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Stationary Low-Power Reactor-1 and Boiling Water Reactor Experiment-I Burial Grounds Engineered Barriers Health and Safety Plan Operable Units 5-05/6-01

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Stationary Low-Power Reactor-1
Boiling Water Reactor Experiment-I
Burial Grounds Engineered Barriers
Health and Safety Plan
Operable Units 5-05/6-01

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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 Stationary Low-Power Reactor-1 and Boiling Water Reactor Experiment-I Burial Grounds Engineered Barriers, as required by the Occupational Safety and Health Administration Standard, 29 Code of Federal Regulations 1910.120. In addition to containing 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 authorized safety basis as detailed in the *Hazard Classification of Environmental Restoration Activities at the Idaho National Engineering Laboratory,* INEL-96/0054, Rev. 0, March 1996, and *Radiological Air Monitoring Hazardous Index (IH) for Remediation of SL-1/BORAX-I Burial Grounds,* EDF CFA-003, March 1996.

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ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
ARA	Auxiliary Reactor Area
ARDC	Administrative Record and Document Control
BORAX-I	Boiling Water Reactor Experiment-I
CE	Construction Engineer
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CM	Construction Manager
CRZ	Contamination Reduction Zone
DC	Document Control
DOE	Department of Energy
DOE-ID	Department of Energy, Idaho Operations Office
DOT	Department of Transportation
ER	Environmental Restoration
EPA	Environmental Protection Agency
FUM	Facilities, Utilities, and Maintenance
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations
HI	Hazardous Index
HSO	Health and Safety Officer
IDHW	Idaho Department of Health and Welfare
IH	Industrial Hygienist
INEL	Idaho National Engineering Laboratory
JSS	Job Site Supervisor
LITCO	Lockheed Idaho Technologies Company
MCP	Management Control Procedure
MSDS	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
Parsons ES	Parsons Engineering Science, Inc.

ACRONYMS AND ABBREVIATIONS (continued)

PPE	Personal Protective Equipment
PRD	Program Requirements Directive
QAPjP	Quality Assurance Project Plan
QPP	Quality Program Plan
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
RCT	Radiological Control Technician
RWP	Radiological Work Permit
SL-1	Stationary Low-Power Reactor
SWP	Safe Work Permits
WCC	Warning Communication Center

SECTION 1

INTRODUCTION

This task-specific health and safety plan (HASP) establishes the procedures and requirements which will be used to minimize health and safety risks encountered during activities for the remediation of the Stationary Low-Power Reactor/Boiling Reactor Experiment-I (SL-1/BORAX-I) Burial Grounds within Operable Units (OU) 5-05/6-01. Designed 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," this HASP demonstrates accordance with:

- The National Institute of Occupational Safety and Health (NIOSH)/OSHA/U.S. Coast Guard/U.S. Environmental Protection Agency (EPA) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985),
- The Lockheed Idaho Technologies Company (LITCO) *Company Procedures Manual; the LITCO Hazard Prevention and Control Manual*,
- The Idaho National Engineering Laboratory (INEL) *Radiological Control Manual*,
- The LITCO *Radiological Control Subject Area Manual.*

This HASP has been prepared to comply with the authorized safety basis as detailed in the *Radiological Air Monitoring Hazardous Index (IH) for Remediation of SL-1/BORAX-I Burial Grounds,* EDF CFA-003, March 1996.

This HASP shall govern all work at the work sites performed by employees of LITCO and Parsons Engineering Science, Inc. (Parsons ES), Subcontractors to LITCO and Parsons ES, and employees of the United States (U.S.) Department of Energy (DOE) laboratories or other companies. Persons not normally assigned to work at the work site, such as representatives of the U.S. Department of Energy, Idaho Operations Office (DOE-ID), the Idaho Department of Health and Welfare (IDHW), OSHA, and the U.S. EPA, shall be considered nonworkers and fall under the definition of occasional site workers as stated in OSHA 29 CFR 1910.120.

1.1 Idaho National Engineering Laboratory Site Description

The INEL, formerly the National Reactor Testing Station (NRTS), encompasses 890 square miles, and is located 42 miles west of Idaho Falls, Idaho (Figure 1-1). The U.S. Atomic Energy Commission, now the DOE, established the NRTS in 1949 as a site for building and testing a variety of nuclear facilities. Since 1952, the INEL has also been the storage facility of transuranic radionuclides and low-level radioactive waste. At present, the INEL supports engineering and operations efforts of DOE and other Federal agencies in the 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-ID has responsibility for the INEL, and designates authority to operate the INEL to government contractors. The primary contractor for DOE-ID at the INEL is LITCO, which provides managing and operating services to the majority of INEL facilities. The Remedial Design/Remedial Action (RD/RA) Subcontractor for LITCO at the INEL is Parsons ES, which provides managing services for removal actions, decontamination and dismantlement treatment actions, and RD/RA activities.

1.2 Work Site Description

The SL-1 and BORAX-I Burial Ground sites were identified in the Consent Order and Compliance Agreement, signed by the EPA and the DOE, and promulgated in 1987, pursuant to the Resource Conservation and Recovery Act Section 3008(h). Under this agreement, the DOE initially assessed and screened the identified sites and established a procedure for conducting corrective actions. Both burial grounds were identified as solid waste management units and classified as Track 2 OUs, possibly requiring field data collection before a remedial decision could be reached.

Results of the 1993 Track 2 preliminary scoping for the SL-1 burial ground led the agencies to conclude that the evaluation of the site should be elevated to a remedial investigation/ feasibility study (RI/FS). The scope of the investigation was limited to existing data considered sufficient by the agencies to determine the remedial action for the site, and the feasibility study focused on examining remedial alternatives selected in other Records of Decision for similar sites. In addition, due to the similarities between the BORAX-I burial ground and the SL-1 burial ground, the agencies determined that both sites would be assessed in the same RI/FS.

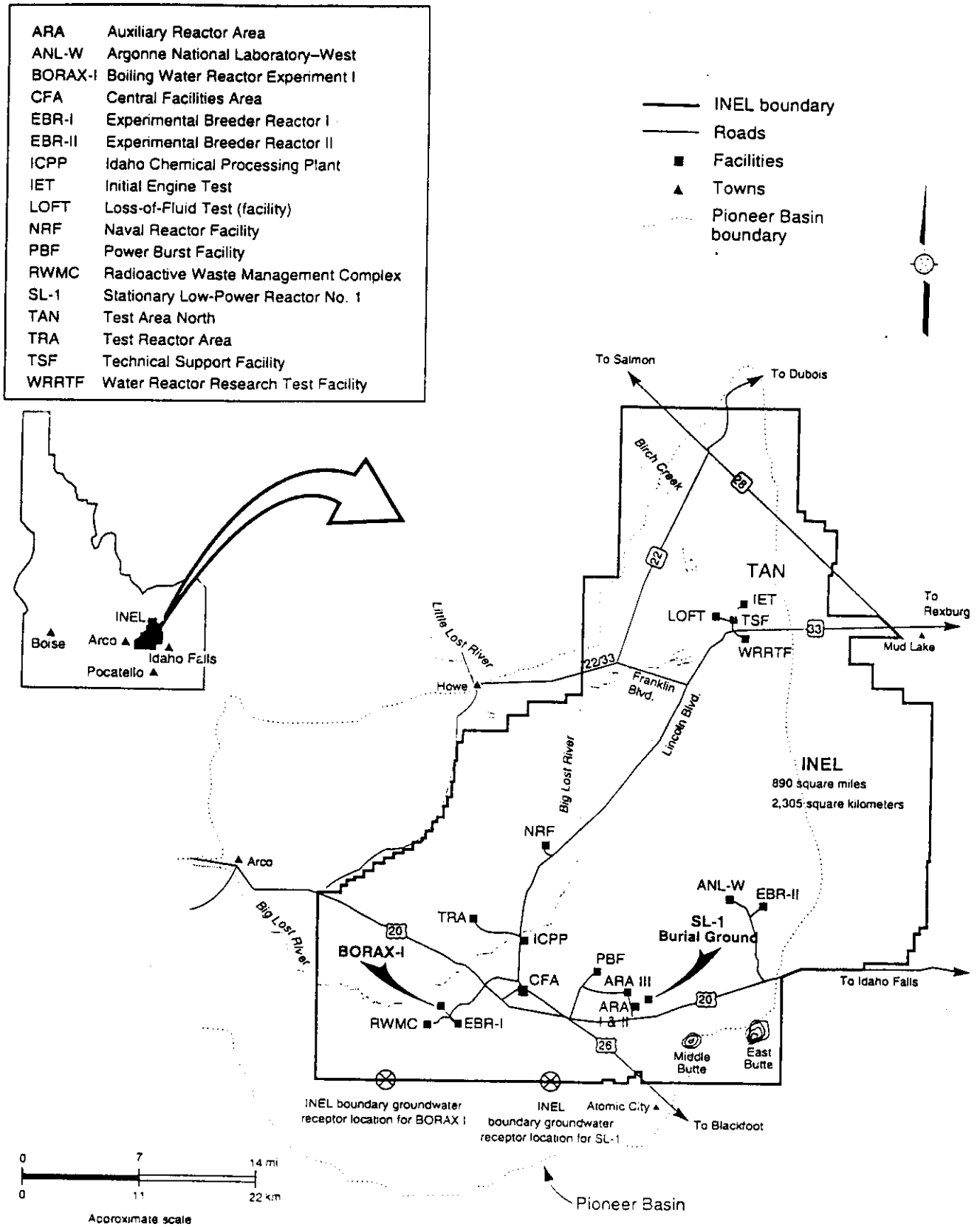

Figure 1-1 - Map of the INEL Showing Locations of Major Facilities

The Record of Decision documents the remedy selected based on the results of the RI/FS and additional information contained in the Administrative Record for OUs 5-05 and 6-01. Supplementary details concerning the history of each of the two burial grounds follow in the next two subsections.

1.2.1 Stationary Low-Power Reactor-1

The SL-1 was a small nuclear power plant designed for the military to generate electric power and heat for remote arctic installations. The reactor operated as a test, demonstration, and training facility from August 1958 until January 3, 1961, when the reactor accidentally achieved a prompt critical nuclear reaction, causing a steam explosion that destroyed the reactor and resulted in the deaths of the three operators on duty. The reactor vessel and building were severely damaged and highly contaminated, and a massive cleanup operation ensued to dismantle and dispose the reactor and building.

A burial ground was constructed approximately 1,600 feet (488 m) northeast of the original site of the reactor to minimize the radiation exposure to the public and site workers which would have resulted from transporting contaminated debris from SL-1 to the Radioactive Waste Management Complex over 16 miles (26 km) of public highway. The original cleanup of the site took about 18 months. The entire reactor building, contaminated materials from nearby buildings, and soil and gravel contaminated during cleanup operations were disposed in the burial ground. The majority of buried materials consists of soils and gravel. Figure 1-2 presents the layout of the SL-1 burial ground relative to Auxiliary Reactor Area (ARA)-II and the original SL-1 reactor site.

The SL-1 burial ground consists of three excavations, in which a total volume of 99,000 cubic feet (2,800-m^3) of contaminated material was deposited. The excavations were dug as close to basalt as the equipment allowed, and ranged from 8 to 14 feet (2.3 to 4.3 m) in depth. At least 2 feet (0.6 m) of clean backfill was placed over each excavation. Shallow mounds of soil over the excavations were added at the completion of cleanup activities in September 1962. OU 5-05 is defined as the surface and subsurface soils and debris within the 550 by 250 foot SL-1 burial ground exclusion fence and the surface area surrounding the burial ground (see Figure 1-2). (Other residual surface contamination from the SL-1 accident is being investigated in Waste Area Group 5 under OU 5-12, site code ARA-23, which is southwest of and adjacent to OU 5-05 (see Figure 1-2) and includes the original location of

the SL-1 reactor). A sampling effort was conducted and revealed that 885 cu. yds. of radiological contaminated soil was above the action level of 16.7 pCi/g. This soil is a part of this project. Figure 7-1, page 7-2 of this HASP, identifies the locations of the proposed excavated areas.

The SL-1 burial ground is currently defined by a three-strand, barbed-wire exclusion fence posted with radiological control signs. Inside the burial ground, the ends of the excavations are identified by concrete markers. The surface of the burial ground is covered with various grass species. The two mounds and several minor depressions due to subsidence are visible within the fenced area. All vegetation collected during the grubbing operation will be put into a trench at SL-1 and covered with soil. A second radiological-control fence encompasses the burial ground, a larger contaminated surface soil area, and the ARA I and II facilities. Fences restricting access are posted with radiological-control signs for the purpose of protecting INEL workers and the public from exposure.

A new graveled access road will be constructed at the north end of SL-1 to provide access for construction traffic to the laydown area (see drawing C-04 in the RD/RA Work Plan, Appendix B).

1.2.2 Boiling Water Reactor Experiment-I

The BORAX-I reactor was a small experimental reactor used in the summer months of 1953 and 1954 for testing boiling-water reactor technology. In 1954, the design mission of BORAX-I was completed, and the decision was made to make one final test, which resulted in the intentional destruction of the reactor. The destruction of the reactor contaminated approximately 84,000 square feet of the surrounding terrain. Immediately following the final test of the BORAX-I reactor, much of the radioactive debris, including some fuel residue, was collected and buried on site in the reactor shield tank. Recovered fuel residue and fuel fragments were sent to the Idaho Chemical Processing Plant and Oak Ridge National Laboratory in Tennessee. Reusable equipment associated with the reactor was successfully decontaminated and used in the construction of BORAX-II. However, the cleanup did not sufficiently reduce the radioactivity at the site; therefore, the 84,000-square foot (7,800-,m^2) contaminated area was covered with approximately 6 inches (15 cm) of gravel to reduce radiation levels at the ground surface.

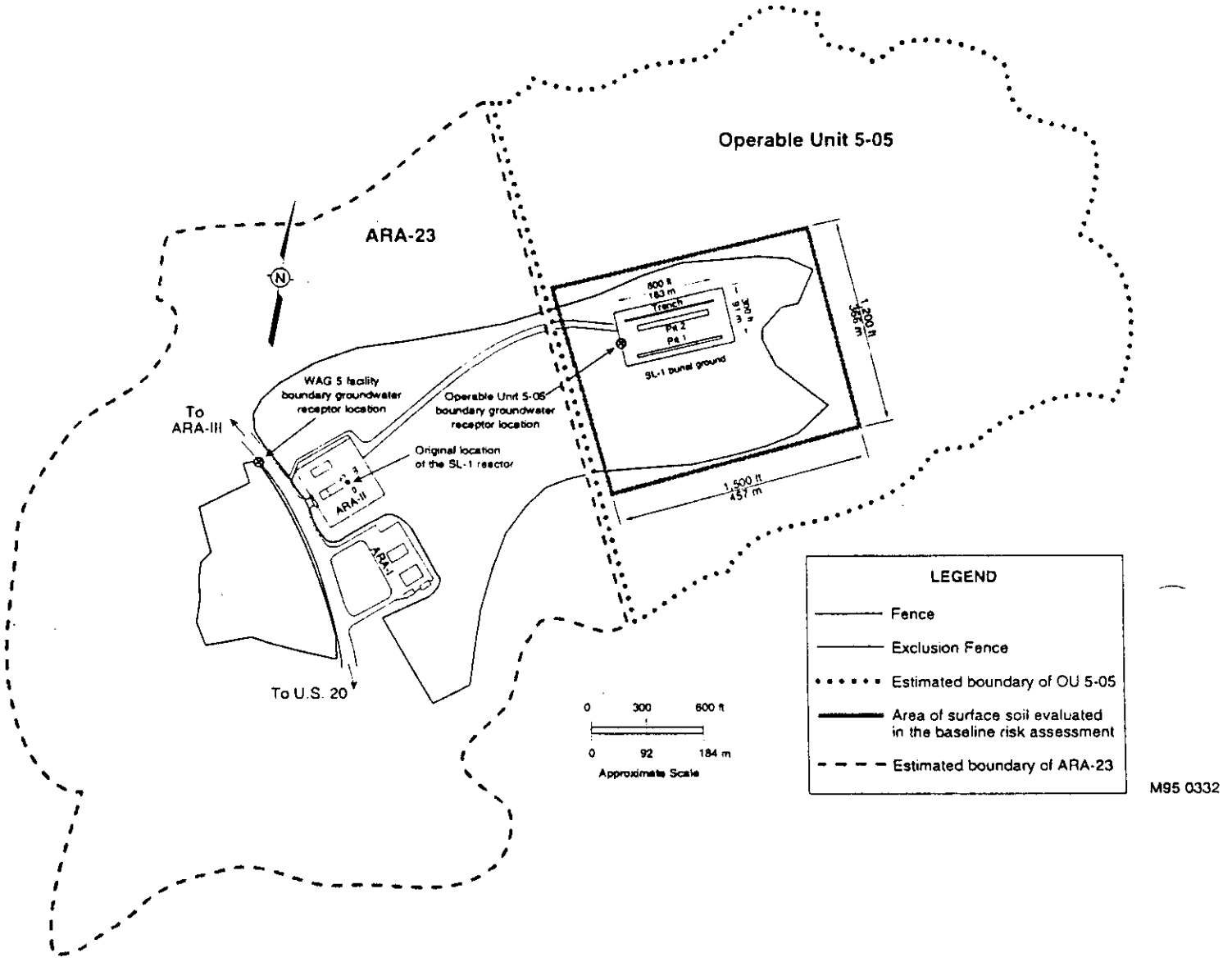

Figure 1-2 - SL-1 Burial Grounds

Buried materials at the site consist of uncovered uranium fuel residue, irradiated metal scrap, and contaminated soil and debris. Part of the waste was buried in the bottom half of the shield tank; the top half of the tank was collapsed into the bottom and the void space filled with debris. The burial ground is contained within the foundation of the BORAX-I installation, the dimensions of which are 18 by 32 by 11 feet (5.5 by 9.8 by 3.4 m). A mounded gravel and dirt cover, approximately 5-feet (1.5 m) high and 30-feet (9 m) in diameter, is centered over the buried shield tank. The OU 6-01 action includes the buried debris, as well as the 84,000-square feet (7,800-m^2) of radiologically contaminated surface soil. However, the sampling effort revealed that 725 cu. yds. of radiological contaminated soil measured above the action level of 16.7 pCi/g, as indicated by the hatched areas on Figure 1.3. This soil will also be included as part of the project. Figure 7-2, page 7-5 of this HASP, identifies the locations of the proposed excavated areas.

The ground surface at the site currently looks very much like the surrounding terrain. Abundant native vegetation has grown over the mound and surrounding area. A large stake about 5 feet (1.5 m) tall marks the reactor location. A 6-foot (1.8 m) high chain-link fence surrounds the burial ground, forming an enclosed area approximately 100 feet (30 m) on each side. The radiologically contaminated surface soil area outside of the chain-link fence is bounded by a two-wire exclusion fence and restricted access. Fences restricting access are posted with radiological-control signs for the purpose of protecting INEL workers and the public from exposure.

The existing road which runs off of Van Buren Boulevard will be used to gain access to BORAX-I (see drawing C-01, Appendix B).

This HASP addresses activities for the remediation of the SL-1 and BORAX-I burial grounds within OUs 5-05 and 6-01, respectively.

1.3 Scope of Work

The following describes the scope of work for the Remedial Action activities at the SL-1 and BORAX-I burial grounds sites.

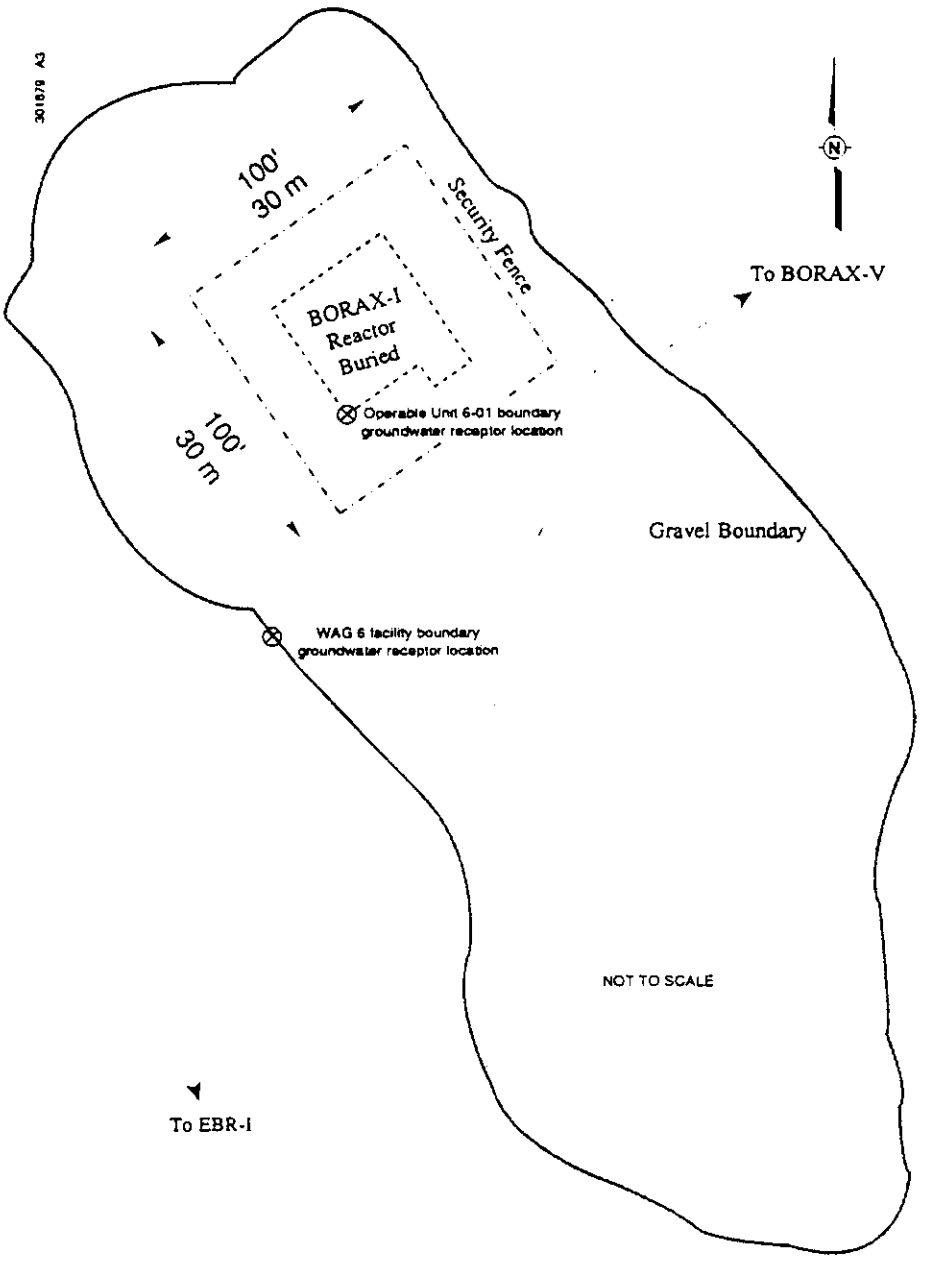

Figure 1-3 - BORAX-I Burial Grounds

1.3.1 Development of Staging Areas

Staging areas shall be developed as necessary prior to commencement of work for the placement of equipment, materials, trailers, sanitation facilities, etc.

1.3.2 Development of Access Routes

A new graveled access road will be constructed at SL-1 which will provide access to the job site separate from any activities at ARA-II. The existing access road at BORAX-I will be evaluated and, if required, reworked to make it acceptable for construction traffic.

1.3.3 Development of Borrow Sites

Rip rap will be obtained from a source directly south of CPP. Gravel for construction of the biotic barrier layers at SL-1 will be obtained from the Lincoln Avenue Pit located 12 miles north of Central Facilities Area (CFA) on Lincoln Avenue. The cobble needed for construction of the biotic barrier at SL-1 will be obtained from an off-site source. Borrow sites and access routes between borrow sites and work sites will be defined and inspected prior to the commencement of work.

1.3.4 Mobilization

Prior to mobilization, the Subcontractor shall submit all required submittals, work plans, bonds, and insurance, and provide documentation that all necessary training and medical examinations are complete. Additionally, the Subcontractor shall establish a site office at the INEL.

The support areas will be grubbed, covered with gravel, marked, etc. All office units, including porta potties, will be secured (staked) upon delivery to the site. Designated flammable material, storage, and smoking areas will be posted, grubbed, and graveled to provide a fire break. Smoking areas will be posted, with enforcement for butt disposal in Subcontractor provided cans.

1.3.5 Development of Access Routes into Work Zones

The Subcontractor, with the Radiological Control Technician (RCT) and Industrial Hygienist (IH), will establish a haul corridor within the work zone and into the work zones to ensure that contamination will not spread within or beyond the exclusion areas.

1.3.6 Establishment of Work Control Boundaries

The Subcontractor shall develop the necessary exclusion areas, laydown areas, contamination reduction zones (CRZ), etc., and associated barricades and fences, prior to commencement of work.

1.3.7 Grubbing

The Subcontractor shall clear the sites of shrubs, vegetation, fences and other debris, except for items indicated by the Contractor to be saved and protected. Disturbance of underlaying soils shall be minimized during all clearing and grubbing activities. The Subcontractor shall confine clearing and grubbing operations to within those areas required for barrier construction or as directed by the Contractor.

1.3.8 Disposal of Grubbed Material

Grubbed materials, including grass, shrubs, stumps, roots, signs, fencing, and other debris removed due to clearing activities, shall be disposed by the Subcontractor by placing it on the burial ground in a layer not to exceed 6 inches at the BORAX-I site, or by placing it between Trench 1 and Pit 2 at the SL-1 site in a layer not to exceed 6 inches. The chain link fence at SL-1 will also be removed and disposed with the grubbed material.

1.3.9 Consolidation of Radiologically Contaminated Soils

At BORAX-I, the areas of radiologically contaminated surface soils shall be excavated to a depth of 12 inches, and at SL-1, surface soils shall be excavated to a depth of 6 inches; both will be transported down designated haul roads. The excavated soil will be placed on the area above the burial ground at BORAX-I, and on the areas between Trench 1 and Pit 2 and on Pit 1 at SL-1 burial ground. Layers of radiologically contaminated soil shall be deposited

and compacted in accordance with the project specifications. Precautions will be taken to prevent the generation of fugitive dust. Personal Protective Equipment (PPE) shall be used as specified in Section 8 of this document, and as determined by the RCT present at the job site. Equipment necessary for consolidation of radiologically contaminated soils will remain within the contamination control zones until the completion of consolidation activities in order to minimize the spread of contamination.

1.3.10 Borrow and Stockpile Operations

The cobble, rip rap, and gravel materials designated for this project will be mined from borrow sources as designated. Borrow operations shall be performed in accordance with the Borrow Request form of the specific borrow site. The Subcontractor shall set up an operation at the borrow area, and stockpile the material from the borrow source at the project site. This work will require the services of heavy earthwork equipment such as scrapers, dozers, loaders, and large dump trucks. The work will require up front planning and coordination with other site operations and personnel to insure safe and productive hauling across site roads. Equipment used for the haul and stockpile operations will remain outside of the radiation work areas.

1.3.11 Placement of Rip Rap Layer

Rip rap material obtained from a location 1/2 mile south of CPP will be placed over the consolidated surface soil at the BORAX-I site. Placement will be performed in a manner which minimizes disturbance of the consolidated soils and maximizes the use of the rip rap material. As far as possible, the rip rap shall be selected during the haul operation to utilize material in the 12 to 24 inch size gradation. The slope in the edge of the barrier layer shall be toe nailed in to prevent future movement of the rip rap layer.

Placement will be performed in a manner which minimizes disturbance of the biotic barrier layers and maximizes the use of the rip rap material. The rip rap shall be selected during the haul operation to utilize material in the 12 to 24 inch size gradation, as far as possible. The slope in the edge of the barrier layer shall be toe nailed in to prevent future movement of the rip rap layer.

1.3.12 Surface Water

The barriers and adjacent excavated areas will be graded to encourage drainage away from the barriers. The engineered barriers will maintain the existing surface water flow pattern. The areas adjacent to the barriers will be contoured and graded to enhance drainage away from the caps. Revegetation of the area around the barriers, along with the existing low slopes of the sites, will encourage drainage without erosion. The project specifications will follow guidance provided by the project Storm Water Pollution Prevention Plan.

1.3.13 Decontamination

A temporary decontamination pad for personnel and equipment decontamination shall be established at the control points for each barrier and used as an isolation area for the tools and equipment to be cleaned. Prior to moving from one burial site to the next, all tools and equipment will be decontaminated with dry methods using brooms, wire brushes, and putty knives. Any equipment with residual contamination will be cleaned with high pressure water spray from a portable unit after the initial dry decontamination efforts (Section 9 of the HASP).

1.3.14 Reseeding

Areas that have been disturbed during construction activities will be graded, fertilized, seeded and mulched in accordance with the Project Specifications 02930, found in Appendix D of the RD/RA Work Plan. Borrow locations, areas adjacent to the engineered barriers, and any other areas outside the designated areas that are damaged or disturbed by the Subcontractor's operation shall be repaired and seeded by the Subcontractor. The engineered barriers will not require seeding.

1.3.15 Installation of Security Fencing/Postings/Markers

Fences, signs, and postings will be erected to identify and demark work areas, radiological contamination zones, decontamination areas, laydown areas for delivering and storing materials and equipment, and staging areas.

1.3.16 Demobilization

After the remediation action activities have been satisfactorily completed, the Subcontractor will demobilize from the site. The office trailer and equipment will be removed from site. The decontamination pad and fencings erected by the Subcontractor will be removed and packaged or disposed appropriately.

SECTION 2

WORK SITE RESPONSIBILITIES

2.1 Work Site Personnel

The organizational structure for this task reflects the resources and expertise required to perform the task while minimizing risks to worker health and safety. The key roles at the task site and the lines of responsibility and communication are shown on the organizational chart for the task (Figure 2-1). The following subsections outline the responsibilities of key personnel.

The implementation of the personnel presented in Section 2.1 will be developed between LITCO, Parsons ES, and subtier contractor(s) during project mobilization. The functional responsibilities of each key person are developed in the following subsections.

2.1.1 Environmental Restoration Director

The LITCO Environmental Restoration (ER) Director has ultimate responsibility for the technical quality of all projects and the safety of personnel during field activities performed by or for the ER Program activities. Providing technical coordination and interfacing with the DOE-ID Environmental Support Office, the ER Director ensures that:

- All activities are conducted in accordance with DOE, EPA, OSHA, and IDHW 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.

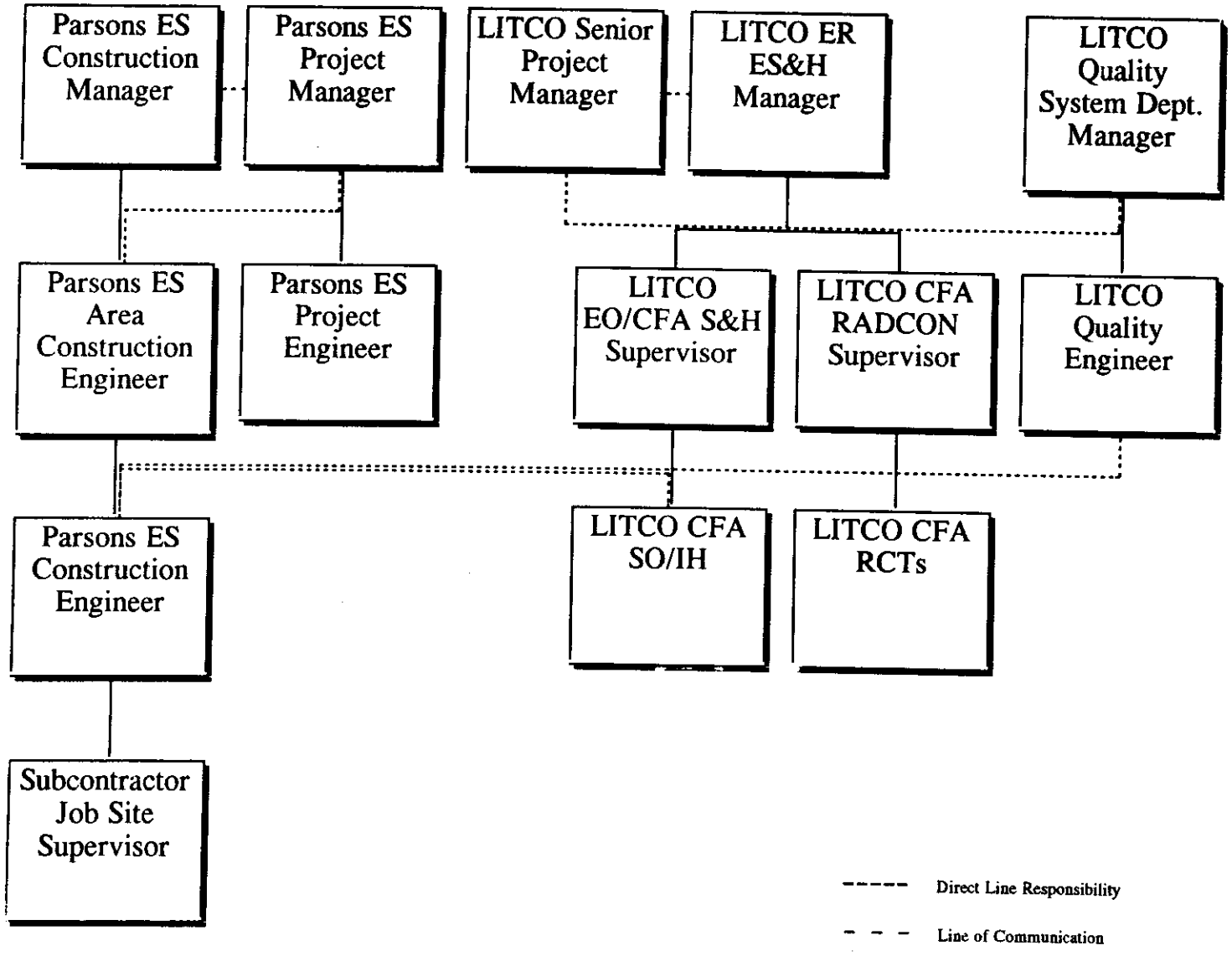

Figure 2-1 - Field Organization Chart

2.1.2 LITCO Project Manager

The LITCO project manager has the responsibility for oversight of all activities conducted during the project.

2.1.3 Parsons ES Project Manager

The Parsons ES project manager is responsible for ensuring that all activities conducted during the project are in compliance with the *Parsons ES RD/RA Project Procedure, Parsons ES General Conditions and Special Conditions* of the subcontract, applicable LITCO MCPs, PRDs, and all applicable OSHA, EPA, DOE, DOT, and State of Idaho requirements. Responsible for ensuring that tasks comply with the *Quality Program Plan for the Environmental Restoration Program* (QPP-149), the QAPjP, this HASP, and the sampling and analysis plan, the Parsons ES project manager coordinates all field, laboratory, and modeling activities, reports to the Parsons ES RD/RA manager, and interfaces with the LITCO ER project manager.

2.1.4 Parsons ES Construction Manager

The Parsons ES Construction Manager (CM) is responsible for field implementation of the project. This involves ensuring that all project tasks receive appropriate health and safety review before commencement, and that the necessary equipment and facilities are made available to implement the provisions of this plan. The Parsons ES CM may delegate any or all of the above responsibilities. The CM reports to the Parsons ES RD/RA Manager.

2.1.5 Parsons ES Construction Engineer

The Parsons ES Construction Engineer (CE) is the individual representing Parsons ES RD/RA management for the work site, with ultimate responsibility for the safe and successful completion of the project tasks assigned to Parsons ES. The CE manages field operations and executes the work plan, enforcing site control and documenting work site activities. All health and safety issues at the work site must be brought to the attention of the CE or designee. The CE reports to the Parsons ES Construction Manager.

2.1.6 Job Site Supervisor

In the event that LITCO Site Services are required on this project, the Job Site Supervisor (JSS) is the supervisor of LITCO craftsmen and other Facilities, Utilities, and Maintenance Department (FUM) personnel assigned to work at the site. As the interface between FUM and ER, the JSS works closely with ER personnel (project manager) at the site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The JSS must be informed should any health and safety issues which arise when Site Services are used. The JSS will supervise the LITCO survey team in performing the Field Surveys at both SL-1 and BORAX-I.

2.1.7 Subcontractor Job Site Supervisor

The Subcontractor JSS is the Subcontractor project manager and field supervisor at the work site and reports to Parsons ES CE. The Subcontractor JSS is in charge of:

- Conducting the pre-work briefings for the Subcontractor personnel,
- Accomplish day-to-day operations,
- Identify and obtain additional resources needed at the site,
- Interact with the IH, safety engineer, radiological engineer, RCT, and HSO on matters regarding health and safety, and
- Assure that pre-work briefings occur.

The JSS, like the CE, must be informed of any health and safety issues that arise at the work site and may suspend work at the site if an unsafe condition exists.

2.1.8 Work Site Personnel

All work site personnel, including LITCO and Subcontractor personnel, are responsible for understanding and complying with the requirements of this HASP. Work site personnel will be briefed by the Subcontractor JSS, CE, or RCT at the start of each shift. Work site personnel should bring potentially unsafe conditions to the attention of the Subcontractor JSS, CE, or HSO for corrective action. ***If unsafe conditions develop, work site personnel are authorized to suspend work and notify the Subcontractor JSS, CE, or HSO of the unsafe condition.***

2.1.9 Nonworkers

All persons on the work site who are not a part of the field team for the project are considered nonworkers for the purposes of this project. Persons shall be considered to be "on site" when they are present 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 specified in Section 3. All nonworkers, including LITCO employees from other departments and representatives of DOE, 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,
- Providing proof of meeting the training requirements specified in Section 3 of this HASP, and
- Notifying the Parsons ES CE and Subcontractor HSO.

Casual visitors, defined as persons who do not have specific tasks or other official business to conduct at the site, are not permitted on the site.

2.1.10 LITCO Health and Safety Officer

The LITCO HSO provides oversight for health and safety issues at the work site. The LITCO HSO will:

- Verify compliance to the HASP,
- Conduct conformance inspections,
- Require and monitor corrective actions,
- Monitor decontamination procedures, and require corrections, as appropriate.

The LITCO HSO is supported by other health and safety personnel (safety engineer, IH, RCT, and radiological engineer) at the work site as necessary. This function may be performed by the LITCO IH/Safety or RCT assigned to support the project.

2.1.11 Subcontractor Health and Safety Officer

The Subcontractor HSO provides contact for all aspects of health and safety, and is authorized to suspend work at the site if any operation threatens worker or public health or safety. The HSO is authorized to verify Subcontractor compliance to the HASP. If it is necessary for the HSO to leave the site, an alternate individual will be appointed by the HSO to fulfill this role, and the identity of the acting HSO will be recorded in the CE log book.

2.1.12 Industrial Hygienist

As the primary source of information regarding non-radiological hazardous and toxic agents at the work site, the LITCO IH assesses the potential for worker exposures to hazardous agents in accordance with LITCO company procedures and the LITCO *Hazard Prevention and Control Manual.* The IH will:

- Evaluate and recommend appropriate hazard controls for the protection of work site personnel,
- Review the effectiveness of monitoring and PPE required in this HASP,
- Recommend changes as appropriate,
- Assist in determining if conditions at the work site are safe for reentry following an evacuation.
- Closely coordinate with the RCT.

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. During emergencies involving hazardous materials, IH measurements will be performed by members of the Emergency Response Organization. The LITCO IH/Safety Officer assigned to support this project may also function as the LITCO HSO.

2.1.13 Radiological Control Technician

The LITCO RCT, the primary source of information and guidance on radiological hazards, will be present during any work activities which exhibit or anticipate a radiological hazard to operations personnel. Responsibilities of the RCT include:

- Radiological surveying of the work site, equipment, and samples,
- Providing guidance for radiological decontamination of equipment and personnel,
- Accompanying the affected personnel to the nearest INEL medical facility for evaluation if significant radiological contamination occurs,
- Notifying the CE of any radiological occurrence that must be reported as directed by the INEL Radiological Control Manual.
- Closely coordinate activities with the IH.

2.1.14 Radiological Engineer

The radiological engineer makes recommendations to the RCTs to minimize health and safety risks if a radiological hazard exists or occurs at the work site.

2.1.15 Occupational Medical Program

The INEL OMP provides medical surveillance for LITCO and Parsons ES personnel assigned as hazardous waste site workers, per the 29 CFR 1910.120 Hazardous Waste Operations (HAZWOPER) OSHA standard. The OMP is also responsible for evaluation of all personnel (including the Subcontractor's) injured or exposed to hazardous materials at the work site. Subcontractors are required to have a separate occupational medical surveillance program for HAZWOPER activities. Section 4 details the medical surveillance program.

2.1.16 Facility Landlord or Representative

The LITCO facility landlord manager is responsible for maintaining the assigned facility, and must be cognizant of work being conducted in the facility. The facility tenant manager may be required to sign Safe Work Permits (SWP) and Radiological Work Permits (RWP) governing work performed at the facility.

2.1.17 Environmental Compliance Engineer

The LITCO environmental compliance engineer advises LITCO organizations performing field activities at the INEL including compliance with DOE orders, EPA regulations, and other regulations concerning the 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.

2.2 Record Keeping Requirements

2.2.1 Industrial Hygiene and Radiological Monitoring Records

The IH will record air monitoring and personal sampling data on LITCO IH forms. Industrial hygiene monitoring data are maintained by the IH per LITCO *Hazard Prevention and Control Manual*. Any monitoring done by non-industrial hygiene safety personnel will be documented in a project controlled logbook reviewed by the IH. The RCT will keep a logbook of all radiological monitoring, daily operational activities, and instrument calibrations. Radiological monitoring records are maintained according to Chapter 7 of the INEL *Radiological Control Manual.*

2.2.2 Construction Engineer Daily Force Report

The CE will keep a record of daily work site events in the CE daily force report, and maintain an accurate record of all personnel (workers *and* nonworkers) who are on site each day in site attendance records. These records must be submitted to both Parsons ES Document Control (DC) and Administrative Record and Document Control (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,
- Maintaining a supply of all controlled documents,
- Providing 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), 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 the completion of field activities.

2.2.4 Document Control Office

The Parsons ES DC office is responsible for:

- Organizing and maintaining data and reports generated by ERP field activities,
- Maintaining a supply of all controlled documents,
- Providing a documented system for the control and release of documents, reports, and records.

Copies of the LITCO *Management Plans for the Environmental Restoration Program,* this HASP, the *Quality Program Plan for the Environmental Restoration Program* (QPP-149), and other documents pertaining to this work are maintained in the project file by DC. All project records and logbooks, except IH and RCT logbooks, must be forwarded to ARDC within 30 days after completion of field activities.

SECTION 3

PERSONNEL TRAINING

All work site personnel will receive training as specified by OSHA 29 CFR 1910.120 and the LITCO *Hazard Prevention and Control Manual.* Radiation worker training shall be conducted in accordance with LITCO *Radiological Control Subject Area Manual* (MCP-126) *"Training"*. Table 3-1 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. The Subcontractor HSO will maintain the Subcontractor's employee records, and the CE will maintain records for others. Examples of acceptable written training documents include:

- 40 Hour OSHA HAZWOPER Card,
- Medic First Aid Training Card,
- A copy of an individual's or unit's (LITCO/Parsons ES only) Training Inquiry System printout demonstrating completion of training,
- A copy of the certificate issued by the institution where the training was received.

Before beginning work at the work site, a project safety orientation will be conducted by the CE, HSO, or other appropriate individual (i.e., LITCO IH/Safety, etc.). 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 3-1. Upon completing the safety orientation, personnel will sign the training acknowledgement 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 CE or HSO for at least the initial three days of project activities, after which, upon completion of satisfactory

performance, the supervisor will complete the training checklist evaluation and obtain the worker's signature certifying that he/she has been trained. Copies of the documentation will be retained in the field training records for the project. LITCO and Parsons ES training records shall be forwarded to the LITCO Environmental Operations (EO) training coordinator (Mail Stop [MS] 3902) for retention in the employee's training records.

A plan of the day meeting (POD) will be performed daily by the CE and HSO (as applicable) and will include:

- An outline of the tasks,
- Identification of hazards,
- Hazards control and the establishment of work zones, and
- A discussion of PPE requirements.

After completion of this briefing, workers' 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 3-1 - Required Training for Work Site Personnel

Task/Position Topic	CE Required	Field Team Required	HSO Required	ES&H Support Required	Nonworkers
Work Site Orientation	X	X	X	X	X
Decontamination[a]	X	X	X	X	X[b]
Hazard Communication[a]	X	X	X	X	X
Site control and warning devices[a]	X	X	X	X	X
Emergency action plan for work site[a]	X	X	X	X	X
40 hour HAZWOPER[c]	X	X	X	X	---
24 hour HAZWOPER[c] supervised field experience	X	X	X	X	---

Task/Position Topic	CE Required	Field Team Required	HSO Required	ES&H Support Required	Nonworkers
8 hour HAZWOPER[j] site supervisor	X[d]	---	X[d]	X[d]	---
Hearing conservation	X	X	X	X	X[d]
Radiological Worker II	X[d]	X[d]	X[d]	X[d]	X[d]
Medic First[e]	X	X[d]	X[d]	X[d]	---
Respirator qualification and fit test	X[f]	X[f]	X[f]	X[f]	X[f]
24 hour HAZWOPER[g] occasional worker	---	---	---	---	X
8 hour HAZWOPER supervised field experience	---	---	---	---	X
HAZMAT Employee General Awareness Training	X[h]	X[h]	X[h]		X[h]
Confined Space entrant/attendant	---	---	---	---	---
Confined Space Job Entry Supervisor	---	---	---	---	---

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]).
i) Training shall be documented by a checklist (Section 13 of this HASP) completed and signed by the project CE.
j) Required of all supervisory personnel (i.e., CE, IH, Safety, etc.).

NOTE: The above requirements are for workers who enter the radiological contamination areas only. Those workers who enter the support zones are required to comply with requirements a) above.

SECTION 4

OCCUPATIONAL MEDICAL PROGRAM AND SURVEILLANCE

LITCO and Parsons ES work site personnel shall participate in the INEL 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 or 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, submitted to the OMP prior to the commencement of work, must be provided to the OMP for each hazardous material worker. Information furnished to the OMP must be supplemented or updated annually for 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 INEL 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 upon the employee's returning 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 his/her own ability to work.

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

- Entry into substance-specific medical surveillance programs,
- 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.

4.1 Subcontractor Workers

Subcontractor work site personnel shall participate in their own OMP per the requirements of OSHA 29 CFR 1910.120, which require 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.

4.2 Injuries on the Work Site

It is the policy of the OMP to examine all workers, including the Subcontractor's employees, if the workers are injured on the job, or experience 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 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 evaluations will be conducted in accordance with the exposure level, symptoms, involved hazards, and specific medical surveillance requirements.

As soon as possible after an injured person has been attended, the CE, or designee, will perform the notifications specified in Section 10.2 of this HASP.

4.3 Substance-Specific Medical Surveillance

All workers whose daily time weighted average noise level is expected to exceed 85 dB(A) will be required to have a current audiogram prior to site work activities. No chemical or radiological substance (in-vivo bioassay) specific medical surveillance is required for this project (refer to EDF CFA-003, March 1996, and INEL Radcon Manual, Article 522, item 5).

SECTION 5

SAFE WORK PRACTICES

5.1 General Safe Work Practices

The following are general safe work practices that will be enforced at the work site.

1) Contact lenses will not be worn 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 LITCO *Hazards Prevention and Loss Control Manual*, PRD-86, "Eye, Face, and Head Protection".

2) ***Absolutely no*** eating, drinking, chewing gum or tobacco, smoking, cosmetics applications, or any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials will be allowed except in the designated zone(s).

3) All injuries involving broken skin or open wounds will be reported to the HSO or CE. The OMP will determine if the wound presents a significant risk of internal chemical and/or radiological exposure. The OMP evaluation will consider how the wound is bandaged and will recommend PPE to be worn by the injured employee. Personnel with unprotected wounds shall not be permitted to enter contaminated areas or handle contaminated or potentially contaminated materials at the site.

4) Direct contact with potentially contaminated substances will be avoided. Walking through spills or other areas of contamination will not be permitted. Kneeling, leaning, or sitting on equipment or ground that may be contaminated will be avoided.

5) Workers will be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and broken containers, and report all potentially dangerous situations to the CE, JSS, or HSO.

6) Releases of hazardous materials, including those used at the work site, will be prevented. Any spill will be contained (if possible) and reported to the CE, or JSS and facility representative, where applicable.

Steps will then be taken to clean the spill 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. Section 10 of this HASP details the spill response plan for the work site.

7) Splashing or pouring of liquids during decontamination will be avoided.

8) All ignition sources will be kept at least 50 ft from explosive or flammable environments and nonsparking, explosion-proof equipment used when recommended by a safety professional. All flammable materials will be stored in approved containers and areas as approved by the LITCO HSO.

9) All vehicles, when parked, will be parked in designated zones that are free of vegetation and graveled or overlain with fill material to prevent range fires.

10) Smoking will only be allowed in designated areas. Smoking materials (butts, etc.) will be disposed in provided disposal containers. Routine house keeping policing will be used to maintain compliance.

11) Workers will 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.

12) Employees working in the exclusion zone will work in teams according to the "buddy system" (Section 5.3 of this HASP).

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

5.2 ALARA Principles

Personnel employed at the work site must strive to keep radiation and chemical exposure ALARA through the following practices:

- Radiological Work Permit compliance,
- Radiation and chemical exposure limit awareness,
- Adherence to all written radiological and chemical safety requirements and verbal guidance,
- Awareness of personal radiation and chemical exposure history,
- Compliance to ALARA guidelines and suggesting recommendations as needed,
- Minimization of the production of all radioactive and chemical contaminated waste,
- Minimization of personal radiation and chemical exposure, through adherence to these basic protection techniques:
  - **Time** - Minimize exposure time;
  - **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 appropriate systems to control airborne exposures.

ALARA principles will be maintained at all times and exposure limits will be maintained below the INEL *Radiological Control Manual* administrative control level of 1500 mrem to the whole body, committed effective dose equivalent. Constant surveillance by RCTs and avoidance of hot spots by personnel during the remediation work will further assist in reducing personnel exposure.

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 at least one "buddy" by the CE or JSS to work with and regularly check on during the day. Workers need to be able to see, hear, and effectively communicate with their buddies at all times when in the exclusion zone. Employees should watch for signs and symptoms of illness or injury in their assigned buddies.

SECTION 6

SITE CONTROL AND SECURITY

Prior to any process, the RCT and the IH/IHT, in coordination with the HSO, shall ensure proper work zone perimeters have been established around the work areas. Establishing work zones will help ensure that personnel are properly protected against the hazards present in their specific working environments, as well as ensure that work activities and contamination are confined to appropriate areas. Work zones also prevent non-workers and on-lookers from walking into an exclusion area.

Modifications to the type or area of the work zones will be made as deemed appropriate by the RCT and/or IH/IHT based on initial or continuous field screening data. These modifications will be reviewed with the CE before their implementation. If modifications are made to the zone (e.g., size, type, and PPE requirements), the appropriate personnel will be notified for approval and the RWP will be revised accordingly. Entry into work site work zones must be controlled through the appropriate use of barriers, signs, and other measures, as per Section 6.5 of this HASP. Personnel not directly involved with the activity shall be excluded from entering work zones. Nonworkers, such as inspectors, may be admitted to the work sites provided they are on official business and have demonstrated compliance with the training requirements in Section 3. Visitors must comply with the PPE and other requirements of this HASP.

The following sections describe work zones that may be established at the sites during the project. Figure 6-1 shows the SL-1 and BORAX-I Burial Grounds sites example work zones and radiological areas.

6.1 Exclusion Zone

The exclusion zone includes the immediate work area and the chemical/radiological contamination area. Only the minimum number of personnel required to safely perform the required operations will be allowed into the exclusion zone. The exclusion zone for SL-1 and for BORAX-I operations areas shall be the immediate work area around the burial

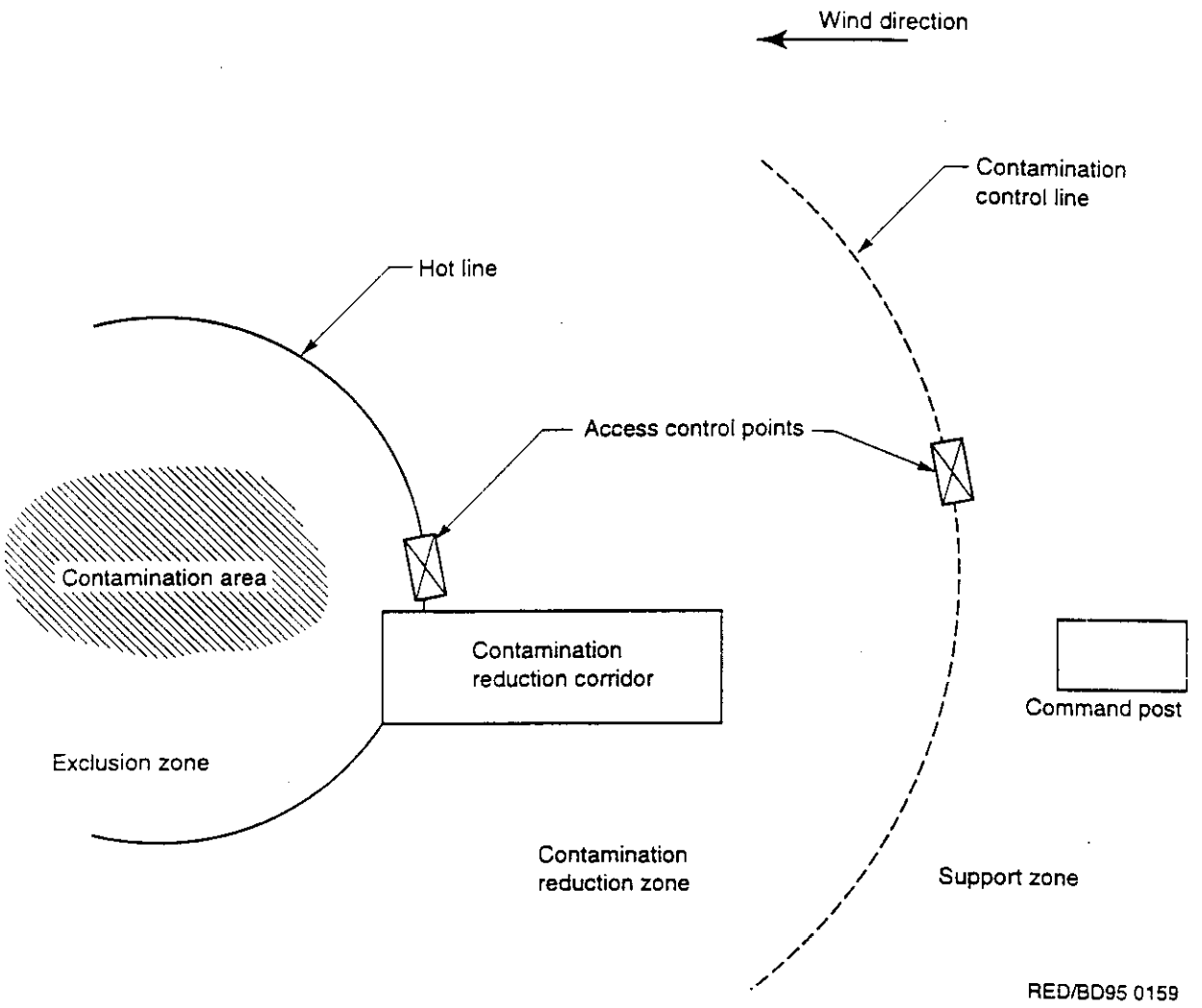

Figure 6-1 - Established Work Zones for the SL-1 and BORAX-I Burial Grounds Sites

grounds, including the areas of radiologically contaminated soils which are scheduled for consolidation. Project drawings C-01 and C-04, found in Appendix C, illustrate the Exclusion Zone, at the respective sites. The areas will be posted with "Exclusion Area" and appropriate radiological signs as deemed necessary by the RCT. The exclusion zones within radiologically controlled areas will be accessed via a step-off pad established by the RCT at the perimeter. At the discretion of the RCT and the IH/IHT, exclusion zones may be modified, based upon the actual hazards encountered, with appropriate changes made to the RWP.

6.2 Contamination Reduction Zone

The CRZ is a transition area that bounds the exclusion zone and is 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. Because of the potential for contamination, PPE and sample packaging and preparation equipment shall *not* be stored in the CRZ.

6.3 Support Zone

The support zone is an area containing the work site command center, the grubbed and graveled vehicle parking lot, additional equipment staging, and any work site support activities. The support zone will be limited to the access road and the parking area and office trailers. Fuel storage with appropriate spill containment, fire protection, and traffic protection controls may be staged in this area. Materials or equipment may also be staged in this area.

6.4 Designated Eating Area

No smoking, gum or tobacco chewing, eating, or drinking is allowed at the work site, except in designated eating areas. Smoking is allowed only in designated posted areas with fire protection (grubbed vegetation/gravel, waste containers). Potable water will be provided at the entrance to the contaminated reduction zone for drinking water purposes. Portable washing facilities will be provided at this location for purposes for cleaning hands and faces prior to obtaining drinking water.

Ingestion of hazardous substances is more likely to occur when workers do not practice good personal hygiene habits. It is important for the employees to wash hands, faces, and other exposed skin areas thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco.

6.5 Postings and Boundaries

Barriers, signs, and postings will comply with LITCO PRD-24, "Signs, Color Codes, Signaling, and Barricades," which is contained in the LITCO *Hazard Prevention and Control Manual*.

All zones will be posted. Instructions to visitors, the location of offices, and the point of contact will be posted at each site. All designated areas - smoking, eating, evacuation, flammable material, or hazardous materials - will be posted. All radioactive or radioactive contaminated areas will be posted in accordance with the INEL Radcon Manual.

SECTION 7

HAZARD EVALUATION

7.1 Hazard Assessment

Personnel may be exposed to industrial safety hazards, and radiological, chemical and physical agents while working at the work site. The degree of hazard(s) posed to on-site personnel entering the work zones is dependent on both the chemical/radiological nature of the contaminant(s) and the task(s) being performed. The industrial hygiene hazard monitoring plans are outlined in Sections 7.2.1 and 7.2.2, respectively. RCT monitoring is outlined in Section 7.2.1.

7.1.1 SL-1 Burial Ground Soil Contamination

SL-1 burial ground radiologically contaminated surface soils comprise approximately 885 cubic yards of material. The locations of the areas to be consolidated are illustrated in Figure 7-1. Identification of the contaminants of concern associated with surface soils at SL-1 was based on comparisons of analytical data with background concentrations. Table 7-1 presents the contaminants of concern for surface soils with their present concentrations, based on current measurement.

Subsurface contamination in the SL-1 burial ground is restricted to the excavations that received contaminated building debris, equipment, and gravel and soil from the demolition and cleanup following the SL-1 reactor accident. The estimated volume of buried contaminated material is 99,000 cubic feet (2,800 m^3).

According to the latest survey made on September 29, 1995, the general body radiation field above the SL-1 burial ground was <0.1 mrem/hr.

Air Monitoring Hazardous Index (HI) calculations performed for SL-1 indicate an HI well below 1, which is defined as a very low level of hazard from airborne activity. Air sampling is not required. If, during the course of construction, higher levels of contamination are

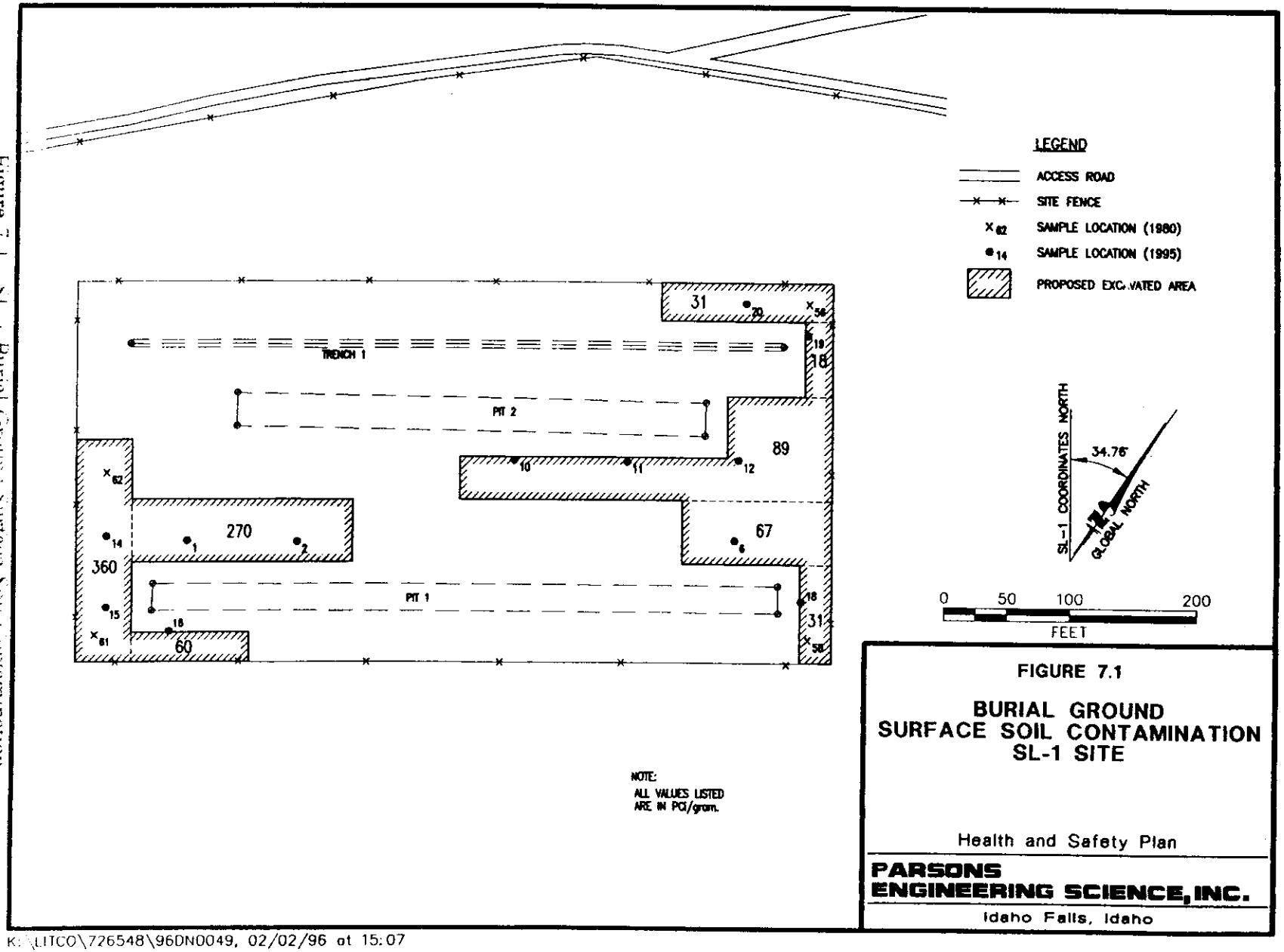

Figure 7-1 - SL-1 Burial Ground Surface Soil Contamination

uncovered, it may be determined by the LITCO IH or RCT that air sampling will be required.

Table 7-1 - Contaminants of Concern Concentrations at SL-1 Burial Ground[a]

Radionuclide	Concentration (pCi/g)
Cobalt-60	0.36
Cesium-137	904
Europium-154	2.68
Strontium-90	1,370

a) Grab sample background concentrations from *Background Dose Equivalent Rates and Surficial Soil Metal and Radionuclide Concentrations for the Idaho National Engineering Laboratory, INTL-94/0250*, S.M. Rood, G.A. Harris, G.J. White, February 1995.

7.1.2 BORAX-I Burial Ground Soil Contamination

The BORAX-I burial ground radiologically contaminated surface soils comprise approximately 725 cubic yards of material. The locations of the areas to be consolidated are illustrated in Figure 7-2. Identification of the contaminants of concern associated with surface soils at BORAX-I was based on comparisons of analytical data to background concentrations. Table 7-2 presents the contaminants of concern for surface soils.

According to the latest survey made on October 31, 1994, the general body radiation field within the BORAX-I burial grounds area was < 0.1 mrem/hr.

Air Monitoring HI calculations performed for SL-1 indicate an HI well below 1, which is defined as a very low level of hazard from airborne activity. Air sampling is not required. If, during the course of construction, higher levels of contamination are uncovered, it may be determined by LITCO IH or RCT that air sampling may be required.

Table 7-2 - Contaminants of Concern and Surface Concentrations at BORAX-I[a]

Radionuclide	Concentration (pCi/g)
Cesium-137	1,817
Strontium-90	2.0
Uranium-235	68.6

a) Grab sample background concentrations for cesium-137 and strontium-90 from *Background Dose Equivalent Rates and Surficial Soil Metal and Radionuclide Concentrations for the Idaho National Engineering Laboratory*, INEL-94/0250, S.M. Rood, G.A. Harris, G.J. White, February 1995.

7.1.3 Material Safety Data Sheets

A copy of each MSDS of all hazardous materials being used during the project must be maintained at the job site office. All workers must be trained in the use and location of these MSDS.

Table 7-3 provides a listing of contaminants to be monitored.

Table 7-3 - Contaminants to be Monitored

Task or Assignment	Contaminant or Agent to be Monitored
Mobilization	-----
Site Preparation	Noise, dust, rad, heat stress
Earthwork	Noise, dust, rad, heat stress
Revegetation (grading)	Noise, dust, rad, heat stress
Fence Construction	Noise, dust, rad, heat stress
Decontamination	Noise, rad, heat stress
Demobilization	-----
Material Loading in Trucks	Noise, dust, heat stress
Material Transportation	Noise

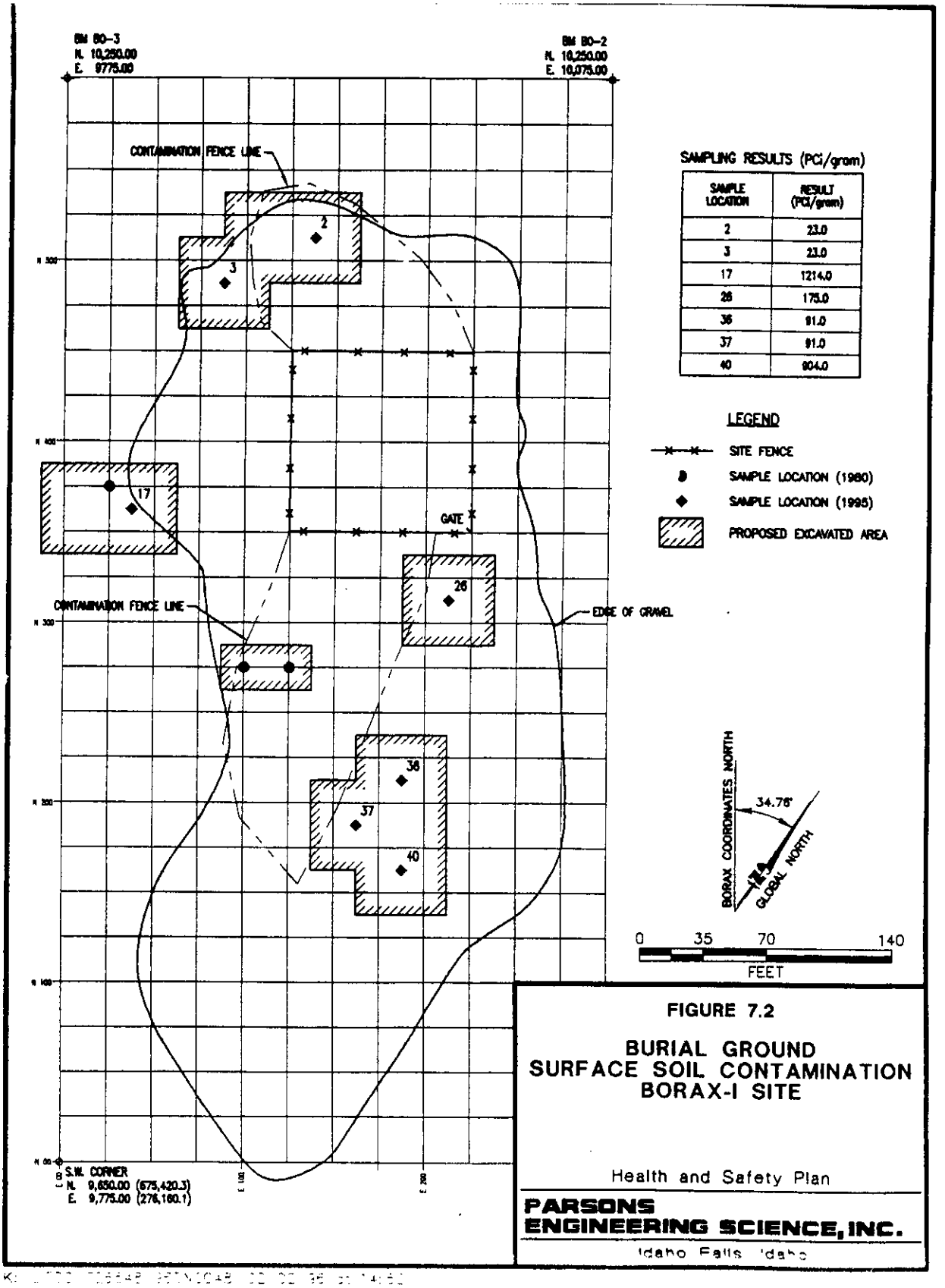

Figure 7-2 - BORAX-I Burial Ground Surface Soil Contamination

7.2 Environmental and Personnel Monitoring

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 7-4.

Table 7-4 - Task Site Activities and Associated Hazards

Activity or Task	Associated Hazards or Hazardous Agents
Mobilization	Lifting/back strain, moving heavy equipment, overhead hazards, falling objects, crushing/pinching, heat stress, noise
Site Preparation	Lifting/back strain, moving heavy equipment, overhead hazards, falling objects, crushing/pinching, heat stress, noise, dust, rad
Earthwork	Lifting/back strain, moving heavy equipment, overhead hazards, falling objects, crushing/pinching, heat stress, noise, dust, rad
Revegetation (grading)	Lifting/back strain, moving heavy equipment, overhead hazards, falling objects, crushing/pinching, heat stress, noise, dust, rad
Fence Construction	Lifting/back strain, moving heavy equipment, overhead hazards, heat stress, noise, dust, rad
Decontamination	Pressure system, rad, heat stress
Demobilization	Pressure system, rad, heat stress
Material Loading in Trucks	Moving equipment, noise, dust
Material Transport	Noise, vehicle transport, excessive speed, pedestrians

Air sampling will be conducted using NIOSH methods and according to the LITCO *Hazard Prevention and Control Manual*. The number, frequency, and sampling techniques will depend on the IH's assessment of potential exposures and risk assessment for work site personnel, in accordance with the LITCO *Hazard Prevention and Control Manual*. At the start of the project, all heavy equipment will be monitored for excessive noise levels. All personnel working with or in close proximity to heavy equipment with noise levels above 85 dB(A) will be required to wear hearing protection and to be enrolled in a hearing conservation program (see Table 3-1). Past projects involving moving dirt at the INEL have demonstrated that nuisance dust can be maintained below acceptable exposure levels, provided that adequate dust control methods are implemented (i.e., wetting, job shut down due to excessive wind levels). Dust monitoring will be conducted if dust control methods are suspected of being inadequate by the IH.

7.2.1 Industrial Hygiene and Radiological Monitoring

The equipment listed in Table 7-5 may be used by the IH/RCT on the work site to monitor chemical and radiological physical agents. All industrial hygiene radiological equipment will be maintained by the IH/RCT per the manufacturer's recommendations. Instruments will be calibrated per manufacturer's recommendations, or according to the schedule outlined in the LITCO *Hazard Prevention and Control Manual*.

Table 7-5 - Equipment to be Used for IH/RAD Monitoring[a]

Equipment	Agent to be Monitored
Sound level meter and/or noise dosimeter	Noise
Air sampling pump and appropriate filter	Dust and associated metals, including radiation
Heat stress monitor (wet bulb globe temperature)	Heat stress conditions: Temperatures > 90° F
TLDs	Beta-gamma radiation
Ludlum 61 or equivalent	Alpha emissions

Equipment	Agent to be Monitored
Ludlum 62 or equivalent	Beta-gamma emissions
Ion chamber instrument, RO 13A	Radiation dose rate
NaI detector with scaler/ratemeter[b]	Soil survey

a. Task-specific radiological monitoring will be conducted as prescribed by the applicable task Radiological Work Permit.

b. This detector calibration and use will be based on a to-be-developed LITCO procedure.

7.2.2 Radiological Monitoring

Radioactive contamination at the work site is outlined in Section 7.1. Additional surveys, smears, and other sampling will be performed when 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 confirm that waste items are sent to the appropriate disposal facility. Monitoring will be performed in accordance with the *INEL Radiological Control Manual*, as implemented in the *LITCO Radiological Control: Subject Area Manual MCPs*.

The RCT will be responsible for radiological monitoring in accordance with the LITCO *Radiological Control: Subject Area Manual*, MCP-139, "Radiological Surveys". All health physics equipment will be maintained and calibrated in accordance with MCP-93, "Instrumentation". Dosimetry monitoring shall be conducted as determined by the RWP and performed in accordance with MCP-3, "Tracking Radiation Dosimetry 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".

7.2.2.1 Personnel Radiological Exposure Monitoring

Baseline and/or annual whole body counts will be required of all Rad II workers for the project sites prior to their working in radiologically contaminated areas. Post job whole body counts may be required following completion of work. Respiratory protection and

dosimeter badges will be worn per the controlling RWP. To evaluate exposure to ionizing radiation, all personnel will be required to wear thermoluminescent dosimeters when working within the sites. The use of direct-reading dosimeter will be performed as specified on the controlling RWP (refer to EDF CFA-003, March 1996, and INEL Radcon Manual, Article 522, item 5).

7.2.3 Action Levels

To ensure worker safety at the work site, action levels have been set as indicated in Table 7-6. If levels of these contaminants reach the action level(s) noted, the corresponding action will be taken at the work site.

If beta/gamma contamination levels > 1000 disintegrations per minute (dpm)/100 cm^2 are encountered outside the areas of concern within the scope of this project, then they should be identified and action taken to either create another Waste Area Group to handle them or expand the scope of the existing project.

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 sections. Construction safety requirements found in 29 CFR 1926 are applicable and will be maintained.

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 CE or HSO if they experience any of the signs and symptoms of heat stress or observe that a work buddy is experiencing these symptoms. LITCO *Hazard Prevention and Control Manual,* PRD-77, *"Temperature Extremes,"* discusses the hazards of heat stress.

Table 7-6 - Action Levels for the Work Site

Agent Name	Action Level	Action Taken
Noise	>85 dB(A) instantaneous reading; monitor most exposed worker for 5-day minimum to establish baseline.	Use of hearing protection devices as prescribed by project IH; "Caution: Hearing Protection Required" posting of area determined to be >85 dB(A) during equipment operation. Utilization of an approved hearing conservation program.
Beta/Gamma emitting radionuclides	Contamination (removable) >1,000 disintegrations per minute per 100-cm^2 beta/gamma	Upgrade zone to "Contamination Area"; cease work; RCT evaluate PPE.
Alpha-emitting radionuclides	Contamination (removable) >20 disintegrations per minute per 100 cm^2 alpha	Upgrade zone to "Contamination Area," cease work; RCT evaluate PPE.
Radioactivity (dose rate)	> 60 μrem/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	Put on respirators.
Heat Stress	See Section 7.3.1	Modification of work environmental and rest cycles; provide shade access in zone for workers if air temp. >90° F.
Alpha, Beta/Gamma emitting radionuclides.	a. Facial or nasal contamination is detected that indicates a potential for internal contamination. b. Airborne monitoring indicates the potential for intakes exceeding 100 mrem committed effective dose equivalent. c. Upon direction of the Radiological Control Organization when an intake is suspected.	• Whole body count and in-vivo bioassay. • Modify work environment via alteration of Administrative and Engineering controls.

Monitoring for heat stress conditions shall be performed according to the LITCO *Hazard Prevention and Control Manual,* PRD-74, *"Working in Hazardous Temperatures".* Depending on the ambient weather conditions, work conditions, and physical response of work operations personnel, the IH will inform the JSS and CE 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 discontinue work activities, move to a shaded area to rest, be provided with cool drinking water, and be monitored by a Medic First-qualified person. Personnel exhibiting symptoms of heat stress who do not show signs of immediate recovery when removed to the rest area will be transported to the dispensary at the CFA 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 when work is done in the winter months, or at any time of year when the conditions are right. Relatively cool ambient temperatures and wet or windy conditions increase the potential for cold injury to personnel. The LITCO *Hazard Prevention and Control Manual*, PRD-74, discusses the hazards of cold

stress. Cold stress conditions will be monitored in accordance with LITCO *Hazard Prevention and Control Manual*, PRD-74.

7.3.2 Noise

Personnel employed at the work site may be exposed to noise levels in excess of 85 dB(A) during the operation of equipment. Noise monitoring will be performed by the IH per the LITCO *Hazard Prevention and Control Manual,* PRD-15, *"Hearing Conservation,"* to determine if workers have been exposed to noise above the allowable 8-hour time-weighted average of 85 dB(A). **Persons whose exposure exceeds the allowable level will be enrolled in the INEL or Subcontractor OMP Hearing Conservation Program**. Personnel assigned to 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

Explosion and fire hazards at the site are associated with diesel or gasoline used in equipment, with the energized system associated with office trailer equipment, vehicles, and with smoking. Designated flammable material, storage, and smoking areas will be posted, grubbed and graveled to provide a fire break. Smoking areas will be posted, with enforcement for butt disposal in Subcontractor provided cans. Fuel will not be stored at the work areas but delivered in DOT-approved fuel transport/storage systems. Fire extinguishers will be located at the work areas during all operations. No other flammable materials will be present and no other fuel hazards are anticipated. Flammable and combustible liquids will be handled per LITCO *Hazard Prevention and Control Manual,* MCP-584, *"Flammable/Combustible Liquids"*.

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

Handling Heavy Objects

Manual material handling will be minimized through task design and the use of mechanical and hydraulic lifts whenever possible. All operations personnel are cautioned to avoid lifting objects that are too heavy and to wear hand protection (i.e., leather gloves) as directed by the CE.

Power Tools

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 LITCO *Hazard Prevention and Control Manual*, PRD-2, will be followed for all work performed with power tools, including powered hand augers. No gas or diesel powered tool will be refueled while operating, or when hot equipment may create an explosion or fire hazard. Employees who employ powered hand augers shall be trained in their use, wear appropriate PPE, and discontinue work with the auger if there is a question regarding its safe use.

Moving Machinery and Falling Objects

Work site personnel may be subject to cuts and bruises, or become 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,
- Using mechanical assists whenever possible,
- Allowing no loose clothing or neck chains for security badges,
- Requiring long hair to be pulled back and secured when working around equipment with moving parts.

Electrical Hazards and 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 electrical 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; the LITCO *Hazard Prevention and Control Manual*, PRD-1, *"Electrical Safety"*; LITCO *Conduct of Operations Manual,* MCP-1059, *"Lockouts and Tagouts"*; and supplemental facility 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 LITCO *Hazard Prevention and Control Manual,* PRD-1, will be followed.

Work on energized systems will be minimized. If work on energized systems is necessary, the requirements in the LITCO *Hazard Prevention and Control Manual*, PRD-1, will be strictly enforced. There shall be qualified electrical backup personnel present whenever work on energized systems is done.

Portable electric tools and equipment also have the potential to cause shock or electrocution. Portable electrical tools will be ground fault circuit interruption 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 monthly inspection and testing program. The requirements in the LITCO *Hazard Prevention and Control Manual,* PRD-2, *"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. Any overhead electrical hazards will be identified by operating personnel prior to their raising the masts on drill rigs or using cranes. Minimum distances for working near overhead power lines, found in Table 9-3 of the DOE Handbook *Hoisting and Rigging*, will be followed. The requirements in the LITCO *Hazard Prevention and Control Manual*, PRD-1, 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, that clearance distance shall be marked on the signs.

Before beginning drilling or excavating operations, the Subcontractor will obtain underground utility clearances by contacting Telecommunications (526-1688 or 526-2512). The requirements for advanced notice of 48 hours will be met. LITCO MCP-151, "Subsurface Investigations," will be followed prior to any excavating.

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 LITCO *Conduct of Operations Manual*, MCP-1059, *"Lockouts and Tagouts"*.

Heavy Equipment

The hazards associated with the operation of heavy equipment include injury to personnel, damage to equipment, and/or damage to property. All heavy equipment will be used in the manner for which it was intended. Drivers will operate all equipment in accordance with the 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; those workers should maintain visual communication with the operator.

Personal Protective Equipment

Wearing PPE may 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, requiring administrative controls to alleviate the risk. Administrative and engineering controls will be used, where feasible, to minimize any risks associated with wearing PPE.

Elevated Work Areas

Personnel working on elevated equipment or at heights will use safety harnesses and lanyards (for work heights exceeding 6 ft) or safety nets (for work at heights exceeding 25 ft), per the LITCO *Hazard Prevention and Control Manual.* Personnel required to use fall-protection PPE shall be trained in its proper use, limitations, maintenance, and inspection.

Excavation, Trenching, and Shoring

Excavation work can pose a number of hazards. Specific hazards include cave-ins, engulfment, sudden subsidence of soil, breech of underground containers, and water accumulation. Work at the SL-1 and BORAX-I burial ground sites will involve excavation of approximately 12 inches in depth. Work in or near any excavation presents potential hazards; personnel protective systems, barricades, signs, and daily inspections are some of the safeguards required for excavation work. All excavations at the SL-1 and BORAX-I burial ground sites will be in accordance with the requirements of 29 CRF 1926, Subpart P, *"Excavations";* the LITCO *Hazard Prevention and Control Manual*, PRD-22, *"Excavations,"* and MCP-151, *"Subsurface Investigations"*.

Decontamination

Decontamination to remove contaminants from tools, equipment, and work site personnel will be performed using dry methods first and water if necessary, as directed by the LITCO Radiation Control Technician. Decontamination procedures, outlined in Section 9, must be followed and appropriate PPE must be used during decontamination activities.

Inclement Weather

In the event that adverse weather conditions, such as sustained strong winds (25 mph or greater), electrical storms, heavy precipitation, or extreme heat or cold, pose a threat to persons or property on the work site, the situation will be evaluated by the CE and JSS with input from the HSO, IH, safety engineer, RCT, and other personnel, as appropriate. A decision to discontinue all work at the work site will be made by the CE with input from the HSO, IH, RCT, and JSS, 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 CE or HSO of the hazards so that action can be taken to correct the condition. All corrective action and hazard identification will be noted in the CE logbook.

The CE and JSS will conduct daily inspections of the work site to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is prevented from accumulating on the site. These inspections will be noted in the CE logbook. Health and safety professionals present at the work site may, at any time, recommend changes in work habits to the JSS or CE.

Individuals working at the work 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 duties.

SECTION 8

PERSONAL PROTECTIVE EQUIPMENT

PPE that will be used at the work site will be 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 the hazard analysis in Section 7 of this HASP. Table 8-1 lists each task or assignment and the corresponding level of PPE required.

8.1 Level D - Personal Protective Equipment

Level D PPE 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 has four sublevels for this project, consisting of:

Level D1: street clothes.

Level D2: Construction clothes consisting of:

- Coveralls,
- Leather work gloves as needed,
- Hard hats, as required by safety engineer,
- Eye protection (see LITCO *Hazard Prevention and Control Manual,* PRD-86),
- Safety footwear (steel or protective toe and shank),

Level D3: Level D2 protection plus anti-contamination coveralls, boot covers, and gloves.

Level D4: Level D3 protection, plus splash suit/face shield.

PPE must be inspected by the user prior to donning it and before entry into the work zone. Items found to be defective will not be used.

Table 8-1 - Level of Personal Protective Equipment and Modifications for Specific Tasks

No.	Task or Assignment	Level of PPE	Potential Upgrade
1	Mobilization	Level D1	Level C As determined by IH/RCT
2	Site Preparation	Level D3	Level C As determined by IH/RCT
3	Excavation of Borrow Soil	Level D2	None
4	Excavation of Rad Contaminated Soils	Level D3	Level C As determined by IH/RCT
5	Erosion Protection	Level D3	As determined by IH/RCT
6	Decontamination	Level D4	As determined by IH/RCT
7	Demobilization	Level D2	Level D

8.2 Level C - Personal Protective Equipment

Level C PPE is appropriate for use at the task site when the contaminants are well-characterized and personnel can be protected using air purifying respirators; there is minimal hazard exposure to personnel via skin absorption, and very little danger that an immediately dangerous to life or health condition will develop. Personnel working at the task site who are assigned Level C PPE shall wear:

- Full-face air-purifying respirator with appropriate filter (i.e., HEPA, organic, or combination),
- Chemical-resistant (impermeable Tyveck) coveralls and/or anti-contamination clothing as specified on the RWP,
- Steel or protective toe and shank boots,
- Chemical-resistant (butyl or olefin rubber) outer shoe/boot cover,
- Inner gloves (latex),
- Outer gloves (nitrile),
- Hard hat (as required by the safety engineer).

SECTION 9

DECONTAMINATION PROCEDURES

9.1 PPE Decontamination

For Level D PPE, decontamination of personnel at each site will require that employees soap and water wash immediately after exiting the exclusion zone and before eating, drinking, smoking, etc. A wash station consisting of a soap and tap water wash basin and a tap water rinse basin will be installed at each decontamination area. A separate set of wash basins will be set up for sampling equipment decontamination. Shower facilities will not be available at the work site; the nearest shower facilities will be used in case of an emergency.

9.2 Decontamination of Personnel and Equipment

If residual material does come into contact with the skin, the affected areas will be washed with soap and water until no evidence of solid chemical remains. In case of eye contact, the eyes will be rinsed immediately with large amounts of water or normal saline solution; the employee must occasionally lift both upper and lower lids. Flushing will continue for 20 minutes. Following washing or rinsing, the affected person will be transported to the nearest medical facility for additional attention and treatment. The Subcontractor JSS or HSO will inspect the portable eye wash station available at each work site daily to verify that a sufficient volume of solution is available to maintain a constant flow for 20 minutes. The eyewash shall be tested performed by the CE, JSS, or HSO to verify operation of the unit prior to commencement of work.

Radiological decontamination of personnel shall be executed under the direct supervision of a LITCO radiological engineer or radiological contamination (RADCON) technician in accordance with Chapter 5 of the INEL *Radiological Control Manual*, Section 10.4. Chemical decontamination of personnel shall be performed under the direct supervision of LITCO industrial hygiene personnel. All decontamination operations for equipment and areas shall be performed in accordance with Chapter 4 of the INEL *Radiological Control Manual*. Personnel and personal property decontamination procedures that will be used include:

- Dry methods such as brushing, sweeping, scrubbing with wire brush,
- Tape,
- Vacuuming (Vacuum must be equipped with a high-efficiency particulate air filter. HEPA filters must be pre-approved by RCT/IH in accordance with LITCO PRD-71, *HEPA Filters)*,
- Washing with soap and water,
- Applying other approved techniques.

9.2.1 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 INEL *Radiological Control Manual* contains information on proper handling of radiologically contaminated wounds.

9.2.2 Equipment Decontamination and Disposal of Contaminated Materials

All equipment and tools used in a potentially radiologically contaminated area will be frisked for contamination prior to removal from the site/project. Equipment which comes in direct contact with potentially contaminated soil will either undergo decontamination to meet the requirements of Chapter 4 of the INEL *Radiological Control Manual* prior to release, or be controlled for sole use as radiologically controlled equipment.

Decontamination equipment, materials, and supplies are generally selected based on availability; other considerations are ease of equipment decontamination or disposal. Soft-bristle scrub brushes or long-handle brushes are used to physically remove contaminated materials from surfaces. Water and detergent, or solvents, are to be used in this process with buckets or garden sprayers used for rinsing. Large plastic tubs can hold wash and rinse solutions. Large plastic garbage cans or other similar containers lined with plastic bags may

be used to store contaminated clothing and equipment. Contaminated liquids and solids can be stored temporarily in metal or plastic cans or drums. Other gear includes paper or disposable towels for drying protective clothing and equipment.

All materials and equipment used for decontamination must be disposed properly in accordance with the approved ER Waste Certification Plan and the RRWAC. Clothing, tools, buckets, brushes, and all cleaning solutions and spoils must be secured in drums or other containers, and labeled correctly for transportation and disposal.

9.2.3 Site Sanitation and Waste Minimization

Work site personnel will use portable toilet facilities located at the work site within the support zones. Portable water and soap will also be available at the site for personnel to wash their hands and faces upon exiting the exclusion zone. It is important to note that any required radiological contamination surveys must be performed **prior** to the employees' washing their faces 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 non-contaminated 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.

SECTION 10

EMERGENCY RESPONSE PLAN FOR WORK SITE

The methods and signals that will be used to alert work area personnel to discontinue work and evacuate the work site include voice, hand signals, alternating siren warnings, or three blasts from a hand-held air horn or vehicle horn. The site personnel will use radio methods for summoning emergency assistance to the work site. The location of take-cover and evacuation areas, and the types of signals to be used for the day will be communicated during the daily POD meeting. Location and signal types will be determined by task type and weather conditions for a particular day. The hand signal to heavy equipment operators for take-cover situations will be the choke hold signal. Table 10-1 lists the responsibilities at the work site during an emergency event.

The take-cover signal shall be a steady blast of a vehicle horn. The take-cover location where personnel will assemble in the event of a Site-wide take-cover alarm is the job trailer, or as determined in the POD meeting.

The evacuation sign shall be the intermittent blast of a vehicle horn. The location where work site personnel will assemble following an evacuation of the work site is the support zone, or as determined in the POD meeting. Personnel will then evacuate by private vehicles, to the front gate at PBF (for SL-1 site) or to the guard gate at RWMC (for BORAX-I site), unless the employees are notified otherwise.

At least two persons with current Medic First training will be present at each 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 material is noticed, work site personnel shall comply as listed in Table 10-2.

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

Table 10-1 - Responsibilities During an Emergency

Responsible Person	Action Assigned
CE, JSS	Signal evacuation
CE	Contact Safety/IH/RCT
CE	Call Warning Communication Center (WCC)
CE, work site personnel	Provide first aid to victims
CE	Contact area Emergency Action Manager or coordinator
CE	Contact OMP
Work site personnel	Initiate spill containment
CE	Undertake spill reporting (pager 6400)

Table 10-2 - Spill Response Action

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** CE 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 CE 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.

10.1 Emergency Equipment on the Site

The Subcontractor will be responsible for providing an emergency eyewash station, decon stations, fire extinguishers, communication systems, and first aid kits at each work site. If it is determined that self-contained breathing apparatus is necessary, at least two sets must be available to allow a rescue team of two persons to enter the site.

The INEL Fire Department has a mutual aid agreement with the Idaho Falls, Blackfoot, and Arco Fire Departments. The nearest emergency response team is the INEL Fire Department, located at the CFA-666. This team has response capability to effectively assist in medical emergencies, fires, or hazardous material spills. An emergency drill will be conducted by the CE at the beginning of the project.

Figure 10-1 shows the route to CFA 690, which is the nearest medical facility. Because of the remote locations of the sites, project personnel will depend on radio or cell phone contact with the emergency response team for directions concerning the locations of take-cover stations, facility evacuation routes, and pickup routes.

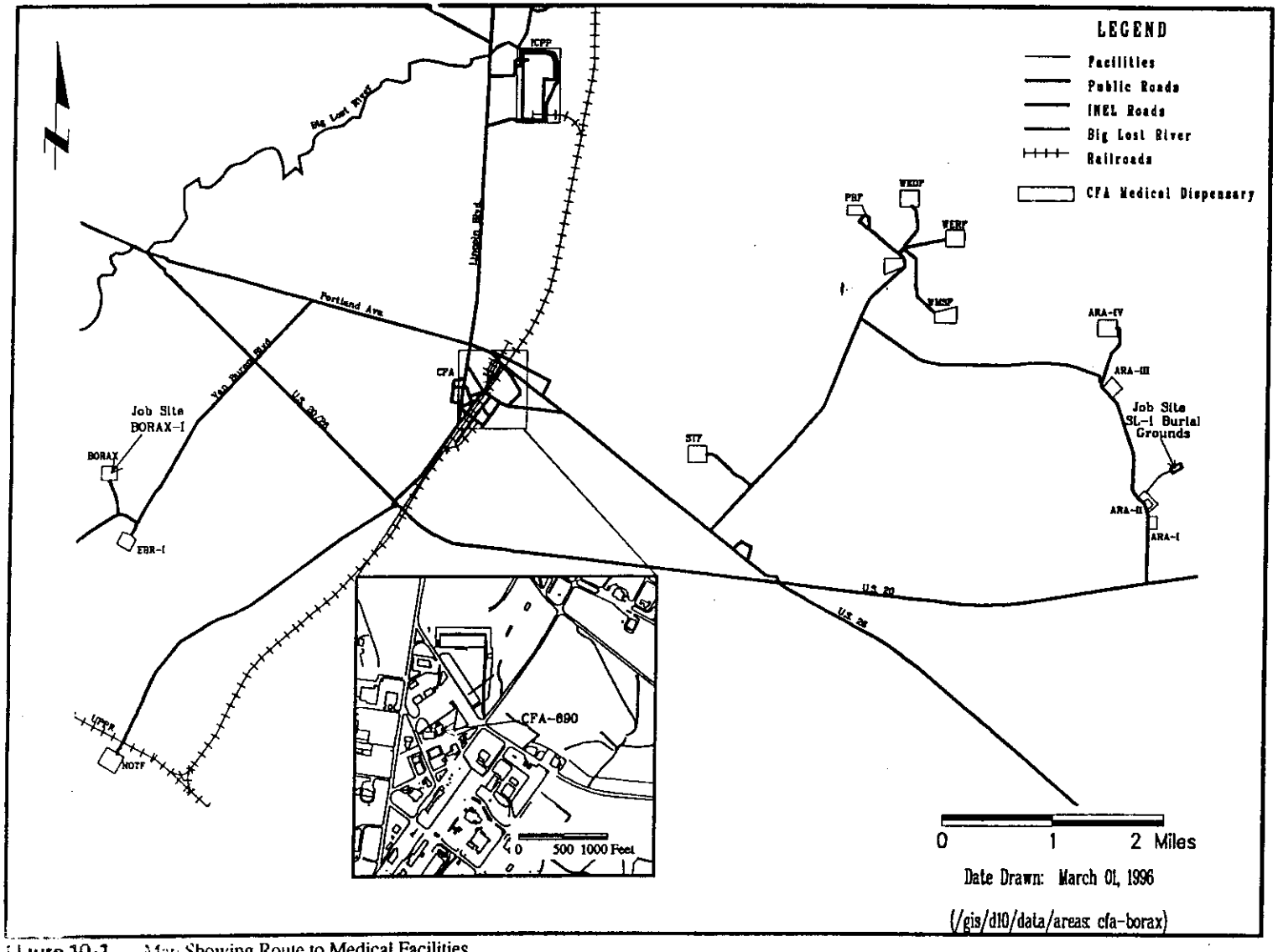

Figure 10-1. Map Showing Route to Medical Facilities.

Figure 10-1 - Map Showing Route to Medical Facilities

10.2 Telephone/Radio Contact Reference List for SL-1/BORAX-I, Operable Units 5-05/6-01

This reference list will be posted at the entrance of the contamination reduction corridor and at the offices of those persons assigned notification responsibilities. Anyone using a cellular phone must call WCC directly at 526-1515.

• Warning Communication Center (WCC)	777 Radio: KID-240
• CFA Area Emergency Action Manager	Contact through the WCC
• First Aid CFA Dispensary, Building 603	777 526-2356
• Occupational Medical Program (CFA Dispensary)	526-2356
• Fire/Security	777
• CFA Facility Manager, LITCO Gary Braun	526-2830
• Project Manager, LITCO Doug K. Jorgenson Chris M. Hairing	 526-7022 526-2719
• Project Manager, Parsons ES Joe Rothermel	526-5776 Pager # 7700
• Construction Manager, Parsons ES Barry Bolton	526-5176 Pager # 6523
• Construction Area Engineer, Parsons ES Max Lapioli	526-6601 Pager # 5659
• ER ES&H Coordinator, LITCO Roger Jones	526-8590 Pager # 6519
• EO S&H Supervisor, LITCO Jim Durrant	526-6562 Pager # 5747
• LITCO Industrial Hygiene/Safety Lance Gurney	526-8551 Pager # 6768
• LITCO Radiological Control Supervisor George W. Clarke	526-3565 Pager # 5797

SECTION 11

REFERENCES

DOE Handbook - Hoisting and Rigging, June 1995.

LITCO, *Company Procedures Manual,* (EG&G Idaho, Inc.), current issue.

LITCO, *Conduct of Operations Manual,* current issue.

LITCO, *Hazard Prevention and Control Manual,* current issue.

LITCO, *Industrial Hygiene Manual,* (EG&G Idaho, Inc.), current issue.

LITCO, *Management Plans for the EG&G Idaho Environmental Restoration Program,* (EG&G Idaho, Inc.), current issue.

LITCO, *Quality Program Plan for the Environmental Restoration Program,* (QPP-149, EG&G Idaho, Inc.), current issue.

LITCO, *Radiological Control: Subject Area Manual,* current issue.

LITCO, *Radiological Control Manual,* current issue.

MacLeod, S.E., *Radiological Air Monitoring Hazardous Index (HI) for Remediation of SL-1/BORAX-I Burial Grounds*, EDF CFA-003, March 1996.

NIOSH, *Pocket Guide to Chemical Hazards,* NIOSH/CDC/EPA, DHHS (NIOSH) Publication No. 94-116, June 1994.

Rood, S.M., et al., *Background Dose Equivalent Rates and Surficial Soil Metal and Radionuclide Concentrations for the Idaho National Engineering Laboratory*, INEL-94/0250, February 1995.

SECTION 12

HEALTH AND SAFETY PLAN TRAINING ACKNOWLEDGEMENT

The signatures below certify that:

- The employee has reviewed a copy of the HASP for the OU 5-05/6-01, SL-1 and BORAX-I Engineered Barriers, and that questions and concerns regarding the 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 OU 5-05/6-01, SL-1 and BORAX-I Engineered Barriers (Section 7, "Hazard Evaluation").

- 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.

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

Print	Signature	Org.	Date

Construction Engineer's name (printed) and signature:

Print	Signature	Org.	Date

Employee's name (printed) and signature:

Print	Signature	Org.	Date

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SECTION 13

HAZWOPER 24 HOUR ON-THE-JOB TRAINING 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 (during daily Plan of the Days meetings). For LITCO and Parsons ES employees, the signed form is to be submitted to the LITCO EO Training Coordinator at MS 3902 and a copy maintained in the field project files.

Project: **SL-1 and BORAX-I Engineered Barriers**

- ☐ Knowledge of names of personnel and the alternates responsible for project safety and health.
- ☐ Knowledge of safety, and 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