]			
DOE RW II	Yes[h]	Yes[h]	Yes[h]	
Unexploded Ordinance Recognition Training (00TRN803)	Yes[k]	Yes[k]	Yes[k]	Yes[k]
INL ESHQ/ISMS/VPP Awareness (Blue or Orange Card)	Yes	Yes	Yes	Yes
Field Worker Point of Contact Training[k] (0TRN-1145)	Yes[c]			

Table 6-1. (continued).

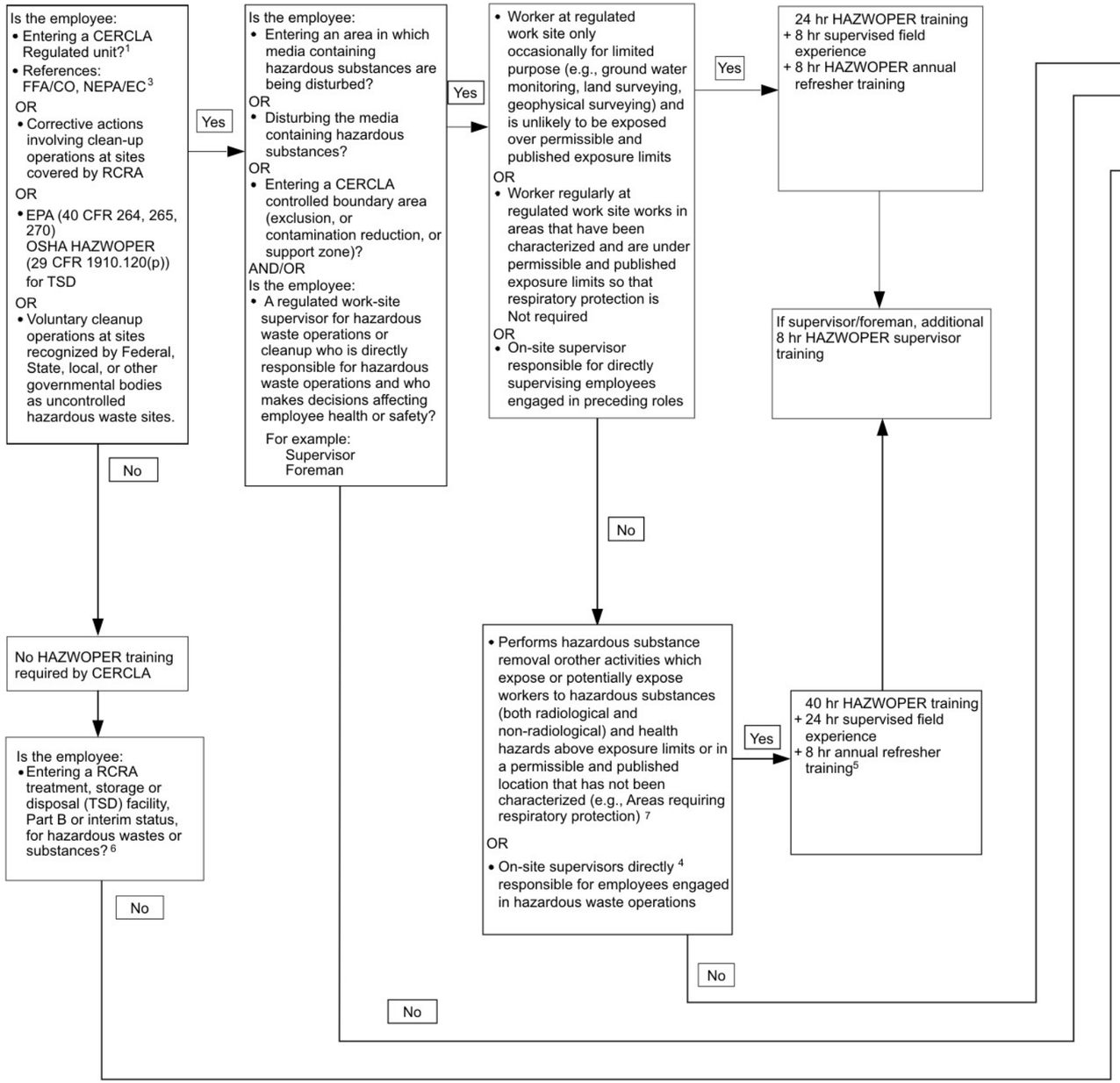
Required Training	Subcontract Supervisor,[l] Field Team Leader, Health and Safety Officer, Subcontract Technical Representative and Samplers	Subcontract Personnel[l] and Other Field Team Members	Access into the Designated or Controlled Work Area, Construction Area, or Contamination Reduction Zone	Access to Project Areas(Support Zone) Outside Designated or Controlled Work Area, Construction Area, or Support Zone

Note 1: Shaded fields indicate specific training is not required or applicable.
Note 2: Supervised field experience is only required if personnel have not previously completed this training at another CERCLA (42 USC § 9601) site (documented), or they are upgrading from 24- to 40-hr HAZWOPER training.

Note 3: Completed training project forms should be submitted to the training coordinator for inclusion in the TRAIN system within 5 working days of completion.

Note 4: A qualified watch list will be maintained electronically and available at the worksite. Evidence of training not completed on the qualified watch list will be maintained at the work site.

a. Includes 8-hr HAZWOPER refresher training as applicable, and supervised field experience as follows: 40-hr HAZWOPER = 24-hr supervised field experience and 24-hr HAZWOPER = 8-hr supervised field experience).
b. 40-hr or 24-hr HAZWOPER training requirement will be determined by the HSO based on the nature of the project activities and potential for exposure to contaminants or safety hazards.
c. At least one trained person onsite when field team is working.
d. Includes work scope activities, project-specific hazards communications (29 CFR 1910.120), site-access and security, PPE requirements, training requirements, relevant exposure monitoring, and decontamination and emergency response actions, as required by 29 CFR 1910.120(e).
e. 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 PLAN.
f. At least two trained individuals to remain onsite during field work activities outside a facility boundary.
g. If entering areas where initial exposure determination indicates exposure above the action limit is possible.
h. As required, based on project duties and/or site zone access requirements and environmental conditions.
i. Required if entering area requiring respiratory protection (e.g., action levels exceeded or the IH/RCT sampling shows respiratory protection required).
j. Includes all personnel entering the controlled work area if a JSA is necessary for the activity of project.
k. Personnel conducting field work per MCP-2725 (outside a facility boundary).
l. Or equivalent as demonstrated by subcontractor.



1 A CERCLA worker who also works on a RCRA/TSD site must also receive site-specific RCRA training and must be trained to the Health & Safety Plan (HASP) and receive orientation to the area.

2 A RCRA employee who also works on a CERCLA site will need additional training.

3 Contact Environmental Affairs Department

4 Comply with written HASP training requirements, if available.

5 16 hr upgrade needed for employees with 24 hr training, Course No. 000TRN69.

6 A RCRA employee who also works on a CERCLA site will need additional training if the CERCLA portion of the site is uncharacterized or requires use of a respirator.

7 Likely exposure indicated by:

A. Exposure to hazardous substances or health hazards which require the use of employee personal protective equipment to prevent acute, chronic, or adverse health effects (this applies to both radiological and nonradiological hazards)
OR

B. Airborne chemical exposures which meet or exceed established action levels or half the established exposure limits for chemicals which do not have assigned action levels.

Figure 6-1. Model identifying employees requiring HAZWOPER training at CERCLA/RCRA sites bases on activities performed.

Training requirement modifications (e.g., additions to or elimination of) 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 and/or RCT, as applicable, and may be listed on the project-specific training matrix without changing this document.

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., TRAIN [INEEL 2004]). Non-field 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 support locations must have received a site-specific orientation briefing

A person will be considered onsite when they are in the support zone, designated work areas, or controlled work areas. If there is no potential for exposure to chemical, radiological, or safety hazards (e.g., down time), a visitor may be escorted in the support zone after receiving a site orientation consisting of the following:

- An overview of the controlled areas at the site and access restrictions
- Potential general site hazards and mitigation
- Required PPE in the support zone (must be trained to wear required PPE)
- Emergency action to take in case of a take cover or evacuation alarm
- Evidence of meeting the minimum training requirements.

NOTE: *Visitors will not be allowed into controlled work areas (even with proper training) during active operations in order to minimize the risk of injury or exposure. The determination as to any visitor's need for access into the controlled work areas during such activities will be made by the HSO in consultation with the project RCT when radiological controls are being used.*

A fully trained project representative (e.g., FTL, STR, or HSO, or a designated alternate) will escort all visitors when they enter controlled areas of the project site, as site conditions warrant, and as deemed appropriate by the FTL, STR, or HSO.

At the time of project-specific 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 activities, associated hazards, and mitigations; and agree to follow all requirements outlined in this document and other applicable work control and safety requirements. Form 361.25 (or equivalent) training forms are available on the INL/ICP intranet under "Forms."

A trained HAZWOPER 8-hr supervisor (FTL or other person who has been trained by the HAZWOPER supervisor) will monitor the performance of each newly 24-hr or 40-hr trained worker to meet the 1 or 3 days of supervised field experience, respectively, in accordance with 29 CFR 1926.120(e). Following the supervised field experience period, the supervisor will complete Form 361.47, "Hazardous Waste Operations (HazWoper) Supervised Field Experience Verification," or equivalent, to document the supervised field experience.

NOTE 1: *Supervised field experience is only required if personnel have not previously completed and documented this training at another CERCLA (42 USC § 9601 et seq.) site or they are upgrading from 24-hr to 40-hr 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 training coordinator for inclusion in the TRAIN System within 5 working days of completion.*

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

The FTL or designee will conduct a daily planning meeting to discuss the work scope and activities to be performed. During this meeting, daily activities 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 plan of the day is not required.*

Particular emphasis will be placed on lessons learned from the previous workday's activities and how activities 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 Plan of the day will be conducted as an informal meeting and the only required record will be to document the completion of the plan of the day in the FTL or construction engineer or subcontract technical representative logbook.

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

7. EXPOSURE MONITORING AND SAMPLING

There is a potential for exposure to chemical, radiological and physical hazards during project activities and affects all project personnel conducting work activities. The mitigation strategy for these hazards includes refining work control zones (see Section 6), using engineering and administrative controls, worker training, and wearing PPE. Monitoring and sampling will be used during project activities to (1) assess the effectiveness of these controls, (2) determine the type of PPE needed for individual activities, and (3) determine the need for upgrading and downgrading of PPE as described in Section 8. Monitoring with direct-reading instruments will be conducted as deemed appropriate to provide Radiological Control and IH personnel with real-time data to assess effectiveness of these control measures.

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

- Table 7-1, "Activities and hazards to be monitored, and monitoring instrument category"
- Table 7-2, "Monitoring instrument category and description"
- Table 7-3, "Action levels and associated responses for project hazards."

7.1 Action Limits

Action limits serve as the initial limits for specific project activities where refinement of work control zones, engineering and administrative controls, worker training, and the use of protective equipment is necessary to mitigate exposures to personnel. The action limit will normally be 50 percent of the exposure limit unless otherwise specified in the work control documents. Monitoring results at or above an action limit, identified through exposure monitoring, will initiate additional evaluations including consideration for improved engineering controls, administrative controls, reevaluation of PPE, and probable need for additional exposure monitoring based on IH recommendations. Action limits may be adjusted based on changing site conditions, exposure mitigation practices, and PPE levels.

7.2 Environmental and Personnel Monitoring

Radiological Control and IH personnel will conduct initial and periodic monitoring of project activities with direct-reading instruments, collect swipes, and conduct full- and partial-period air sampling, as deemed appropriate, in accordance with the applicable company policies and procedures. As new work activities are planned or hazards are introduced, they will be evaluated and controlled in accordance with applicable company policies and procedures.

Substance-specific standard monitoring established by OSHA for asbestos, cadmium, methylene chloride, and formaldehyde will be conducted in accordance with regulatory requirements to quantify exposures based on exposure assessments and IH professional judgment. Instrumentation listed in Table 7-2 will be selected based on the site-specific conditions and contaminants associated with project activities. The RCT and IH will be responsible for determining the best monitoring technique for radiological and nonradiological contaminants (respectively) based on project site-specific conditions.

Table 7-1. Activities and hazards to be monitored and monitoring instrument category.

Activities	Hazard(s) Monitored[a]	Instrument Category Used
Soil remediation, VCO activities, Long-Term Stewardship	Ionizing radiation—(alpha, beta, gamma)	1
	Radionuclide contamination—(alpha, beta, gamma)	2
	Organic solvents (including methylene chloride and formaldehyde)	3, 4
	Metals, particulates, and fibers (including cadmium and asbestos)	3, 4
	Respirable dust—silica (area and personal)	3, 5
	Hazardous atmosphere (confined space)	6[a]
	Hazardous noise	7
	Ergonomics, repetitive motion, lifting	8
	Heat and cold stress	9

a. Optional sensors based on site-specific contaminants.

Table 7-2. Monitoring instrument category and description.

Instrument Category	Instrument Category Number Description[a]
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
	(Beta-gamma) count rate—Bicron NE/Electra (DP-6, BP-17 probes) or equivalent Stationary—Eberline RM-25 (HP-360AB probe) or equivalent
2	Continuous air monitor—ALPHA 6-A-1 (in-line and radial sample heads, pump, RS-485) or equivalent (as required) Continuous air monitor (beta)—AMS-4 (in-line and radial head, pump RS-485) or equivalent (as required) Grab sampler—SAIC H-810 or equivalent
3	Organic vapor—Direct reading instruments (photoionization detector, flame ionization detector, or infrared detector) detector tubes or grab samples
	Dust—Direct-reading instrument (miniram or equivalent)
4	Organic vapors, metals, and fibers—Personal sampling pumps with appropriate media for partial and full period sampling using NIOSH or OSHA-validated methods
5	Silica dust, respirable particulates—NIOSH 7500, NIOSH 0600 or equivalent, personal sampling pump, with cyclone, full-period sampling
6	Oxygen and LEL multi-gas instrument (MSA 361 or equivalent) with additional sensors for expected atmospheric contaminants
7	ANSI Type S2A sound level meter or Acoustical Society of America S1.25-1991 dosimeter (A-weighted scale for TWA dosimetry, C-weighted for impact dominant sound environments)
8	Observation and ergonomic assessment of activities in accordance with applicable company policies and procedures and American Conference of Governmental Industrial Hygienists threshold limit value
9	Heat stress—wet-bulb globe temperature, body weight, fluid intake
	Cold stress—ambient air temperature, wind chill charts

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

ANSI = American National Standards Institute
LEL = lower exposure limit
NIOSH = National Institute for Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
TWA = time-weighted average

Table 7-3. Action levels and associated responses for project hazards.

Contaminant or Agent Monitored	Action Level	Response Taken if Action Levels are Exceeded
Nonradiological nuisance particulates (particulates not otherwise specified)	>10 mg/m^3 (inhalable fraction) >3 mg/m^3 (respirable fraction)	1. Substitute equipment or change method to reduce emissions at source 2. Verify engineering control operation (where in place) or institute engineering controls 3. Evaluate air movement (wind) conditions and reschedule activities or reposition personnel to upwind position of source 4. Move operation to alternant location (with engineering controls if possible) 5. Use wetting or misting methods to minimize dust and particulate matter 6. IF wetting or misting methods prove ineffective, THEN don respiratory protection[a] (as directed by IH).
Nonradiological airborne contaminant (chemical, dust fume, fiber, or particulate)	Based on individual contaminant exposure limit (American Conference of Governmental Industrial Hygienists threshold limit value or OSHA permissible exposure limit) and 29 CFR 1910 or 29 CFR 1926 substance-specific requirements. Generally, sustained levels at the TL threshold limit value V or permissible exposure limit in the worker's breathing zone for 2 minutes should be used as action limit. Where ceiling values or OSHA substance-specific action limit exists, use these values.	1. Substitute equipment or change method to reduce emissions at source 2. Verify engineering control operation (where in place) or institute engineering controls 3. Evaluate air movement (wind) conditions reschedule activities or reposition personnel to upwind position of source 4. Move operation to alternant location (with engineering controls if possible) 5. IF engineering and administrative controls do not control contaminant below action or exposure limit, THEN reevaluate engineering and administrative controls or don respiratory protection[a] (as directed by IH) 6. IF OSHA substance-specific standard action limit is exceeded, THEN initiate applicable medical surveillance requirements.

Table 7-3. (continued).

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

Table 7-3. (continued).

Contaminant or Agent Monitored	Action Level	Response Taken if Action Levels are Exceeded
Airborne radioactivity (area or within the confined space)	As defined by applicable company policies and procedures. Concentrations ($\mu Ci/cm^3$) >30% of and derived air concentration value (10 CFR 835.603[d])	1. Eliminate airborne radioactivity source through use of engineering controls and removable contamination lockdown spray. 2. Reschedule operations when area or space following contamination lockdown spray application. 3. Evaluate space or area to be entered. IF the operation can be conducted outside the area or space, THEN perform operation without entry. 4. Conduct ALARA review and generate RWP with limiting conditions. 5. Post as "Airborne Radioactivity Area"—required items: RW II training, personal dosimetry, RWP (with prejob briefing), don PPE, bioassay submittal (as required). 6. Determine airborne radioactivity and contamination levels before initiating operation or personnel entry and verify acceptable entry conditions have been met and use engineering controls to maintain safe atmosphere and below specified RWP limit. Use RWP to authorize work. 7. IF engineering control fails to control contaminant below RWP limiting condition limits, THEN stop operation and evacuate personnel until RWP limiting conditions can be achieved. 8. IF IDLH atmosphere must be entered, THEN don appropriate air supplied respiratory protection (with escape capacity) and protective clothing.[b] At least one stand-by person dressed in proper PPE must be present for each entrant. **NOTE:** *The INL fire department also must be notified for any area or confined space entry into an IDLH atmosphere to ensure adequate rescue equipment and resources are in place.*
Hazardous noise levels	<85 dBA 8-hr TWA, <84 dBA 10-hr TWA	No action.
	85 to 114 dBA	Hearing protection required to attenuate hazard to below 85 dBA 8-hr TWA or 84 dBA for 10-hr TWA (device noise reduction rating).

Table 7-3. (continued).

Contaminant or Agent Monitored	Action Level	Response Taken if Action Levels are Exceeded
	(a) >115 dBA (b) >140 dBA	(a) Isolate source, evaluate noise reduction rating for single device, double protection as needed. (b) Control entry, isolate source, only approved double protection worn.
Radiation field	<5 mrem/hr	No action, no posting required.
	5 to 100 mrem/hr @ 30 cm (10 CFR 835.603(b)	Post as "Radiation Area"—Required items: Radiological Worker I or II training, RWP, personal dosimetry.
	>100 mrem to 500 rad @ 100 cm (10 CFR 835.603(b)	Post as "High Radiation Area"—Required items: RW II, RWP, alarming personal dosimetry, dose rate meter, and temporary shielding (as required).
Radionuclide contamination	1 to 100 times company values[c] (10 CFR 835.603(d)	Post as "Contamination Area"—Required items: RW II training, personal dosimetry, RWP, don PPE, bioassay submittal (as required).
	>100 times company values[c] (10 CFR 835.603(d)	Post as "High Contamination Area"—Required items: RW II training, personal dosimetry, RWP (with prejob briefing), don PPE, bioassay submittal (as required).
Other facility or INL alarms	Project operations, RWMC, or INL alarm	See Section 10.6 for emergency response action following facility or INL alarms.[c]

a. Level C respiratory protection will consist of a full-face respirator equipped with a HEPA filter cartridge as prescribed by the project IH and Radiological Control personnel (based on contaminant of concern). See Section 5 for additional Level C requirements.
b. Protective clothing to be selected by the IH in consultation with Radiological Control personnel based on the nature of the task and contaminants and hazards to be encountered.
c. Applicable company policies and procedures.

ALARA = as low as reasonably achievable
HEPA = high-efficiency particulate air
IDLH = immediately dangerous to life or health
IH = industrial hygienist
INL = Idaho National Laboratory
LEL = lower exposure limit
PPE = personal protective equipment
RW = radiological worker
RWP = radiological work permit
TWA = time-weighted average

7.2.1 Industrial Hygiene Area and Personal Monitoring and Instrument Calibration

The assigned MSCP IH will conduct full- and partial-period sampling of airborne contaminants and monitoring of physical agents during operations at a frequency deemed appropriate based on direct-reading instrument readings and changing conditions. The subcontractor is responsible for conducting contaminant monitoring of their employees. When performed, 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 remote-sensing monitoring may be conducted.

Various direct-reading instruments may be used to determine the presence of nonradiological and other physical agents. The frequency and type of sampling and monitoring will be determined by the MSCP HSO in consultation with the project IH who will assess operation conditions, direct-reading instrument results, observation, professional judgment, and in accordance with applicable company policies and procedures.

All monitoring instruments will be maintained and calibrated in accordance with manufacturer recommendations, existing IH protocol, and in conformance with applicable company policies, procedures, and safety and health manuals. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded.

7.2.2 Area Radiological Monitoring and Instrument Calibration

Radiological monitoring of radiation and contamination will be conducted during project activities to ensure that personnel are given adequate protection from potential radiological exposure. Instruments and sampling methods listed in Table 7-2 may be used by the RCT as deemed appropriate and as required by general or task-specific RWPs. When conducted, monitoring will be performed in accordance with applicable company manuals. Radiological Control personnel will use data obtained from monitoring to evaluate the effectiveness of project engineering controls and decontamination methods and procedures and to alert personnel to potential radiation sources.

All portable survey instruments will be source-checked daily to ensure they are within specified baseline calibration limits. Accountable radioactive sources will be maintained in accordance with applicable company policies and procedures. All radiological survey and monitoring equipment will be maintained and calibrated in accordance with manufacturer recommendations, existing Radiological Control protocol, and applicable company policies, manuals, and procedures.

7.2.3 Personal Radiological Exposure Monitoring

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

7.2.3.1 External Dosimetry. Dosimetry requirements will be based on the radiation exposure potential during project activities. Personnel entering specific areas may be required to wear, as a minimum, of a thermoluminescent dosimeter and, at the project site, other personal dosimetry devices

(e.g., albedo dosimetry) specified by Radiological Control personnel, in applicable project RWPs, and in accordance with the applicable company manuals.

The Radiological Control and Information Management System will be used to track external radiation exposures to project personnel and to serve as the administrative control mechanism for working in accordance with individual RWPs. Individual project personnel are responsible for ensuring all required personal information is provided to Radiological Control personnel for entry into Radiological Control and Information Management System and logging in when electronic dosimeters are used.

7.2.3.2 Internal Monitoring. The purpose of internal dose monitoring is to demonstrate 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 project activities or specific activities and will be determined by the assigned project radiological engineer. If bioassays are deemed appropriate by the radiological engineer, then requirements will be specified on the RWP, and personnel will be responsible for submitting required bioassay samples.

8. PERSONAL PROTECTIVE EQUIPMENT

This section provides guidance for the selection and use of personal protective equipment (PPE) to be worn for project activities 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 four levels of protection (Levels A, B, C, and D). Level D PPE is anticipated for most aspects of the MSCP project, but the correct level will be specified for each project in the integrated work control documents per MCP-3562 or STD-101. This section is available for the work control planner to aid in the preparation of work control documents and for the worker if further information on PPE is needed.

The purpose of personal protective clothing and equipment is to shield or isolate individuals from chemical, physical, radiological, biological, and safety hazards encountered during project activities 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. Proper work practices and adequate training will serve to augment PPE usage to provide the greatest level of worker protection.

The PPE policy requires field workers wear, as a minimum, sturdy leather boots above the ankles and safety glasses with side shields—which is classified as Level D protection. Safety boots will be required for activities where objects, materials, or equipment have the potential to fall on the feet of workers, occasional workers, visitors, and inspectors. The project HSO or safety engineer 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 applicable company policies and procedures. Selection of the proper PPE is based on the following considerations:

- Specific conditions and nature of the activities, including well equipment installation, well monitoring, and well maintenance activities
- Potential contaminant routes of entry
- Physical form and chemical characteristics of hazardous materials, chemicals, or waste
- Toxicity of hazardous materials, chemicals, or waste
- Duration and intensity of exposure (acute or chronic)
- Compatibility of chemical(s) with PPE materials and potential for degradation or breakthrough
- Environmental conditions (e.g., humidity, heat, cold, rain).

8.1 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 8-1. Respirators will not be required for specific project activities. 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 outlined in the project work control documents. Requirements for respirator use, emergency use, storage, cleaning, and maintenance as stated in the applicable company policies and procedures will be followed.

8.2 Personal Protective Equipment Levels

Level D PPE is the anticipated level of protection to be worn during the majority of MSCP project activities. Levels C, B, or A PPE are not anticipated for most MSCP project activities. Modifications to these levels will be made under the direction of the project HSO in consultation with the project IH and Radiological Control 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. The PPE level for project activities will be upgraded if warranted by the presence of contaminants above action limits.

8.2.1 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 physical hazards. Level D PPE will only be allowed in areas that have been characterized as having limited contamination hazards.

8.2.2 Level C Personal Protective Equipment

Level C PPE will be worn when the task site chemical and radiological 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%), and that there are no conditions that pose immediate danger to life or health.

Table 8-1. Levels and options of PPE.

Personal Protective Equipment Level	PPE 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 above the ankle for construction activities.	Chemical or radiological protective clothing (Tyvek or Saranex[a]) 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[b]: • Full-face-piece air-purifying respirator equipped with a NIOSH-approved 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-face-piece 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]) • 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).

Table 8-1. (continued).

Personal Protective Equipment Level	PPE Required	Optional Personal Protective Equipment or Modifications
B	Contingency only. Level C ensemble with the following respiratory and whole body protection upgrades[c,d]: • Chemical-resistant coveralls or encapsulating suit (Tyvek QC, Tychem 7500, Saranex 23-C, or equivalent) • Any other chemical or radiological PPE prescribed in site-specific RWP or safe work permit • Chemical-resistant butyl or one-time-use natural latex outer boots (as determined by the IH and RWP) • Inner chemical-resistant gloves with cotton liners (as determined by the IH and RWP) Outer chemical-resistant Viton or polyvinyl alcohol gloves (as determined by the IH).	Chemical-resistant outer shoe or boot cover (IH or RCT to specify material) Radiological modesty garments under outer protective clothing (as required by RWP) Any specialized protective equipment (e.g., hearing protection, welding lens, and aprons) (Safety glasses not required if wearing a full-face respirator)
A	Not anticipated for the MSCP	N/A

a. References herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U.S. Government, any agency thereof, or any company affiliated with the Idaho National Laboratory.
b. The PPE ensemble may be modified by the IH and/or RCT to provide protection from skin or other physical hazards.
c. Upgrades are determined by the IH in conjunction with other environment, safety, and health professionals.
d. Level B and A work will require approval from the program safety, health, and quality assurance manager and coordination with the INL fire department.

ANSI = American National Standards Institute
HEPA = high-efficiency particulate air
IH = industrial hygienist
INL = Idaho National Laboratory
NIOSH = National Institute of Occupational Safety and Health
RCT = radiological control technician
RWP = radiological work permit
SCBA = self-contained breathing apparatus

NOTE: *Personnel must inspect all PPE before donning and entry into any work zone. Items found to be defective or that become unserviceable during us, 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 8-1.*

8.3 Personal Protective Clothing Upgrading and Downgrading

The project HSO, in consultation with the project IH and Radiological Control 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 serve as the initial basis for making such decisions. Additional reasons for upgrading or downgrading are listed in the following subsections.

8.3.1 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.

8.3.2 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.

8.3.3 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 principal 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. Table 8-2 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 engineer, and RCT about PPE inspection criteria.

Table 8-2. Inspection checklist for personal protection equipment.

Personal Protection Equipment Item	Inspection
Respirators (full-face-piece air-purifying and supplied-air respirators with escape-only SCBA bottles or escape cartridges)	Before use: Ensure air line is the appropriate air line for the air line respiratory protection to be used. Inspect air line hose connections (sections of hose) to ensure all are threaded or permanent metal-to-metal connections (no quick disconnect pieces). Check condition of the face-piece, head straps, valves, connecting lines, 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. Check for proper setting and operation of regulators and valves, check all hose connections back to the breathing-air compressor, check the pressure to the air line station and on individual air line connections to ensure pressure is within required range (in accordance with the manufacturer's specifications).
Level D and C clothing	Before use: Visually inspect for imperfect seams, non-uniform 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.

SCBA = self-contained breathing apparatus
PPE = personal protective equipment

9. OCCUPATIONAL MEDICAL SURVEILLANCE

Project personnel will participate in the INL Occupational Medical Surveillance Program (or equivalent subcontractor program), as required by DOE Order 414.1C, "Quality Assurance," and 29 CFR 1910.120 and 29 CFR 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 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 or more days per year or as required by 29 CFR 1910.134, "Respiratory Protection."

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, "Respiratory Protection," and PRD-2109, "Respiratory Protection."

A copy of the 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 INL Division of Occupational Medicine physician (and subcontractor physicians) conducting medical surveillance for employees participating in this project. Exposure-monitoring results and hazard information furnished to the Division of Occupational Medicine physician will be supplemented or updated annually as long as the employee is required to maintain a hazardous waste and material employee medical clearance. The Division of Occupational Medicine physician will then evaluate the physical ability of an employee to perform the assigned work.

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. Supervision is responsible to communicate medical restrictions to workers during the MCP-3003 prejob briefing. The supervisor conducting the briefing should ask workers if they have any work restrictions. However, it is the employee's responsibility to inform the supervisor of any work or medical restrictions.

9.1 Subcontractor Workers

Subcontractor project personnel will participate in a subcontractor medical surveillance program that satisfies the applicable requirements of 29 CFR 1910.120 and 29 CFR 1926.65. As stated above, this program must make medical examinations available before assignment, annually, and after termination of hazardous waste duties. 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 INL Occupational Medical Program physicians upon request in accordance with PRD-183, "Radiological Control Manual"; MCP-188, "Issuing TLDs and Obtaining Personnel Dose History"; MCP-2381, "Personnel Exposure Questionnaire"; and PRD-3001, "Radiological Control Requirements for INL Construction Subcontractors."

9.2 Injuries on the Site

It is the policy of the INL/ICP that an INL Occupational Medical Program physician must examine all ICP 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 ICP.

NOTE: *In the event of an illness or injury, the decision to provide first aid and transport to the nearest medical facility or whether to immediately request an ambulance and continue to stabilize and provide first aid should be based on the nature of the injury or illness and likelihood that transporting the individual could cause further injury or harm. Most likely, the person making this decision will only be trained to the medic first-aid/cardiopulmonary resuscitation level and should contact the CFA medical facility at 777 or 351-6663 for further guidance if there is any question as to the extent of injury or potential to cause further harm by moving 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 INL medical facility for evaluation and treatment (as necessary). The medical facilities are at CFA (CFA-1612); Reactor Technology Complex (TRA-667); and INTEC (CPP-645). 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 Occupational Medical Program director in compliance with 29 CFR 1910.120 and 29 CFR 1926.65.

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

The 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 INL medical facility, the FTL or designee will make notifications, as indicated in Section 10.

9.3 Substance-Specific Medical Surveillance

If contaminants (listed in 29 CFR 1910, Subpart Z) with substance-specific standards have been identified at the project site or if new contaminants of concern are identified during the course of project activities, 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.

10. EMERGENCY RESPONSE PLAN

This section 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 hands off to the INL Emergency Response Organization and information on PLN-114, "Emergency Management," which describes the overall process developed to respond to and mitigate consequences of emergencies that might arise at the INL Site.

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

NOTE: *The OSHA HAZWOPER definition of an emergency is not defined the same as classified by DOE Order 151.1C, "Comprehensive Emergency Management System," and DOE Order 231.1A, "Environment, Safety, and Health Reporting." For this reason, the term "event" will be used in this section when referring to project HAZWOPER emergencies.*

10.1 Emergency Preparation and Recognition

Emergency preparation and recognition will also require project personnel to be constantly alert for potentially hazardous situations and signs and symptoms of chemical exposure or releases. The requirements of MCP-2725, "Field Work," for training, emergency actions, and notifications will be followed for all projects conducted outside facility boundaries.

Preparation and training on emergencies will include proper site access and egress procedures in response to project events and INL/ICP emergencies as part of the project-specific orientation training and facility access training (where applicable). Visitors will also 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 INL Fire Department personnel. Emergencies could include the following scenarios:

- Accidents resulting in injury
- Accidents resulting in radiological exposures
- Fires
- Explosions
- 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.

10.2 Emergency Alerting, Responses, and Sheltering

10.2.1 Alarms

Alarms and signals are used at the project site and the INL Site 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 INL Site serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. To signal site personnel of a project-initiated 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 audible 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.

- ***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 can also 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.

- ***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 emergency coordinator or FTL/JSS if outside a facility. The FTL/JSS or trained alternate will then complete the personnel accountability using the attendance log. In this situation, the FTL/JSS or project

area warden (where required) will report the results of the accountability process to the facility emergency coordinator.

- ***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 INL/ICP 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 can also be given by word of mouth, radio, facility announcing system, 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/JSS. 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.
	Two short blasts—Non-emergency evacuation of immediate work area. Proceed to designated assembly area as specified by the field team leader.
	Three long blasts or verbally communicated—All clear, return to project site.

10.3 Role of Project Personnel in Emergencies

Depending on the event, a graded response and subsequent notifications will take place. Responsibilities of the FTL/JSS and project personnel 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 will also be covered as part of the briefing on this document and/or project specific work control documents, as identified in Table 6-1.

10.3.1 Field Team Leader/Job Site Supervisor

The FTL/JSS (or designated alternate) is responsible for initiating all requests for emergency services (e.g., fire and medical) and for notifying the INTEC plant shift supervisor and the facility the project is working in, if different, of abnormal (or potential emergency) events that could occur during the project. The INTEC plant shift supervisor shall be notified of all incidents, accidents, and injuries regardless of the work activity location. The FTL/JSS may also serve as the area warden (where required) (or designate that responsibility to another person who has been trained as area warden as applicable) and will conduct personnel accountability based on the attendance log. In addition, the FTL/JSS 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/JSS (or designated alternate) will provide all information about the nature of the event, potential hazards, and other information requested.

10.3.2 Project Personnel

Every person at the project site has an assignment during a project event or INL/ICP emergency. Each employee must be constantly aware of potential problems or unexpectedly hazardous situations and immediately report these situations to the FTL/JSS (or designated alternate). All personnel are expected to watch out for their fellow workers, to report their concerns to the FTL/JSS, and to take emergency actions as described in this section. Roles and responsibilities are further detailed in Table 10-2. Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and local evacuation alarms.

Table 10-2. Responsibilities during an emergency.

Responsible Person	Action Assigned
FTL/JSS/HSO (or designee)	Take cover
	Signal evacuation
	Report spill to shift supervisor and take mitigative actions[a]
	Report incipient (beginning-stage) fires or well-developed to the INL Fire Department
	Contact the INTEC Plant shift supervisor or Warning Communications Center (if the shift supervisor cannot be contacted)
FTL/JSS/HSO (or trained designee)	Serve as area warden and 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 INTEC Plant shift supervisor or emergency coordinator will contact the Environmental Affairs spill response categorization and notification team. If outside a facility boundary, the FTL/JSS/HSO may become the emergency coordinator.

FTL = field team leader
HSO = health and safety officer
JSS = job site supervisor

10.3.3 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 will immediately report the incident to the Warning Communications Center. Reporting requirements will be determined by the designated emergency coordinator in accordance with MCP-190, “Event Investigation and Occurrence Reporting,” and MCP-3480. If any release of a hazardous material occurs, task site personnel will comply with the following immediate spill response actions. Notification will be made via the spill notification pager (pager 6663 or 351-6663) or the Warning Communications Center (526-1515).

NOTE: *Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of this section. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.*

10.3.3.1 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/JSS.

10.3.3.2 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/JSS
- **Secure** any release paths if safe to do so.

10.4 Decontamination

Decontamination of personnel and equipment is described in the RWP and/or other work control documents. Every effort will be made to prevent contamination of personnel and equipment through the use of engineering controls, isolation of source materials, contaminant monitoring, and 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 might be necessary to control the contact hazard.

All decontamination will be performed in accordance with Radiological Control, IH, and/or regulatory compliance support guidance. All personnel, clothing, equipment, and samples leaving an exclusion zone (contaminated or potentially contaminated area) will be decontaminated to remove harmful substances that might have adhered to them. All PPE and decontamination materials contacting hazardous waste will be managed in accordance with MCP-3480, and Form 435.39, “INL Waste Determination and Disposition Form (WDDF),” for waste from decontamination or for items to be

disposed of rather than decontaminated. For subcontracted work, comply with PRD-4001, "Environmental Requirements for Subcontractor Materials, Equipment, and Services." This section provides general decontamination guidelines. If necessary, additional details for decontaminating materials will be addressed in each project's work control documentation and will be discussed during the project-specific health and safety briefing held prior to commencing field activities.

As applicable, all personnel will be surveyed for radioactive contamination prior to exiting the radiological control work area. Readings 100 counts above background will require that the person immediately notify the FTL/JSS and RCT. The RCT will be responsible for all radiological decontamination efforts at the task site.

10.5 Emergency Communications

In the event of an emergency, the capability to summon INL/ICP emergency response resources, to immediately notify site personnel, and to 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. The following communication methods will be used during emergency situations.

10.5.1 Notifications

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

NOTE: *The WCC will be notified of the event and the information listed below will be communicated.*

- The caller's name, title (e.g., FTL/JSS 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.

10.6 Emergency Facilities and Equipment

Emergency response equipment maintained at the project site includes the items listed in Table 10-3. The facility-specific addenda to PLN-114 list emergency equipment available at each facility. This includes the command post, self-contained breathing apparatus, dosimeters, air samplers, decontamination and first aid equipment, and an emergency response trailer. The INL Fire Department maintains an emergency hazardous material response van that can be used to respond to an event or emergency at the project. The INL Fire Department personnel are also trained to provide immediate

hazardous material spills and medical services. In addition, medical personnel at the CFA-1612 medical facility evaluate and stabilize injured personnel or those experiencing signs and symptoms of exposure.

Table 10-3. Emergency response equipment to be maintained at the project site during work.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection or Verification
First-aid kit	Project staging area	HSO	Weekly: check seal; inventory required only if seal is broken
Eyewash bottles[a] Eyewash station[a]	Project staging area	HSO	Weekly
Hazardous materials spill kit[b]	Project staging area	HSO	Weekly verification
Extra personal protective equipment[b]	Project staging area	HSO	Weekly verification
Communication equipment (operational) [b]	Onsite	STR/FTL	Daily radio or phone check
Fire extinguishers[c]	Project site (staged for accessibility near work site boundaries)	HSO	Monthly

a. An eyewash bottle will be used to provide an immediate eye flush (if required). The HSO will identify the location of the eyewash station during the prejob briefing. Eyewash stations shall be maintained and inspected in accordance with MCP-3807, "Placement, Inspecting, Testing, and Maintaining Emergency Eyewash and Shower Equipment."
b. FTL, STR, or sample logbook may be used to record equipment inspection, for equipment that does not have its own tag.
c. As determined by the evaluation required in Section 3.3.5 of this document.. Notification to the INTEC Plant Shift Supervisor and personnel on the emergency contact list is required in the event of fire extinguisher discharge.

10.7 Evacuation Assembly Areas and Central Facilities Area Medical Facility

Each 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 and the nearest medical facility route will be posted at the project site.

NOTE: *If the project is conducted outside of a facility, then the INL/ICP evacuation routes listed in PLN-114 will be used.*

10.8 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.

10.8.1 Reentry

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

- Performing personnel search and rescues
- Responding to medical first aid needs
- Performing safe shutdown actions
- Performing mitigative 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.

10.8.2 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 will appoint the recovery manager.

10.9 Telephone and Radio Contact Reference List

Table 10-4 is an example of the points of contact for a project. The contact list will be completed for each project work area and placed where all project personnel have access to it in the event of an emergency. A copy of this list will be kept in the FTL, STR, or sample logbook, if applicable. Because personnel listed may change frequently, working copies of this list will be generated as required to note new positions and changes of assigned personnel. This Plan will not be revised with a Document Revision Form to note these changes.

Table 10-4. Example of Typical Project Emergency Contact List.

Contact Title	Contact Name	Phone Number/ Radio Net	Cell/Pager Number
*Medical / Fire (Emergency)	—	From cell phone 526-7777 From site phone 777	—
*Warning Communications Center	—	526-1515 (Spills) 351-6663 INL-OSC Stating "WCC or KID-240"	Spill Pager 526-4444 then pager 6663
*INTEC Plant Shift Supervisor (Report all incidents/accidents/injuries)	—	526-3100 521-0883	Pager 2096
*MSCP Area Project Manager	Lane Butler	526-9124	351-9260 Pager 4143
*MSCP Safety, Engineering, and Work Planning Director	Martin Doornbos	526-0676	521-7839
*Director of CERCLA/LTS Projects	Doug Burns	526-7472	351-9825
*MSCP Safety and Health Lead	Larry McManamon	526-3658	521-8405
*Project Manager			
Field Team Leader			
Subcontract Technical Representative			
ICP Safety and Health Director	Bill Grace	526-1163	351-9765 Pager 1070
Occupational Medical Program	—	526-2356	—
Regulatory Support – CERCLA	Lee Tuott	526-7990	351-7326 Pager 5138
Regulatory Support - VCO	Dave Hutchison	526-9263	521-0982
DOE-ID Facility Representative	Brad Davis	526-5381	Pager 6516
Alternate	Jerry McNew	526-5108	521-7394 Pager 7619

Note: The Field Team Leader shall notify all relevant personnel with an * adjacent to their title.

Further notifications will be conducted by the various levels of management with the director being responsible to ensure all notifications have been made.

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
INTEC = Idaho Nuclear Technology and Engineering Center
LTS = Long-Term Stewardship
MSCP = Miscellaneous Sites Cleanup Project
OSC = On-scene command
VCO = Voluntary Consent Order

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