



**Idaho
National
Engineering
Laboratory**

Health and Safety Plan for Test Reactor Area Perched Water System Operable Unit 2-12

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**Idaho National Engineering and Environmental Laboratory
Lockheed Martin Idaho Technologies Company
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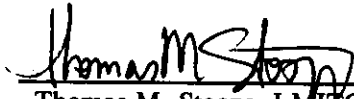
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**Health and Safety Plan for
Test Reactor Area Perched Water System
Operable Unit 2-12**

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Approved by:



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ABSTRACT

This Health and Safety Plan (HASP) establishes the procedures and requirements that will be used to minimize health and safety risks to persons working at the Test Reactor Area Perched Water System Operable Unit 2-12 site, as required by the Occupational Safety and Health Administration standard, 29 Code of Federal Regulations (CFR) 1910.120. It contains information about the hazards involved in performing the work, and the specific actions and equipment that will be used to protect persons working at the site. This HASP has been prepared to comply with the hazard classification in the *Hazard Classification of Environmental Restoration Activities at the INEL* (Peatross, 1996).

CONTENTS

ABSTRACT	iii
ACRONYMS	ix
1. INTRODUCTION	1
1.1 INEEL Site Description	1
1.2 Work Site Description	3
1.3 Scope of Work	3
2. WORK SITE RESPONSIBILITIES	6
2.1 Work Site Personnel	6
2.1.1 ER Director	6
2.1.2 LMITCO Project Manager	6
2.1.3 LMITCO Field Team Leader	6
2.1.4 Site Personnel	8
2.1.5 Nonworkers	8
2.1.6 Health and Safety Officer	8
2.1.7 Industrial Hygienist	9
2.1.8 Safety Engineer	9
2.1.9 Radiological Control Technician	9
2.1.10 Radiological Engineer	9
2.1.11 Occupational Medical Program	10
2.1.12 Facility Tenant Manager	10
2.1.13 Facility Landlord or Representative	10
2.1.14 Environmental Compliance Engineer	10
2.1.15 Quality Engineer	10
2.2 Recordkeeping Requirements	11
2.2.1 Industrial Hygiene and Radiological Monitoring Records	11
2.2.2 FTL Logbook and Site Attendance Logbook	11
2.2.3 Administrative Record and Document Control Office	11
3. PERSONNEL TRAINING	12
4. OCCUPATIONAL MEDICAL PROGRAM AND SURVEILLANCE	14
4.1 Subcontractor Workers	15

4.2	Injuries on the Work Site	15
4.3	Substance-Specific Medical Surveillance	16
5.	SAFE WORK PRACTICES	17
5.1	General Safe Work Practices	17
5.2	ALARA Principles	18
5.3	The Buddy System	19 18
6.	SITE CONTROL AND SECURITY	20
6.1	Exclusion Zone	20
6.2	Contamination Reduction Zone	20
6.3	Support Zone	21
6.4	Designated Eating Area	21
7.	HAZARD EVALUATION	22
7.1	Hazard Assessment	22
7.2	Environmental and Personnel Monitoring	24
7.2.1	Industrial Hygiene Monitoring	24
7.2.2	Radiological Monitoring	24
7.2.3	Action Levels	27 5
7.3	Physical Hazards Evaluation, Control, and Monitoring	27
7.3.1	Temperature Extremes	27
7.3.2	Noise	28
7.3.3	Fire and Explosion Hazards	28
7.3.4	Confined Spaces	28
7.3.5	Industrial Safety Hazards	28
7.3.6	Sampling Equipment	29
7.3.7	Moving Machinery and Falling Objects	29
7.4	Other Work Site Hazards	31

8.	PERSONAL PROTECTIVE EQUIPMENT	32
8.1	Level D Personal Protective Equipment	32
9.	DECONTAMINATION PROCEDURES	33
9.1	Decontamination of Personnel and Equipment	33
9.1.1	Decontamination in Medical Emergencies	33
9.1.2	Equipment Decontamination and Disposal of Contaminated Materials	33
9.1.3	Site Sanitation and Waste Minimization	33
10.	EMERGENCY RESPONSE PLAN FOR WORK SITE	35
10.1	TRA Emergency Action Procedures	35
10.1.1	Steady Siren	35
10.1.2	Alternating Siren	35
10.2	Emergency Equipment on the Site	37
10.3	Telephone/Radio Contact Reference List for TRA Perched Water System Monitoring	39
11.	REFERENCES	41
12.	HEALTH AND SAFETY PLAN TRAINING ACKNOWLEDGMENT	42
13.	HAZWOPER 24 HOUR SUPERVISED FIELD EXPERIENCE ACKNOWLEDGMENT	44

FIGURES

1.	Map of the INEEL showing locations of major facilities	2
2.	Map of TRA Perched Water System OU 2-12	4
3.	Field organization chart	7
4.	Locations of emergency facilities and staging areas	36

TABLES

1.	Required training for work site personnel	13
2.	Work site activities and associated hazards	22

3.	Hazardous (including radiological) materials and radiation fields present at the TRA deep PWS and the SRPA	23
4.	Contaminants to be monitored	25
5.	Equipment to be used for monitoring	25
6.	Action levels for the work site	26
7.	Responsibilities during an emergency	38
8.	Emergency response equipment to be maintained at the work site	38

ACRONYMS

ALARA	as low as reasonably achievable
ALI	annual limit of intake
ARDC	Administrative Record and Document Control
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CM	construction manager
CNS	central nervous system
D&D	decontamination and dismantlement
DOE	Department of Energy
DOE-ID	DOE Idaho Operations Office
DOT	Department of Transportation
EAM	emergency action manager
EC	emergency coordinator
EDF	engineering design file
EPA	Environmental Protection Agency
ER	Environmental Restoration
ERP	Environmental Restoration Program
FTL	field team leader
FUM	Facilities, Utilities and Maintenance
GFCI	ground fault circuit interrupter
ICPP	Idaho Chemical Processing Plant
HAZWOPER	hazardous waste operations

HSO	health and safety officer
HASP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
JES	Job Entry Supervisor
JSS	job site supervisor
LMITCO	Lockheed Martin Idaho Technologies Company
MCP	Management Control Procedure
MSDS	material safety data sheet
MTR	Materials Test Reactor
REM	roentgen equivalent man
NIOSH	National Institute of Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PBF	Power Burst Facility
PEL	permissible exposure limit
PID	photoionization detector
PPE	personnel protective equipment
PRD	program requirements directive
RCT	radiological control technician
RD/RA	remedial design/remedial action

RWMC	Radioactive Waste Management Complex
RWP	Radiological Work Permit
SCBA	self-contained breathing apparatus
STEL	short term exposure limit
SWP	safe work permit
TIS	Training Inquiry System
TLV	threshold limit value
TPR	Technical Procedure
TRA	Test Reactor Area
USCG	United States Coast Guard
WCC	Warning Communications Center
WROC	Waste Reduction Operations Complex

Health and Safety Plan for Test Reactor Area Perched Water System Operable Unit 2-12

1. INTRODUCTION

This Health and Safety Plan (HASP) establishes the procedures and requirements that will be used to minimize health and safety risks to persons working at the work site. This HASP has been prepared to meet the requirements of the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1910.120, "Hazardous Waste Operations and Emergency Response." It has been prepared in recognition of and is consistent with the National Institute of Occupational Safety and Health (NIOSH)/OSHA/United States Coast Guard (USCG)/Environmental Protection Agency (EPA) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985); the Lockheed Martin Idaho Technologies Company (LMITCO) *Company Procedures Manual*; the LMITCO *Health and Safety Manual*; the *INEEL Radiological Control Manual* and the *LMITCO Radiological Control Subject Area Manual*.

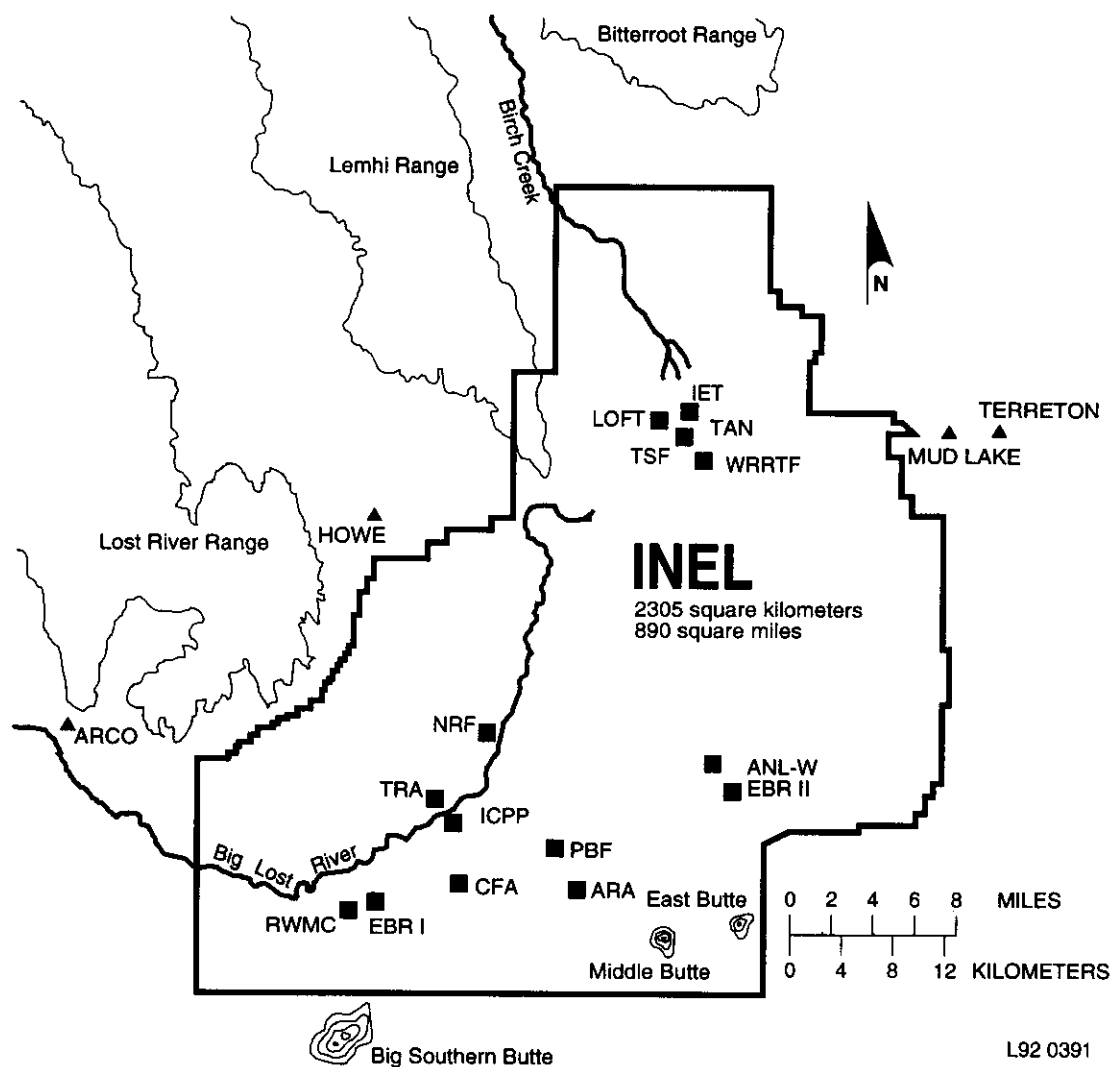
This HASP shall govern all work at the work site that is performed by employees of LMITCO and Parsons Engineering Science (ES), subcontractors to LMITCO and Parsons ES, and employees of other companies or Department of Energy (DOE) laboratories. Persons not normally assigned to work at the work site, such as representatives of DOE, the State of Idaho, OSHA, and the EPA shall be considered nonworkers and fall under the definition of occasional site workers as stated in OSHA 29 CFR 1910.120.

This HASP will be reviewed and revised by the health and safety officer (HSO) in conjunction with the LMITCO field team leader (FTL) and other health and safety professionals, including the LMITCO ER ES&H manager, as necessary to ensure the effectiveness and suitability of this HASP.

1.1 INEEL Site Description

The Idaho National Engineering and Environmental Laboratory (INEEL), formerly the National Reactor Testing Station (NRTS), encompasses 890 mi², and is located approximately 20 mi west of Idaho Falls, Idaho (Figure 1).

The United States Atomic Energy Commission, now DOE, established the NRTS in 1949 as a site for building and testing a variety of nuclear facilities. The INEEL has also been the storage facility of transuranic radionuclides and low-level radioactive waste since 1952. At present, the INEEL supports engineering and operations efforts of DOE and other Federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management technology development, and energy technology and conservation programs. The DOE Idaho Operations Office (DOE-ID) has responsibility for the INEEL, and designates authority to operate the INEEL to Government contractors. The primary contractor for DOE-ID at the INEEL is LMITCO. LMITCO provides managing and operating services to the majority of INEEL facilities.



ARA	Auxiliary Reactor Area
ANL-W	Argonne National Laboratory-West
CFA	Central Facilities Area
EBR I	Experimental Breeder Reactor I
EBR II	Experimental Breeder Reactor II
ICCP	Idaho Chemical Processing Plant
IET	Initial Engineering Test
LOFT	Loss-of-Fluid Test Facility
NRF	Naval Reactor Facility
PBF	Power Burst Facility
RWMC	Radioactive Waste Management Facility
TAN	Test Area North
TRA	Test Reactor Area
TSF	Test Support Facility
WRRTF	Water Reactor Research Test Facility

Figure 1. Map of the INEEL showing locations of major facilities.

1.2 Work Site Description

TRA is located in the southwestern portion of the INEEL, north of the Big Lost River and approximately 47 miles west of Idaho Falls (see Figure 1). The area around TRA is flat with a gentle slope to the west southwest corner and to the east northeast corner. TRA occupies an area that measures 1,900 by 1,700 ft and is surrounded by a double security fence.

Wastewater discharges has occurred at several locations at TRA, including the warm waste pond, cold waste pond, an injection well, and a chemical waste pond. Contaminants have percolated downward through the surficial alluvium into the underlying basalt bedrock (Lewis and Sinton et al., 1992). The ROD for the Perched Water System (PWS) was signed in October 1992 and mandated that no remedial action is required; however, monitoring of the system is needed. The groundwater samples taken to date have indicated the presence of volatile organic compounds only slightly above the detection limits and cadmium, chromium, and manganese above the Federal limits for groundwater in the PWS. Fluoride and radionuclides (e.g., tritium and strontium-90) are also present in the PWS. The Snake River Plain Aquifer (SRPA) groundwater sampling in this area has shown the presence of chromium and tritium.

1.3 Scope of Work

Groundwater samples will be collected from a series of monitoring well locations surrounding and within TRA. Groundwater elevations will be recorded as part of the field activity. The specific well locations are identified in the field sampling plan (FSP) and are summarized below. The wells are completed in the deep PWS and the SRPA.

SRPA	Deep PWS	
TRA-07	PW-11	USGS-54
U.S. Geological Survey (USGS)-58	PW-12	USGS-55
USGS-65	USGS-53	USGS-56

Figure 2 illustrates the general site locations for these wells. Sampling will be conducted as specified in Technical Procedure (TPRs) 56, "Groundwater Sampling," and TPR-58, "Measurement of Groundwater Levels." The details regarding well purging techniques and sample container requirements are documented in these procedures. Decontamination will be conducted in accordance with TPR-52, "Field Decontamination of Sampling Equipment."

Groundwater sampling involves collecting groundwater for geochemical and radionuclide contaminant chemistry analysis. Before purging and sampling of the well, the static water level in the well will be measured as specified in TPR-58. The water in the well is purged (usually three to five times the calculated volume of water in the well to obtain a representative sample.

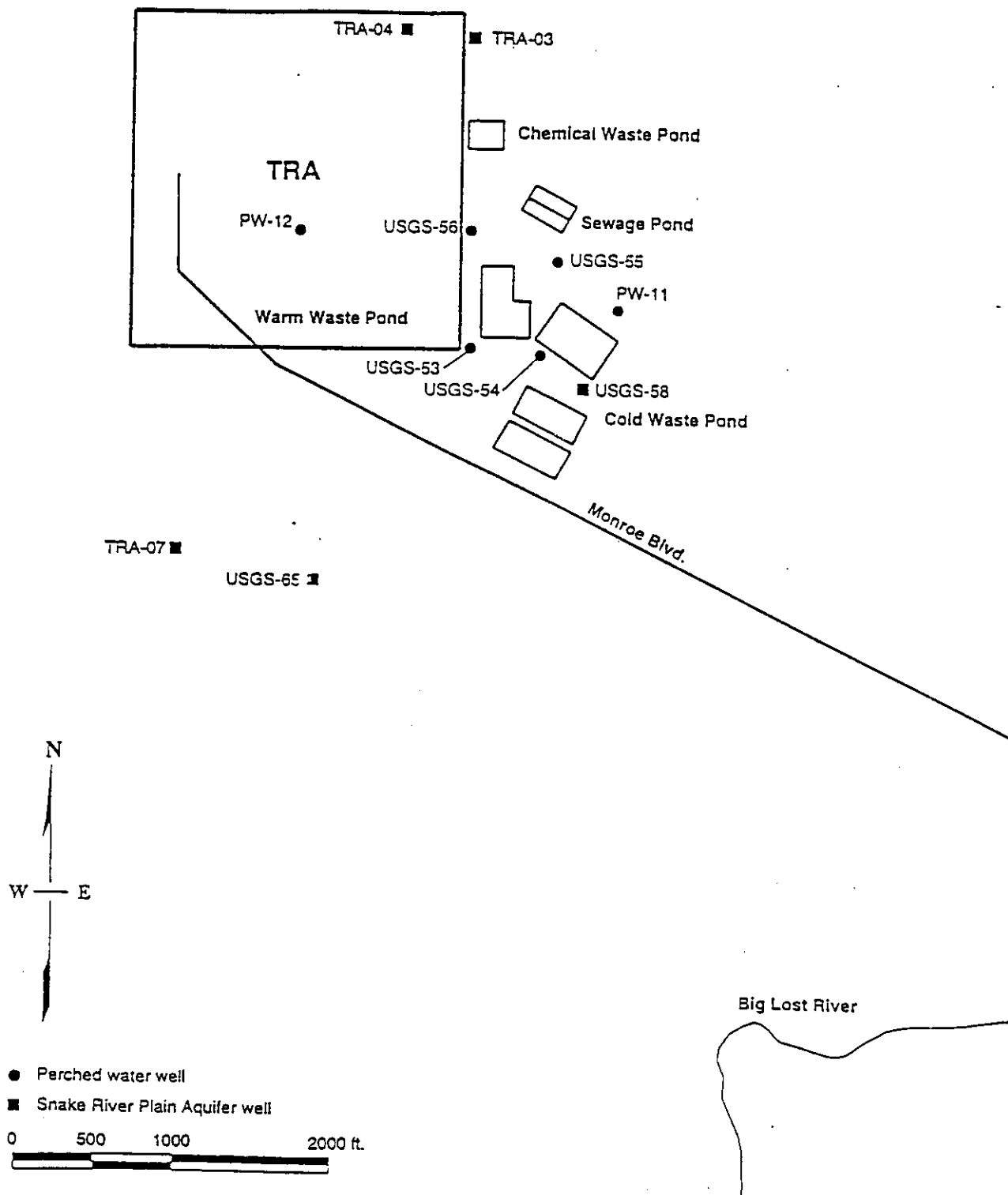


Figure 2. Map of TRA Perched Water System OU 2-12.

A bottom filling bailer or suitable sampling pump will be used to remove the stagnant water in the monitoring wells and to obtain samples. The sampler will use gloves to transfer water samples to suitable containers to prevent possible contact. Other protective equipment requirements will be covered in a later section of this HSP. Field equipment blanks and duplicates will be collected and all sample containers will be labeled appropriately, as specified in the Post-ROD Monitoring Plan (EG&G Idaho 1993e).

2. WORK SITE RESPONSIBILITIES

2.1 Work Site Personnel

The organizational structure for this work reflects the resources and expertise required to perform the work, while minimizing risks to worker health and safety. Names of the individuals who will be filling the key roles at the work site, and lines of responsibility and communication are shown on the organizational chart for the work (Figure 3). The following subsections outline responsibilities of key site personnel.

2.1.1 ER Director

The LMITCO Environmental Restoration (ER) director has ultimate responsibility for the technical quality of all projects and safety of personnel during field activities performed by or for the Environmental Restoration Program (ERP). The ER director provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ER director ensures that:

- All activities are conducted in accordance with DOE, EPA, OSHA, and State of Idaho requirements and agreements
- Program budgets and schedules are monitored and approved
- Availability of necessary personnel, equipment, subcontractors, and services is provided
- Direction for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports is provided.

2.1.2 LMITCO Project Manager

The LMITCO project manager has the responsibility for ensuring that all activities conducted during the project are in compliance with the LMITCO ER Management Control Procedures (MCPs) and Program Requirements Directives (PRDs) and all applicable OSHA, EPA, DOE, Department of Transportation (DOT), and State of Idaho requirements. The project manager is responsible for ensuring that tasks comply with the *Quality Program Plan for the Environmental Restoration Program* (QPP-149), the quality assurance project plan, this HASP, and the sampling and analysis plan. The project manager coordinates all field, laboratory, and modeling activities.

2.1.3 LMITCO Field Team Leader

The LMITCO FTL is the individual representing LMITCO ER at the work site, with ultimate responsibility for the safe and successful completion of the project for LMITCO assigned tasks. The FTL works with the job site supervisor (JSS) to manage field operations and execute the work plan. The FTL enforces site control and documents work site activities. The FTL and JSS conduct daily safety briefings.

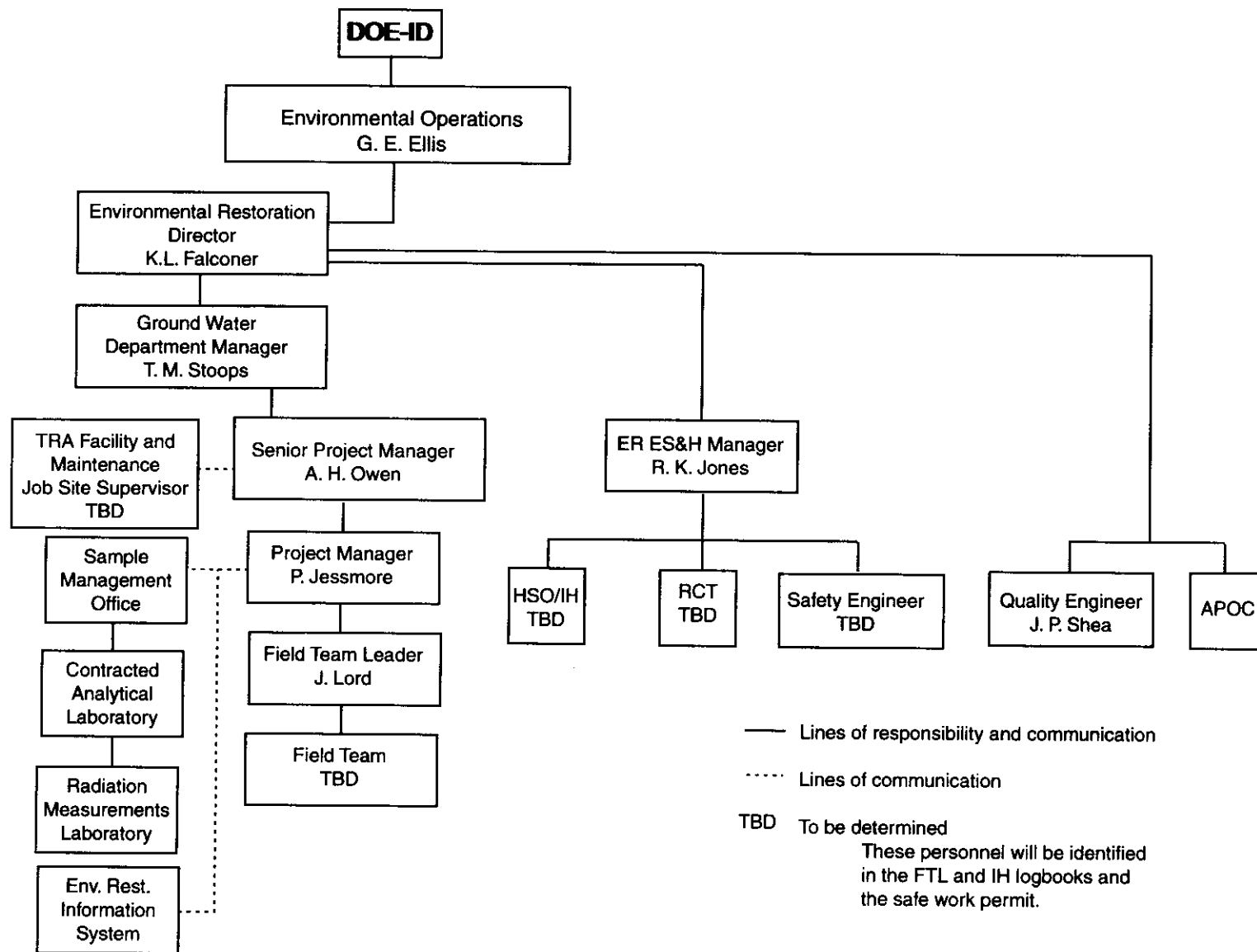


Figure 3. Field organizational chart.

If the FTL leaves the work site, an alternate individual will be appointed to act as the FTL. Persons acting as the FTL on the work site must meet all training requirements for the FTL, as outlined in Section 3. The identity of the acting FTL shall be conveyed to work site personnel and recorded in the FTL logbook, and should also be communicated to the facility representative when appropriate.

2.1.4 Site Personnel

All work site personnel, including LMITCO and subcontractor personnel, are responsible for understanding and complying with requirements of this HASP. Work site personnel will be briefed by the FTL or JSS at the start of each shift. Work site personnel should identify potentially unsafe situations or conditions to the FTL JSS, or HSO for corrective action. *If unsafe conditions develop, work site personnel are authorized to stop work and notify the FTL of the unsafe condition.*

2.1.5 Nonworkers

All persons who may be on the work site, but are not a part of the field team at the project site are considered nonworkers for the purposes of this project. A person shall be considered to be "on site" when they are present in or beyond the designated support zone. Nonworkers will be deemed occasional site workers per 29 CFR 1910.120, and must meet minimum training requirements for such workers as described in the OSHA standard, and any additional task-specific training that is identified in Section 3.

All nonworkers, including LMITCO employees from other departments and representatives of DOE or State or Federal regulatory agencies may not proceed beyond the support zone without receiving site-specific training, signing a site-specific training acknowledgment form, receiving a safety briefing, wearing the appropriate protective equipment, and providing proof of meeting the training requirements specified in Section 3 of this HASP. Nonworkers will be escorted by a fully trained work site representative (such as the FTL, or HSO, or a designated alternate) at all times while on the site.

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

2.1.6 Health and Safety Officer

The HSO is the person located at the work site who serves as the primary contact for health and safety issues. The HSO advises the FTL on all aspects of health and safety, and is authorized to stop work at the site if any operation threatens worker or public health or safety. The HSO must participate in the development of this document. The HSO has other specific responsibilities as stated in other sections of this HASP. The HSO is authorized to verify compliance to the HASP, conduct conformance inspections and require and monitor corrective actions, monitor decontamination procedures and require corrections, as appropriate. The HSO is supported by other health and safety personnel at the work site (safety engineer, IH, RCT, radiological engineer, and facility representative, as necessary).

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

2.1.7 Industrial Hygienist

The LMITCO IH is the primary source of information regarding nonradiological hazardous and toxic agents at the work site. The IH assesses the potential for worker exposures to hazardous agents in accordance with LMITCO company procedures and the LMITCO *Health and Safety Manual*. The IH assesses and recommends appropriate hazard controls for protection of work site personnel, reviews the effectiveness of monitoring and personal protective equipment (PPE) required in this HASP, and recommends changes as appropriate. Following an evacuation, the IH will assist in determining whether conditions at the task site are safe for reentry. Employees showing health effects resulting from possible exposure to hazardous agents will be referred to the Occupational Medical Program (OMP) by the IH, their supervisor, or the HSO. The IH may have other duties at the task site as specified in other sections of this HASP, or in company procedures and manuals. During emergencies involving hazardous materials, IH measurements will be performed by members of the Emergency Response Organization.

2.1.8 Safety Engineer

The LMITCO safety engineer reviews work packages, observes site activity, assesses compliance with the LMITCO *Health and Safety Manual*, issues Welding and Cutting Permits, advises the FTL on required safety equipment, and recommends solutions to industrial safety issues that arise at the task site. The safety engineer may have other duties at the task site as specified in other sections of this HASP, or in company procedures and manuals. The fire protection engineer function is under the safety engineer designation and is the person assigned to review work packages and performs field assessments for fire protection controls.

2.1.9 Radiological Control Technician

The LMITCO RCT is the primary source of information and guidance on radiological hazards. The RCT will be present at the task site during any work operations when a radiological hazard to operations personnel may exist or is anticipated. Responsibilities of the RCT include radiological surveying of the work site, equipment, and samples; providing guidance for radiological decontamination of equipment and personnel; and accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radiological contamination occurs. The RCT must notify the FTL of any radiological occurrence that must be reported as directed by the *INEEL Radiological Control Manual*.

2.1.10 Radiological Engineer

The radiological engineer is the primary source of information and guidance relative to the evaluation and control of radioactive hazards at the work site. The radiological engineer makes recommendations to minimize health and safety risks of work operations personnel if a radiological hazard exists or occurs at the work site. 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 FTL and RCT of changes in monitoring or PPE, and advising on work site evacuation and reentry. The radiological engineer may also have other duties to perform as specified in other sections of this HASP, or in company procedures and manuals.

2.1.11 Occupational Medical Program

The INEEL OMP provides medical surveillance for LMITCO personnel assigned as hazardous waste site workers per the 29 CFR 1910.120 (HAZWOPER) OSHA standard. The OMP is also responsible for evaluation of all personnel (including subcontractor) injured or exposed to hazardous materials at the work site. Subcontractors are required to have a separate occupational medical surveillance program for hazardous waste operations (HAZWOPER) activities. See Section 4 for details of the medical surveillance program.

2.1.12 Facility Tenant Manager

The LMITCO facility tenant manager is responsible for maintaining their assigned facility, and must be cognizant of work being conducted in the facility. The facility tenant manager may be required to sign the safe work permits (SWPs) and radiological work permits (RWPs) governing work performed at the facility.

2.1.13 Facility Landlord or Representative

The LMITCO facility landlord is responsible for the safety of personnel and the safe completion of all project activities conducted within their area. Therefore, the facility landlord (or their representative) will be kept informed of all activities performed in the area. Where applicable, the facility landlord (or representative) and FTL shall agree upon a schedule for reporting work progress and plans for work. The facility landlord (or representative) may serve as advisor to work operations personnel with regard to the area operations.

2.1.14 Environmental Compliance Engineer

The LMITCO environmental compliance engineer oversees, monitors, and advises LMITCO organizations performing field activities at the INEEL. Responsibilities include ensuring compliance with DOE orders, EPA regulations, and other regulations concerning effects of activities on the environment. The environmental compliance engineer provides support surveillance services for hazardous waste storage and transport and surface water storm water runoff control.

2.1.15 Quality Engineer

The LMITCO quality engineer provides guidance on work site quality issues when requested. The quality engineer observes work site activities and verifies that work operations comply with quality requirements pertaining to these activities. The quality engineer identifies activities that do not comply or have the potential for not complying with quality requirements and suggests corrective actions.

2.2 Recordkeeping Requirements

2.2.1 Industrial Hygiene and Radiological Monitoring Records

The IH will record air monitoring and personal sampling data on LMITCO IH forms. Industrial hygiene monitoring data are treated as limited access information and are maintained by the IH per *LMITCO Health and Safety Manual*. Any monitoring done by non industrial hygiene safety personnel will be documented in a project controlled logbook, to be reviewed by the IH. The RCT keeps a logbook of all radiological monitoring, daily operational activities, and instrument calibrations. Radiological monitoring records are maintained according to Chapter 7 of the *INEEL Radiological Control Manual*.

2.2.2 FTL Logbook and Site Attendance Logbook

The FTL will keep a record of daily work site events in the FTL logbook. The FTL is also responsible for maintaining an accurate record of all personnel (workers *and* nonworkers) who are on site each day in a site attendance logbook. These logbooks must be obtained from Administrative Record and Document Control (ARDC) and submitted to ARDC along with other documents at the project's completion.

2.2.3 Administrative Record and Document Control Office

The ARDC is responsible for organizing and maintaining data and reports generated by ERP field activities. The ARDC maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of the *Management Plans for the Environmental Restoration Program*, this HASP, the *Quality Program Plan for the Environmental Restoration Program* (QPP-149), the quality project plan, and other documents pertaining to this work are maintained in the project file by the ARDC. All project records and logbooks, except IH and RCT logbooks, must be forwarded to ARDC within 30 days after completion of field activities.

3. PERSONNEL TRAINING

All work site personnel will receive training as specified by OSHA 29 CFR 1910.120 and the *LMITCO Health and Safety Manual*. Radiation worker training shall be in accordance with LMITCO *Radiation Protection Manual* MCP-126, "Radiological Training." Table 1 summarizes training requirements for work site personnel. Specific training requirements for each worker may vary depending on the hazards associated with the job assignment.

Proof of completion of all required training courses (including refresher training) must be maintained on the site at all times. Examples of acceptable written training documents include, LMITCO, "40 Hour OSHA HAZWOPER Card," LMITCO, "Respirator Authorization Card," DOE Certificate of Core Radiological Training I or II Card," "Medic First Aid Training Card," and/or a copy of an individual's or units (LMITCO/Parsons ES only) Training Inquiry System (TIS) printout demonstrating completion of training. A copy of the certificate issued by the institution where the training was received is also acceptable proof of training.

Before beginning work at the work site, a project safety orientation will be conducted by the FTL. The orientation will consist of a complete review of this HASP and attachments, with time for discussion and questions. At this time, personnel training will be checked and verified to be current and complete for all required training shown in Table 1. Upon completing the safety orientation, personnel will sign the training acknowledgment form (Section 12 of this HASP) to indicate that they have received the briefing and understand the HASP. For projects lasting longer than three days, personnel will be monitored by the FTL, or HSO for at least the initial three days of project activities, at which time, upon completion of satisfactory performance, the supervisor will complete the training checklist evaluation and have the worker sign certifying that they have been trained. Copies of the documentation will be retained in the field training records for the project. LMITCO ES training records shall be forwarded to the LMITCO Environmental Operations (EO) training coordinator (MS 3902) for retention in the employee training records.

A daily briefing of the task(s) to be performed that day will be provided by the FTL, HSO, and RCT (applicable); during the briefing the tasks are to be outlined, hazards identified, hazard controls and work zones established, and PPE requirements discussed. After the completion of this briefing, worker's health and safety questions concerning tasks will be addressed and work control documents read and signed [e.g., SWP(s), RWP(s), Hot Work Permit(s)].

Table 1. Required training for work site personnel.

Task/Position	FTL	Field Team	HSO	Specify Others	Nonworkers
Topic	Required	Required	Required	Required	Required
Work site orientation	X	X	X	—	X
Decontamination ^a	X	X	X	—	X ^b
Hazard communication ^a	X	X	X	—	X
Site control and warning devices ^a	X	X	X	—	X
Emergency action plan for work site ^a	X	X	X	—	X
40 hour HAZWOPER ^c	X	X	X	—	—
24 hour HAZWOPER supervised field experience ⁱ	X	—	X	—	—
8 hour HAZWOPER site supervisor	X	—	X	—	—
Hearing conservation	—	—	—	—	X ^d
Radiological worker I and radiological worker II	X ^d	—	—	—	X ^d
Medic First ^e	X	—	X	—	—
MCP-2864	X	X	—	—	—
Respirator qualification and fit test ^f	—	—	—	—	X ^f
MCP-444/MCP-453	X	—	—	—	—
24 hour HAZWOPER occasional worker ^g	—	—	—	—	X
8 hour HAZWOPER supervised field experience	—	—	—	—	X
HAZMAT Employee General Awareness Training	X ^h	—	X ^h	—	X ^h

a. Will be included in work site orientation.

b. If entering contaminated areas.

c. Includes 40 hours of classroom instruction and 24 hours of supervised field experience.

d. As appropriate.

e. Two Medic First qualified individuals must be present during site activities.

f. If entering areas requiring respirator use.

g. Includes 24 hours of classroom instruction and 8 hours of supervised field experience.

h. If identified as "HAZMAT" employee [i.e., anyone who directly affects hazardous material transportation safety by handling, packaging, labeling, loading, unloading, moving, driving, etc. (per 49 CFR 171.8)]

4. OCCUPATIONAL MEDICAL PROGRAM AND SURVEILLANCE

LMITCO and Parsons ES work site personnel shall participate in the INEEL OMP per the requirements of OSHA 29 CFR 1910.120, which requires medical surveillance examinations before assignment, annually, and after termination of hazardous waste duties. This includes employees who are or who may be exposed to hazardous substances at or above published exposure limits, without regard to respirator use, for 30 or more days per year. Employees who must use a respirator in their job or who are required to take training to use a respirator to perform their duties under this plan must be medically evaluated for respirator use at least annually. Job-related information must be provided to the OMP for each hazardous material worker. This information must be submitted to the OMP before work begins. Information furnished to the OMP must be supplemented or updated annually as long as the employee is required to maintain hazardous waste/hazardous material worker medical clearance.

The OMP is responsible for evaluating the physical ability of a worker to perform the work assigned, and providing medical clearance to the worker appropriate for the work to be performed. The OMP may impose restrictions on the employee by limiting the amount or type of work performed.

Areas addressed by the OMP for hazardous waste site workers include:

- Current comprehensive medical examinations in an INEEL medical facility for full-time employees
- Records and reports from employees' private physicians, as required by the site occupational medical director
- Medical evaluation by the OMP on return to work following an absence in excess of 1 work week (40 consecutive work hours) resulting from illness or injury
- Medical evaluation in the event that a supervisor questions the ability of an employee to work
- Medical evaluation in the event that an employee questions their own ability to work.

The information provided on the forms and by employee examination is used to determine the following for each employee:

- Ability to perform relevant occupational tasks
- Ability to work in protective equipment and heat stress environments
- Ability to use respiratory protection

NOTE: If the OMP does not have sufficient information at the time of request for clearance for respirator training, the employee's supervisor will be notified and clearance will be withheld until the needed information is provided and any additional examination or testing is completed.

- Entry into substance-specific medical surveillance programs.

RADCON personnel evaluate the need for medical intervention when an abnormal radiological exposure is suspected based on calculated committed effective dose equivalent values.

4.1 Subcontractor Workers

Subcontractor work site personnel shall participate in their own OMP per the requirements of OSHA 29 CFR 1910.120, which requires medical surveillance examinations before assignment, annually, and after termination of hazardous waste duties.

Medical data from the worker's private physician, collected pursuant to hazardous material worker qualification of a subcontractor worker, shall be made available to the OMP upon request. Also, subcontractor workers' past radiation exposure histories must be submitted to the LMITCO Radiation Dosimetry and Records Dosimetry Unit, per Chapter 2 of the *INEEL Radiological Control Manual*.

4.2 Injuries on the Work Site

It is the policy of the OMP to examine all workers, including subcontractors, if the workers are injured on the job, if they are experiencing symptoms consistent with exposure to a hazardous material, or if there is reason to believe that they have been exposed to toxic substances or physical agents in excess of allowable limits.

In the event of a known or suspected injury or illness due to exposure to a hazardous substance or physical agent, the worker(s) shall be transported to the nearest medical facility for evaluation. As much of the following information as is available will accompany the individual to the medical facility:

- Name, job title, work location, and supervisor's name and phone number
- Substances or physical agents (known or suspected); material safety data sheet (MSDS) if available
- Date of employee's first exposure to the substance or physical agent
- Locations, dates, and results of exposure monitoring
- PPE in use during this work (for example, respirator and cartridge)

- Number of days per month PPE has been in use
- Anticipated future exposure to the substance or agent.

Further medical evaluation will be in accordance with the symptoms, hazard involved, exposure level, and specific medical surveillance requirements.

As soon as possible after an injured person is taken care of, the FTL or designate will perform the notifications as indicated in Section 10.2 of this HASP.

4.3 Substance-Specific Medical Surveillance

No substance-specific medical surveillance requirements apply to personnel working at the TRA PWS and SRPA groundwater monitoring sites. Although the contaminants are known to cause health effects in large concentrated doses, this section has been omitted based on the known concentration of the contaminants at this time and in the foreseeable future

5. SAFE WORK PRACTICES

5.1 General Safe Work Practices

The following are general safe work practices that will be followed at the work site:

1. Do not wear contact lenses in designated eye-hazard areas, unless they are essential to correct a vision defect not correctable by prescription safety glasses. Additional restrictions may apply per the LMITCO *Health and Safety Manual*, MCP-2716, "*Personal Protective Equipment*."
2. ***Absolutely no*** eating, drinking, chewing gum or tobacco, smoking, applying cosmetics, or any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials except in or outside the designated zone(s).
3. Report all broken skin or open wounds to the HSO or FTL. RADCON will determine if the wound presents a significant risk of internal chemical or radiological exposure. RADCON will recommend PPE to be worn by the injured employee. Personnel with unprotected wounds shall not be permitted to enter contamination areas, nor shall they handle contaminated or potentially contaminated materials at the site.
4. Avoid direct contact with potentially contaminated substances. Do not walk through spills or other areas of contamination. Avoid kneeling, leaning, or sitting on equipment or ground that may be contaminated.
5. Be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and broken containers. Report all potentially dangerous situations to the FTL, or HSO.
6. Prevent releases of hazardous materials, including those used at the work site. If a spill occurs, contain it (if possible) and report it to the FTL (and facility representative, where applicable). Steps must then be taken to clean it up in accordance with the appropriate procedure, which may mean activating the emergency preparedness procedures for the area. Appropriate spill kits, or other containment and absorbent materials will be maintained at the work site. See Section 10 of this HASP for more details on the spill response plan for the work site.
7. Avoid splashing during decontamination.
8. Keep all ignition sources at least 50 ft from explosive or flammable environments and use nonsparking, explosion-proof equipment if advised to do so by a safety professional.
9. Be familiar with the physical characteristics of the work site, including, but not limited to:
 - Wind direction
 - Accessibility of fellow workers, equipment, and vehicles
 - Communications at the work site and with other nearby facilities
 - Areas of known or suspected contamination

- Major roads and means of access to and from the work site
 - Nearest water sources and fire fighting equipment
 - Warning devices and alarms
 - Capabilities and location of nearest emergency assistance.
10. If you are working in the exclusion zone, work in teams according to the "buddy system" (see Section 5.3 of this HASP).
 11. Proceed directly to a survey station upon leaving a radiological contamination zone. Care should be taken not to touch the face, mouth, and eyes before a survey has been performed.

Based upon the scope and hazard of the tasks defined by this HASP, new technology concepts have been determined to not add any significant effective controls to the safety control system for this project.

5.2 ALARA Principles

Personnel working at the work site must strive to keep radiation and chemical exposure as low as reasonably achievable (ALARA) through the following practices:

- Radiological and Safe Work Permit compliance
- Radiation and chemical exposure limit awareness
- Adhere to all written radiological and chemical safety requirements and verbal guidance
- Be aware of personal radiation and chemical exposure history
- Work within ALARA guidelines and make suggestions as needed
- Minimize the production of all radioactive and chemical contaminated waste
- Minimize personal radiation and chemical exposure by adhering to these basic protection techniques:
 - **Time**—Exposure is minimized as time is minimized
 - **Distance**—Maintain a maximum distance from the radiation and/or chemical source
 - **Shielding**—Use any solid material (such as lead, steel, or concrete, PPE clothing) as a shield.
 - **Ventilation**—Use to appropriate systems to control airborne exposures.

5.3 The Buddy System

The buddy system will be used at the work site to ensure that each worker's mental and physical well-being is monitored during the course of the day. Work site personnel will be assigned a "buddy" by the FTL to work with and regularly check on during the day. A record of the buddy assignments will be

maintained by the FTL, and updated as necessary. Workers need to be able to see or hear and effectively communicate with their buddy at all times when in the exclusion zone. Everyone should watch for signs and symptoms of illness or injury in their assigned "buddy."

6. SITE CONTROL AND SECURITY

Based on the expected levels of contamination, work activity, worker and co-located worker exposure potential to both radiological and chemical releases anticipated by each work, one or more work zones/radiological areas must be established for the work site. Entry into work site work zones must be controlled through the appropriate use of barriers, signs, and other measures, which must be described in detail in this section. Personnel not directly involved with the activity shall be excluded from entering work zones. Nonworkers, such as inspectors, may be admitted to the work site provided they are on official business, are escorted by the HSO or FTL, and have demonstrated compliance with the training requirements in Section 3.

All zones may not be necessary, depending on the outcome of the hazard analysis (Section 7). Include all appropriate work zones:

- Exclusion zone
- Contamination reduction zone
- Support area.

Posting requirements for radiologically contaminated areas must also be included if such a hazard exists at the work site. The LMITCO *Radiation Protection Manual*, MCP-187, "*Posting Radiological Control Areas*," shall be used for posting and controlling access to radiological controlled areas.

6.1 Exclusion Zone

The exclusion zone includes the immediate work area around the chemical/radiological contamination area. The minimum number of personnel required to safely perform the required operations will be allowed into the exclusion zone.

6.2 Contamination Reduction Zone

The contamination reduction zone is a transition area located between the exclusion zone and the support zone. A designated portion of this zone, called a decontamination corridor, will serve as a decontamination area for equipment and a PPE removal area for work operations personnel. The contamination reduction zone may serve as a staging area for equipment and temporary rest area for workers. Because of the potential for contamination, PPE and sample packaging and preparation equipment should *not* be stored here.

The contamination reduction zone will be established at the work site by the FTL and HSO/IH. A decontamination corridor or area, within the contamination reduction zone, will be designated and marked.

6.3 Support Zone

The support area is the area outside the exclusion zone and the contamination reduction area. It contains the work site command center, vehicle parking, additional equipment staging, and any work site support activities. The support zone will be established at the work site by the FTL and HSO/IH.

6.4 Designated Eating Area

Ingestion of hazardous substances is likely 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. ***No smoking, chewing, eating, or drinking is allowed at the work site***, except in an area that is designated as an eating area. The designated eating area at the work site will be determined by the HSO. This area must be outside the exclusion zone and in a contamination-free (both radiological and chemical) area. Any area designated as an eating area must be regularly checked or surveyed to ensure that it remains contamination-free. A designated eating area may or may not be required, depending on the length of the work and the hazards involved. The designated eating area will be verified "clean" on a daily basis. If the area is found to be contaminated, immediate, appropriate steps will be taken by the FTL or CE to ensure that the area is returned to a clean condition.

7. HAZARD EVALUATION

7.1 Hazard Assessment

Personnel may be exposed to industrial safety hazards, or chemical, radiological and physical agents while working at the work site. The degree of hazard(s) posed to onsite personnel entering the work zones are dependent on both the chemical/radiological nature of the contaminant(s) and the task(s) being performed. Table 2 summarizes each task and the associated hazards. Table 3 contains information about the hazardous chemicals and radiological/radiation exposure components present for this project. The industrial hygiene and radiological hazard monitoring plans are outlined in Sections 7.2.1 and 7.2.2, respectively.

Wastewater discharges have occurred at several locations at TRA, including the warm waste pond, the cold waste pond, an injection well, and a chemical waste pond. Contaminants have percolated downward through the surficial alluvium into the underlying basalt bedrock. The ROD for the Perched Water System was signed in December 1992 and mandated that no remedial action was required; however, monitoring of the system is necessary. The groundwater samples collected recently (January 1997) indicate the presence of chromium, above the Federal limits for groundwater in the Perched Water System. Radionuclides (e.g. tritium and Strontium-90) are also present in the Perched Water System. The Snake River Plain Aquifer (SRPA) groundwater sampling in this area has shown the presence of chromium and tritium.

The radiological hazards, as listed above, are not in sufficient quantities to pose a significant health risk to employees. Work site activities involving known or potential radiological hazards have been evaluated according to Chapter 3 of the INEEL Radiological Control Manual. Although the radiological contaminants present in the perched water are insufficient to warrant an RWP, an RWP may be required depending on the work areas that site personnel may be working in. If necessary, an RWP in accordance with LMITCO Radiation Protection manual, MCP-7, "Radiological Work Permits" will be issued.

Table 2. Work site activities and associated hazards.

Activity or Task	Associated Hazards or Hazardous Agents
Deep PWS groundwater sampling	Radionuclides, chromium, slips, trips, falls, heat/cold, stress, noise, pushing, pulling, bending, twisting
SRPA groundwater sampling	Radionuclides, chromium, slips, trips, falls, heat/cold, stress, noise, pushing, pulling, bending, twisting
Groundwater elevation studies	Radionuclides, chromium, slips, trips, falls, heat/cold, stress, noise, pushing, pulling, bending, twisting

Table 3. Hazardous (including radiological) materials and radiation fields present at the TRA deep PWS and the SRPA.

Hazardous Material/CAS Number	Exposure Limit (PEL/TLV/REL)	Routes of Exposure ^b	Symptoms of Overexposure ^c	Target Organs/Systems	Carcinogen (source) ^d	Expected Levels of Exposure ^e
Arsenic/ 7740-38-2	0.2 mg/m ³ TWA	Inh, Abs, Con, Ing	DERM, RESP, NS	Liver, kidneys, skin, lung, lym. sys.	Yes	Low
Beryllium/ 7740-41-7	0.0022 mg/m ³	Inh	RESP	Lung, skin, eyes, mucous mem.	Yes	Low
Cadmium/ 7740-43-9	0.05 mg/m ³	Inh, Ing	RESP, NS	Resp. sys., kidneys, blood	No	Low
Chromium/ 7740-47-3	0.05 mg/m ³	Inh, Ing	RESP	Resp. Sys.	No	Low
Cobalt/ 7740-47-3	0.05 mg/m ³	Inh, Ing, Abs	RESP, DERM	Resp. Sys.,	Yes	Low
Lead/ 7439-92-1	0.15 mg/m ³	Inh, Ing, Abs	NS	GI tract, CNS, kidneys, blood, gingival tissue	Yes	Low
Manganese/ 7439-96-5	5 mg/m ³	Inh, Ing	RESP, NS	Resp. Sys, CNS, blood, kidneys	No	Low
Fluoride/ 16984-48-8	2.5 mg/m ³	Inh, Ing, Abs	RESP, NS, DERM	Eyes, Resp Sys CNS, skeleton, kidneys, skin	No	Low
Cobalt-60 ^f	5,000 pCi/L ^g	Ing, Direct ^h	None ⁱ	GI Tract	Yes	Low
Cesium-137 ^f	3,000 pCi/L ^g	Ing, Direct ^h	None ⁱ	Whole body	Yes	Low
Americium-241 ^f	30 pCi/L ^g	Ing, Direct ^h	None ⁱ	Bone surface, red bone marrow, liver	Yes	Low
Strontium-90 ^f	1,000 pCi/L ^g	Ing, Direct ^h	None ⁱ	Bone surface, red bone marrow, GI tract	Yes	Low
Tritium ^f	2 × 10 ⁶ pCi/L ^g	Ing	None ⁱ	Whole body	Yes	Low

- a. CNS = central nervous system
 PEL = permissible exposure limit
 REL = recommended exposure limit
 TLV = threshold limit value

b. (Inh) Inhalation; (Ing) Ingestion; (Abs) Skin absorption; (Con) Skin or eye contact

c. (NS) Dizziness/nausea/lightheaded; (DERM) Rashes/itching/redness; (RESP) Respiratory effects; (EYES) Tearing/irritation; (O) Other symptoms - must be specified.

d. If yes, identify agency and appropriate designation (ACGIH A1 or A2; NIOSH; OSHA; IARC; NTP).

e. These concentrations represent environment groundwater concentrations (deep PWS mean concentrations). Airborne concentrations are not expected to exceed the exposure limit.

f. Radionuclides do not have CAS numbers

g. Derived concentration guides for the public (DOE 5400.5, Chapter III)

h. Direct exposure minimal at expected concentrations and not further considered

i. No acute health effects expected at these concentrations.

7.2 Environmental and Personnel Monitoring

Personnel working at the work site may be exposed to hazardous materials or hazardous physical agents, as previously described. Industrial safety hazards and other physical hazards will be monitored and controlled as outlined in Section 7.3. Specific hazardous agent exposures that will be monitored are indicated in Table 4.

7.2.1 Industrial Hygiene Monitoring

Table 5 contains a list of equipment that may be used by the IH to monitor chemical (non radiological) and physical agents. All industrial hygiene equipment will be maintained by the IH per the manufacturer's recommendations. Instruments will be calibrated per manufacturer's recommendations, or according to the schedule outlined in the LMITCO Health and Safety Manual.

It is anticipated that IH concerns associated with this job will be minimal. IH support for this job will be on an as needed basis. Work site personnel will notify the IH if they notice any unusual odors. Metal contaminants are contained in a water matrix and should not pose a threat to site personnel. Every effort should be made by site personnel to keep dust levels minimal due to the fact that surface soils surround the work area may contain metals. It is anticipated that work activities will be non-strenuous and therefore heat stress is a minor concern. If elevated heat should become a concern, an IH evaluation will be requested by the FTL.

If air sampling is performed by the IH, it will be done using NIOSH methods and according to the LMITCO Health and Safety Manual. Sampling frequency and type of sampling will be determined by the IH. The number frequency and sampling techniques will depend on the IH's assessment of potential exposures and a risk assessment for work site personnel in accordance with the LMITCO Health and Safety Manual.

Sampling data, results from direct-reading instruments, and field observations will be recorded as per Section 2.2.1 of this HASP. The FTL shall record the four-digit number printed at the upper right-hand corner of the IH monitoring data form which corresponds to the day's industrial hygiene monitoring.

7.2.2 Radiological Monitoring

There is no known radioactive contamination at the work site. Additional surveys, smears, and other sampling will be performed if necessary by the RCT at the work site. Appropriate survey equipment will be used by the RCT to verify boundaries and work zones, survey personnel and equipment before leaving the work site, and verify that waste items are sent to the appropriate disposal facility. Monitoring will be performed in accordance with the *INEEL Radiological Control Manual* as implemented in the LMITCO *Radiation Protection Manual* MCP's.

Table 4. Contaminants to be monitored.

Task or Assignment	Contaminant or Agent to be Monitored
Groundwater sampling	Radionuclide contamination
Groundwater elevations	Radionuclide contamination

Table 5. Equipment to be used for monitoring:

Equipment	Agent to be Monitored
Portable radiation survey equipment	Alpha, beta, and gamma radiation
Heat stress monitor (wet bulb globe temperature)	Heat stress conditions
PID and/or FID	VOCs
Passive badges and/or pump w/activated carbon tube	VOCs
Sound level meter	Noise
Sampling pump with filter	Dust and metals

The RCT will be responsible for radiological monitoring in accordance with the LMITCO *Radiation Protection Manual*, MCP-139, "*Radiological Surveys*." All health physics equipment will be maintained and calibrated in accordance with MCP-93, "*Health Physics Instrumentation*." Dosimetry monitoring shall be as determined by the RWP and performed in accordance with MCP-3, "*Tracking Radiation Exposure with Dose Cards*." Where required, as determined by RADCON analysis per MCP-352, "*Conducting Airborne Hazard Analysis*," airborne radioactivity sampling will be performed in accordance with MCP-357, "*Job-Specific Air Sampling/Monitoring*."

7.2.3 Action Levels

To ensure worker safety at the work site, action levels have been set by LMITCO IH and RADCON engineer. If levels of these contaminants reach the action level(s) noted in Table 6, the corresponding action will be taken at the work site.

Table 6. Action levels for the work site.

Agent Name and Monitoring Method	Action Level	Action Taken
Organic vapors (PID)	5 ppm in breathing zone, sustained for 2 minutes	Stop work; additional IH monitoring; upgrade PPE at IH direction.
Heat stress	See Section 7.3.1	See Section 7.3.1
Noise	8-hr Time Weighted Average >85dBA	Wear hearing protection.
Beta/gamma emitting radionuclides	Contamination (removable) > 1,000 disintegrations per minute per 100 cm ² beta/gamma	Perform spectral analysis of swipe. Post and control area/location as appropriate.
Alpha-emitting radionuclides	Contamination (removable) > 20 disintegrations per minute per 100 cm ² alpha	Perform spectral analysis of swipe. Post and control area/location as appropriate.
Radioactivity (dose rate)	> 60 μ rem/hr	Upgrade zone to "Soil Contamination Area;" cease work; obtain RWP; have RCT evaluate PPE and dust control.
Radiation levels	> 5 mrem/hr	Upgrade zone to "Radiation Area;" cease work; RCT evaluate dosimetry.
Airborne radioactivity	> 10% of Derived Air Concentration	Perform an evaluation to determine the need for respirators.
Alpha, beta/gamma emitting radionuclides	<p>a. Facial or nasal contamination is detected that indicates a potential for internal contamination.</p> <p>b. Airborne monitoring indicates the potential for intakes exceeding 100 mrem committed effective dose equivalent.</p> <p>c. Upon direction of the Radiological Control Organization when an intake is suspected.</p>	<ul style="list-style-type: none"> • Whole body count and/or in-vitro bioassay. • Modify work environment via alteration of Administrative and Engineering controls.

7.3 Physical Hazards Evaluation, Control, and Monitoring

The physical hazards present at the work site, and the methods that will be used to monitor and control them, are described in the following paragraphs.

The FTL will conduct daily inspections of the task site to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the site. Health and safety professionals present at the task site may, at any time, recommend changes in work habits to the FTL.

Individuals working at the task site are responsible for using safe work techniques, reporting unsafe working conditions, and exercising good personal hygiene and housekeeping habits throughout the course of their job.

7.3.1 Temperature Extremes

Heat Stress. Workers may be required to work outdoors during summer months and/or wear protective clothing that prevents the body from cooling. High body temperatures can result in heat fatigue, physical discomfort, and death. Personnel must inform the FTL or HSO if they experience any of the signs and symptoms of heat stress or observe that their work buddy is experiencing these symptoms. *LMITCO Health and Safety Manual*, MCP-2704, "Heat and Cold Stress" discusses the hazards of heat stress.

Monitoring for heat stress conditions shall be performed according to the *LMITCO Health and Safety Manual*, MCP-2704, "Heat and Cold Stress." Depending on the ambient weather conditions, work conditions, and physical response of work operations personnel, the IH will inform the FTL of necessary adjustments to the work/rest cycle. A supply of cool drinking water will be provided at the work site and consumed only in the designated eating area.

Workers may be periodically interviewed by the IH or HSO to ensure that the controls are effective and that excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and to take a break if symptoms of heat stress occur. The signs of heat stress are:

- Clammy skin
- Dizziness or nausea
- Fatigue
- Profuse sweating
- Skin color change
- Vision problems.

Individuals showing any of the symptoms listed above will stop work, move to a shaded area to rest, be provided cool drinking water, and be monitored by a Medic First qualified person. If personnel exhibiting symptoms of heat stress do not show signs of immediate recovery when removed to the rest area, they will be transported to the dispensary for medical attention.

Heat stroke is an extremely serious condition that can result in death and should be treated as such. *An individual who stops sweating, or who shows symptoms of confusion, slurred speech, or any other evidence of change in level of consciousness, will be transported IMMEDIATELY to the nearest medical facility for evaluation.*

Cold Stress. Exposure to low temperatures may be a factor if work is done in the winter months, or at any time of year if the conditions are right. Relatively cool ambient temperatures, and wet or windy conditions increase the potential for cold injury to personnel. The *LMITCO Health and Safety Manual MCP-2704* discusses the hazards of cold stress. Cold stress conditions will be monitored in accordance with *LMITCO Health and Safety Manual MCP-2704*.

7.3.2 Noise

Personnel working at the work site may be exposed to noise levels in excess of 85 dBA during. Noise monitoring will be performed by the IH per the *LMITCO Health and Safety Manual, MCP-2719, "Hearing Conservation Program"* to determine if persons assigned to the jobs identified above are exposed to noise above the allowable 8-hour time-weighted average of 85 dBA. Persons whose exposure meets or exceeds the allowable level will be enrolled in the INEEL or subcontractor OMP Hearing Conservation Program. Personnel working on jobs that are noisy will be required to wear hearing protection until the noise levels have been evaluated, and will continue to wear the hearing protection specified by the IH until directed otherwise.

7.3.3 Fire and Explosion Hazards

Flammable and combustible liquids will be handled per *LMITCO Health and Safety Manual MCP-584, "Flammable and Combustible Liquid Storage and Handling."*

7.3.4 Confined Spaces

Work in confined spaces may subject workers to risks involving engulfment, entrapment, oxygen deficiency, and toxic or explosive atmospheres. There are no confined spaces present at the work site.

7.3.5 Industrial Safety Hazards

During drilling operations, handling, and maneuvering of drilling cases, auger flights, and various other pieces of equipment may result in personal injury. Manual material handling will be minimized through task design and use of mechanical and hydraulic lifts whenever possible.

Sampling personnel may be exposed to injury by lifting heavy objects such as the power auger, shipping coolers, and water carboys. Personal injury can also occur during manual soil sampling. Proper insertion and removal of sampling tubes will be discussed with the team during the prejob briefing and as necessary during the job task.

All operations personnel are therefore cautioned against lifting objects that are too heavy. Mechanical and hydraulic assists will be used whenever possible to minimize lifting dangers. Field team

members will be trained in the proper methods of lifting heavy objects and cautioned against lifting objects that are too heavy for the individual to handle safely. In addition, the FTL or HSO will periodically review the basics of safe lifting in the daily safety briefings.

People involved in manual material handling will wear hand protection (i.e., leather gloves) as directed by the FTL.

7.3.6 Sampling Equipment

All power tools will be properly maintained and used by qualified individuals in a safe manner and in accordance with the manufacturer's recommendations. The LMITCO *Health and Safety Manual* will be followed for all work performed with power tools including powered hand augers. No gas or diesel powered tool will be refueled while running. Employees who use powered hand augers shall be trained in their use, wear appropriate PPE, and stop working with the auger if there is a question regarding its safe use.

7.3.7 Moving Machinery and Falling Objects

Work site personnel may be subject to cuts and bruises, or get caught in moving machinery during certain work site activities. Injuries will be avoided or minimized by following safe practices for operation of machinery; ensuring that guards are maintained in place; wearing gloves, eye protection, hard hats, and steel-toed boots; and using mechanical assists whenever possible. Loose clothing or neck chains for security badges will not be worn; long hair must be pulled back and secured when working around equipment with moving parts.

Electrical Hazards, Energized Systems. Electrical equipment and tools as well as overhead and underground lines may pose shock or electrocution hazards to employees. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. These practices will conform with the requirements in 29 CFR 1910, Subpart S; 29 CFR 1926, Subpart K; and the LMITCO *Health and Safety Manual*, MCP-2731, "*Electrical Safety*" and LMITCO *Operations Manual*, MCP-1059, "*Lockouts and Tagouts*" and facility supplemental MCPs. In addition all electrical work will be reviewed and completed under the appropriate work controls [i.e., HASPs, SWPs, Work Orders]. When working on deenergized systems, the requirements in LMITCO *Health and Safety Manual* MCP-2731 will be followed.

Work on energized systems will be minimized. If work on energized systems is necessary, the requirements in the LMITCO *Health and Safety Manual* MCP-2731 will be strictly enforced. There shall be a qualified electrical backup present whenever work on energized systems is done.

Portable electrical tools and equipment also have the potential to cause shock or electrocution. Portable electrical tools will be ground fault circuit interruption (GFCI) protected and approved for use if operated in hazardous areas. All equipment and cords will be visually inspected before use. In addition, all portable electrical tools shall be included in the semiannual inspection and testing program. The requirements in the LMITCO *Health and Safety Manual*, MCP-2735, "*Hand and Portable Power Tools*," will be followed for all work using portable electrical tools or equipment.

Overhead power lines, downed electrical wires, and buried cables pose shock or electrocution hazards. Overhead electrical hazards will be identified by operating personnel before raising masts on drill rigs or using cranes. Minimum distances for working near overhead power lines, found in DOE Handbook-Hoisting and Rigging, will be followed. The requirements in the *LMITCO Health and Safety Manual* MCP-2731 will be followed for all work performed near overhead lines. In addition, durable signs will be placed at the operator's station and on the outside of the drill rigs and cranes warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 ft is maintained between the drill rig and/or crane and energized power lines. If local jurisdiction has more restrictive requirements, then that clearance distance shall be marked on the signs.

Before beginning drilling or excavating operations, underground utility clearances will be obtained by contacting Telecommunications (526-1688 or 526-2512). Subsurface investigation clearance will be obtained in accordance with MCP-151 "*Subsurface Investigations*." The requirements for advanced notice of 48 hours will be met.

Energized systems, regardless of energy source, involve hazards associated with transfer of energy. Work on energized systems shall be performed under energy controlled conditions utilizing the *LMITCO Conduct of Operations Manual*, MCP-1059, "*Lockouts and Tagouts*."

Heavy Equipment. The hazards associated with the operation of heavy equipment include injury to personnel, equipment damage, and/or property damage. All heavy equipment will be used in the manner in which it was attended. Drivers will operate all equipment in accordance with manufacturer's instructions and within the safe operating parameters as defined by the manufacturer. Only required personnel will be allowed in the vicinity of operating heavy equipment and should maintain visual communication with the operator.

Personal Protective Equipment. Wearing PPE will reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Work activities at the work site will be modified as necessary to ensure that personnel are able to work safely in the required PPE.

Elevated Work Areas. When performing certain work site activities (see Table 2), personnel will be required to work on elevated equipment or at heights. When such work is performed, personnel will use a safety harness and lanyard (for work heights exceeding 6 ft) or a safety net (for work at heights exceeding 25 ft) per the *LMITCO Health and Safety Manual*. Personnel required to use fall-protection PPE shall be trained in its proper use, limitations, and how to maintain and inspect the equipment.

Decontamination. The chemical and radiological decontamination processes used to remove contaminants from tools, equipment, and work site personnel can spread contamination and increase the risk of exposure if decontamination activities are not performed according to procedures. High pressure, hot water and steam, if used in the process, can present a hazard if it rebounds into the face or onto the body of personnel, and contaminants may become airborne from this process. Decontamination procedures must be followed and appropriate PPE must be used during decontamination activities.

Inclement Weather. In the event that adverse weather conditions develop that pose a threat to persons or property on the work site, such as sustained strong winds (25 mph or greater), electrical storms, heavy precipitation, or extreme heat or cold. The situation will be evaluated by the FTL with input from the HSO, IH, safety engineer, RCT, and other personnel, as appropriate. A decision to stop all work at the work site will be made by the FTL with input from the HSO, IH, and RCT based on the hazards involved and the situation. In some cases, work at the site may proceed provided that workers are afforded adequate, appropriate protection. At no time will individual health and safety be jeopardized in order to continue work.

7.4 Other Work Site Hazards

Work site personnel should look for potential hazards and immediately inform the FTL or HSO of the hazards so that action can be taken to correct the condition.

The FTL will conduct daily inspections to the work site to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the site. These inspections will be noted in the FTL logbook. Health and safety professionals present at the work site may, at any time, recommend changes in work habits to the FTL.

Individuals working at the work site 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.

8. PERSONAL PROTECTIVE EQUIPMENT

PPE that will be used at the work site is selected based on the toxicity, route of entry, physical form of contaminant, and anticipated levels of known or suspected hazardous materials and agents (including radiological hazards) at the work site, recommendations contained in NIOSH (1985), and on the hazard analysis in Section 7 of this HASP. A list of the PPE that is required follows:

Other items to consider for any level of PPE include, but are not limited to:

- Hard hat
- Hearing protection
- Leather gloves
- Long-sleeved coveralls
- Cold weather gear (hat, heavy coat, insulated gloves, and boots).

Other items may be specified depending on the task and hazards involved.

8.1 Level D Personal Protective Equipment

Level D PPE affords little protection against chemical hazards and is appropriate for use at the work site when personnel are not expected to be exposed to hazardous chemicals above an allowable limit and no danger exists due to absorption of chemicals through the skin. Level D is basically a standard work uniform. This level of PPE at the work site consists of:

- Coveralls (Tyvek or surgical) or street clothes (as determined by the IH, RADCON)
- Hard hat (as required by safety engineer)
- Eye protection (see LMITCO *Health and Safety Manual* MCP-2716)
- Safety footwear (Steel or protective toe and shank)
- Any chemical or radiological protective clothing prescribed in task-specific RWP or Safe Work Permit.

9. DECONTAMINATION PROCEDURES

9.1 Decontamination of Personnel and Equipment

Radiological decontamination of personnel shall be done under the direct supervision of LMITCO RADCON (radiological engineer or RCT) in accordance with Chapter 5 of the LMITCO *INEEL Radiological Control Manual*. Chemical decontamination of personnel shall be done under the direct supervision of LMITCO industrial hygiene personnel. Personnel and personal property decontamination procedures that may be used include: tape, vacuuming (vacuum must be equipped with a high-efficiency particulate air filter), washing with soap and water, or other approved techniques. All radiological decontamination operations for equipment and areas shall be performed in accordance with the applicable MCP designated in the LMITCO *Radiation Protection Manual*.

9.1.1 Decontamination in Medical Emergencies

If a person is injured or becomes ill, the situation will be evaluated by first aid personnel on the work site. Emergency care will be initiated and emergency preparedness procedures for the facility at which the work is being performed will be activated. ***Medical care for serious injury or illness will not be delayed for decontamination.*** In such cases, gross contamination may be removed by removing the injured person's outer protective gear (if possible). Additional decontamination may be performed at the medical facility. The IH or RCT (depending on the type of contamination) should accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Chapter 5 of the LMITCO *INEEL Radiological Control Manual* contains information on proper handling of radiologically contaminated wounds.

9.1.2 Equipment Decontamination and Disposal of Contaminated Materials

LMITCO ER Program Directives PD 11.5, "*Decontamination of Sampling Equipment*" will govern equipment decontamination per the "Post Record of Decision Field Sampling Plan."

Waste that may require disposal, includes PPE (i.e. gloves), samples, and decontamination and purge water, generated during the sample process. PPE will be surveyed for radiation and disposed appropriately (i.e., in a "hot" or "cold" waste receptacle), unused sample will be neutralized as appropriate and disposed to a TRA warm drain, and purge water will be disposed in the TRA evaporation pond.

9.1.3 Site Sanitation and Waste Minimization

Work site personnel will use toilet facilities located at TRA. Potable water and soap will also be available at the site for personnel to wash their hands and face upon exiting the work area. It is important to note that any required radiological contamination surveys must be performed ***before*** washing face and hands to prevent accidental spread of contamination.

Waste materials will not be allowed to accumulate at the work site. Appropriate containers for contaminated and noncontaminated waste will be maintained at step-off areas, in the support zone, and at other appropriate locations at the work site. All waste will be surveyed by the RCT before removal from

the work site. Personnel should make every attempt to minimize waste through judicious use of consumable materials. All work site personnel are expected to make good housekeeping a priority at the job site.

10. EMERGENCY RESPONSE PLAN FOR WORK SITE

Response to emergencies at the work site will be coordinated between the FTL, IH, and HSO. In emergencies that require immediate evacuation, such as fires, explosions, or other catastrophic events, personnel at the site will be notified by the FTL or designee by radio or using the horns on vehicles at the site. Personnel inside the exclusion zone will be immediately informed by a person outside of the zone and will evacuate at once. Decontamination will be secondary to evacuating the site in a timely fashion. All personnel will meet in the support zone and await instructions from the FTL or designee. In site emergencies, the FTL is responsible for calling the Warning Communications Center. If the emergency is for the INEEL or TRA, personnel will follow the INEEL emergency plan/RCRA contingency plan and the emergency action procedure for TRA.

10.1 TRA Emergency Action Procedures

Refer to the shaded portions in Figure 4 for locations of emergency facilities and staging areas discussed in the following sections. The closest medical facility is the TRA medical dispensary (TRA-667). Personnel working outside the TRA fence must enter TRA through the main guard gate (see Figure 4) to access all emergency take-cover/medical facilities.

10.1.1 Steady Siren

If a steady siren from TRA sounds, personnel are to take cover in the designated take-cover areas within TRA; the Materials Test Reactor (MTR) basements are the preferred location (TRA 603/604). Personnel at the site are to immediately report to the FTL. Evacuation to the TRA guard gate will proceed in as few vehicles as practicable. After arriving at TRA, personnel will proceed to the take-cover locations as directed by the security guard at the main guard gate. When traveling to the TRA facility and once inside the facility, personnel should pay close attention to the environment around them and avoid any hazardous areas.

10.1.2 Alternating Siren

The alternating siren at TRA indicates that personnel must evacuate the facility. Personnel located either inside or outside the fence are to check the direction lights located on the MTR and Engineering Test Reactor building roof tops (see Figure 4). An "S" indicates the evacuation is to the primary south staging area located near the from of the TRA main guard gate where the buses load and unload; an "E" indicates the alternate east staging area located outside the east perimeter fence. If an "S" is shown on the rooftops, personnel will report to the FTL and evacuation will proceed to the staging area in as few vehicles as practicable. Once at the staging area, personnel will line up at the sign marked "VISITORS AND OTHERS" while waiting for the evacuation buses. If an "E" is shown on the rooftops, personnel are to report to the east staging area and line up at the sign marked "VISITORS AND OTHERS" while waiting for the evacuation buses. If personnel at the staging area have questions, they should seek out an area warden (wearing a green hat), or the staging area coordinator (wearing an orange hat).

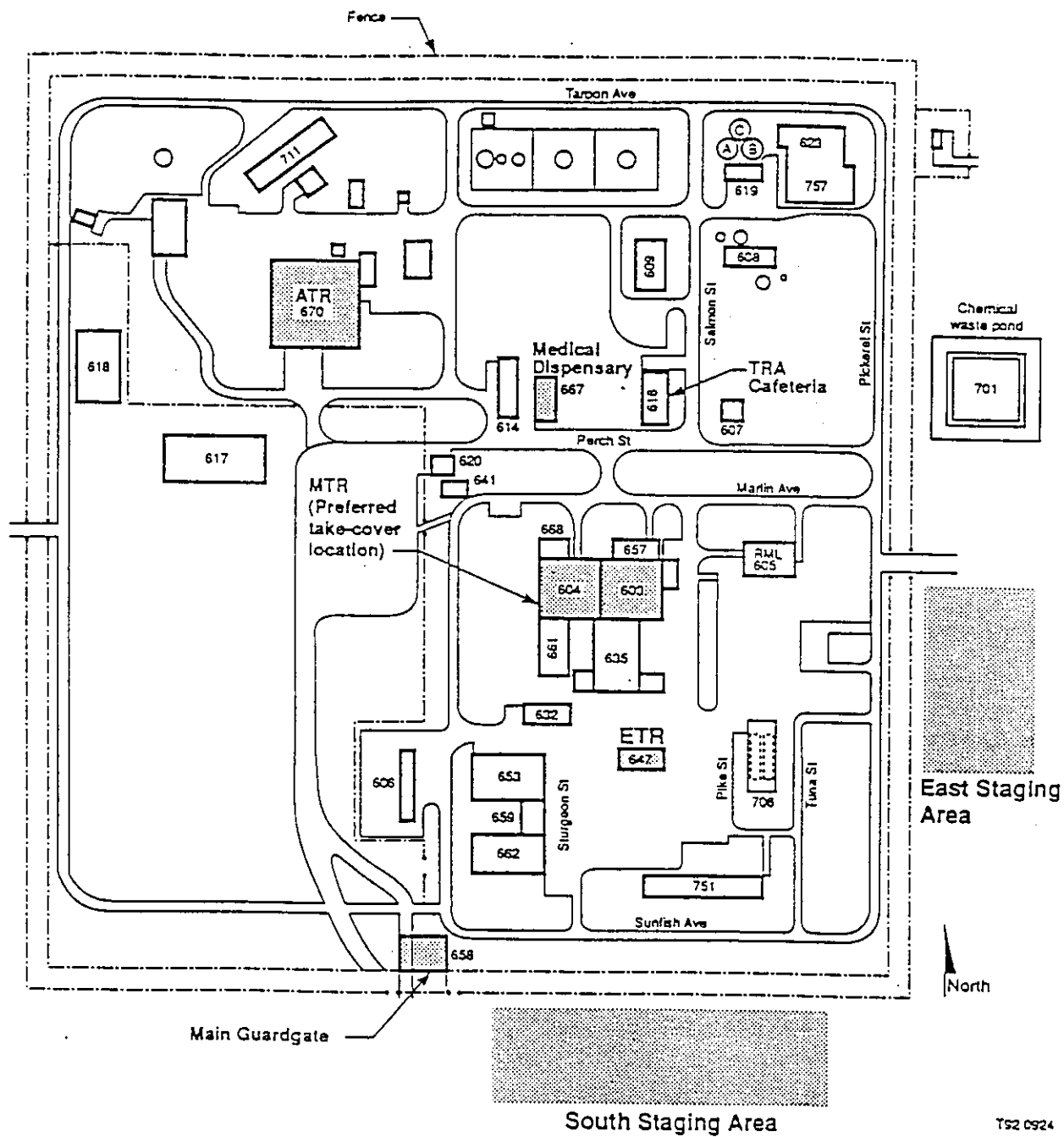


Figure 4. Locations of emergency facilities and staging areas.

Changes to these evacuation procedures, if required because of relocation of the evacuation buses in the east staging area, will be communicated to all task workers before beginning work.

Responsibilities at the work site during an emergency event are as provided in Table 7.

At least two persons with current Medic First training will be present at the work site to render first aid assistance to victims in an emergency.

Spill control at the work site will be handled by work site personnel if the spills are small enough to be safely contained at the site. Radiological contamination in uncontrolled areas is considered a "spill." If any uncontrolled release of hazardous or radioactive material is noticed, work site personnel shall comply with the following:

Immediate Spill Response Actions

Initial Responder If you do not know the material's characteristics:

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

Trained Responder If you are trained to respond to the hazard:

- **Seek help** from and **warn** others in the area
- **Stop** the spill, if it can be done without risk (e.g., return the container to upright position, close valve, shut off power, etc.)
- **Provide** pertinent information to FTL and HSO
- **Secure** any ventilation paths and ensure that an appropriate PPE level protected RCT, IH surveys the area to determine the extent of a radiological, chemical material spill.

The Environmental Compliance spill response categorization/notification team must be contacted immediately via pager #6400.

10.2 Emergency Equipment on the Site

Emergency response equipment that will be maintained at the site includes the items described in Table 8.

The INEEL Fire Department has a mutual aid agreement with the Idaho Falls, Blackfoot, and Arco Fire Departments.

An emergency drill will be conducted by the FTL at the beginning of the project.

Table 7. Responsibilities during an emergency.

Responsible Person	Action Assigned
LMITCO HSO	Signal evacuation
LMITCO HSO	Contact Safety/IH/RCT
LMITCO HSO	Call Warning Communication Center (WCC)
Task site personnel	First aid to victims
LMITCO HSO	Contact area emergency action
LMITCO HSO	Contact OMP
Task site personnel	Spill containment
LMITCO HSO	Spill reporting

Table 8. Emergency response equipment to be maintained at the work site.

Equipment Name and Quantity Required	Location at Work Site	Responsible Person	Frequency of Inspection
Fire extinguishers - (1) 8-lb ABC fire extinguisher	Vehicle	FTL	Monthly
First aid kit	Vehicle	FTL	Monthly and after each use
Eyewash station	Support zone	FTL	Weekly
Hazardous materials spill kit	Support zone	FTL	Weekly
F-NET radio	Vehicle	FTL	Weekly
Extra PPE	Support zone	FTL	As required

Figure 4 shows the route to the nearest medical facility and locations of the nearby emergency response teams and the location of take cover stations and facility evacuation routes and pickup locations.

An emergency drill will be conducted at the beginning of the work. The objective of the drill is to allow work site personnel an opportunity to practice their respective emergency response actions. *Any radio or telephone communications that are included in this drill shall be immediately preceded and*

followed with a statement that clearly identifies the situation as a drill to prevent an actual emergency response from being initiated by WCC. Additional drills will be conducted if activities at the work site continue for more than 12 months.

Each drill or actual emergency event at the work site will be followed by a critique and any deficiencies in the emergency plan that are identified will be corrected.

10.3 Telephone/Radio Contact Reference List for TRA Perched Water System Monitoring

This reference list will be posted at the work site.

- Warning Communications Center (WCC) 777, 526-1515
Radio: KID-240
- Area emergency action coordinator (TRA) 526-4438
- First Aid (CFA Dispensary, CF-1612) 777, 526-2356
- Occupational Medical Program (CFA Dispensary) 526-1596
- Fire/Security 777
- LMITCO facility manager/Landlord 526-4423
K. M. Spencer Pager #6-7327
- LMITCO project manager 526-9367
P. J. Jessmore
- Field Team Leader, LMITCO 526-8630
J. Lord
- LMITCO ER ES&H Manager 526-8590
Roger Jones Pager #6519
- LMITCO Safety Supervisor 526-6562
Jim Durrant Pager #5747
- LMITCO Industrial Hygiene Technical Lead 526-3233
Jim Downes Pager #5514
- LMITCO Radiological Control (TRA) 533-4141
Supervisor Pager #6-5295
- LMITCO EO Env. Support Supervisor 526-8205
Bob MacFarlane Pager #5712

This reference list will be posted at each support zone and at the offices of those assigned notification responsibilities.

ACTIVITY		TITLE	PHONE	PAGER	RADIO
RESPONSIBLE PERSON	FIELD TEAM LEADER				
Notifies	Fire Department		777	n/a	KOK 230
Notifies	Warning Communication Center (WCC)		526-1515	n/a	KID 240
Notifies	Emergency action coordinator		526-4438	-	-
Notifies	In case of a spill: Env. Compliance Spill Team		----	6400	n/a
Notifies	LMITCO (ER) ES&H manager		526-8590	6519	-
Notifies	LMITCO EO S&H Supervisor		526-6562	5747	n/a
Notifies	LMITCO project manager		526-9420	5846	-
RESPONSIBLE PERSON	LMITCO PROJECT MANAGER		-	-	-
Notifies	(Facility) Manager/Landlord		533-4423	7327	-
Notifies	(Facility) DOE Facility Representative		533-4982	6876	-
Notifies	LMITCO ER ES&H manager		526-8590	6519	n/a
Notifies	LMITCO project manager/department manager		526-9420	5846	-
RESPONSIBLE PERSON	LMITCO DEPARTMENT MANAGER		-	-	-
Notifies	LMITCO ER Director		526-1559	5013	n/a

11. REFERENCES

Conduct of Operations Manual, LMITCO, Inc., current issue.

DOE Handbook - Hoisting and Rigging.

Environmental Management Control Procedures, LMITCO, Inc., current issue.

Health and Safety Manual, LMITCO, Inc., current issue.

INEEL Emergency Plan/RCRA Contingency Plan, LMITCO, current issue.

INEEL Radiological Control Manual, LMITCO, current issue.

Management Plans for the LMITCO Environmental Restoration Program, LMITCO, Inc., current issue.

NIOSH, 1985, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH/OSHA/USCG/EPA, DHHS (NIOSH) Publication No. 85-115, October.

Peatross, R. G., 1996, *Hazard Classification of Environmental Restoration Activities at the INEL*, March.

Quality Program Plan for the Environmental Restoration Program, QPP-149, LMITCO, Inc., current issue.

Radiological Control: Subject Area Manual, LMITCO, Inc., current issue

12. HEALTH AND SAFETY PLAN TRAINING ACKNOWLEDGMENT

The signatures below certify that:

- The employee has reviewed a copy of the HASP for TRA Perched Water System Operable Unit 2-12 and questions and concerns regarding tasks and associated hazards have been answered to the employee's satisfaction
- The employee understands the hazards that are or may be involved in work at the TRA Perched Water System Operable Unit 2-12 site (Section 7, "Hazard Evaluation, "Table 2 Work Activities and associated hazards
- The employee agrees to comply with all requirements as outlined in this HASP
- The employee's training records have been verified as complete and current for the employee's assignment at the work site.

Health and Safety Officer's name (printed) and signature:

Print	Signature	Org.	Date
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Field Team Leader's name (printed) and signature:

Print	Signature	Org.	Date
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Employee's name (printed) and signature:

Print	Signature	Org.	Date
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13. HAZWOPER 24 HOUR SUPERVISED FIELD EXPERIENCE ACKNOWLEDGMENT

This checklist is to be completed for each HAZWOPER worker performing field tasks lasting longer than three working days. The checklist is to be completed by the immediate field supervisor based upon his observations and worker refresher training during daily Plan of the Days meetings. For LMITCO and Parsons ES employees, the signed form is to be submitted to the LMITCO EO Training Coordinator at MS 3902 and a copy retained in the field project files.

Project: TRA Perched Water System Operable Unit 2-12

- ☐ Knowledge of names of personnel and alternates responsible for project safety and health.
- ☐ Knowledge of safety, health hazards at the work site and co-located facilities.
- ☐ Knowledge of personal protective equipment requirements.
- ☐ Knowledge of operating/maintenance procedures and safe work practices.
- ☐ Knowledge of hazard control.
- ☐ Knowledge of medical surveillance requirements, including recognition of signs and symptoms which may indicate overexposure to hazards.
- ☐ Knowledge of decontamination procedures.
- ☐ Knowledge of work site and facility emergency response procedures.
- ☐ Knowledge of emergency signals, take cover areas and evacuation routes.
- ☐ Knowledge of spill containment and waste management/minimization procedures.
- ☐ Knowledge of work site access controls and posting.
- ☐ Knowledge of location of first aid kits, eye wash stations, fire extinguishers and energized system controls.

Trainee Date

Supervisor Date