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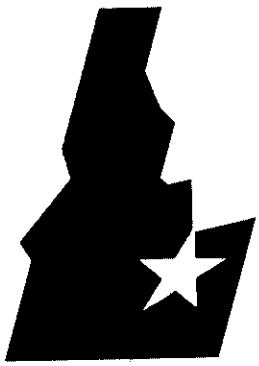

Idaho National Engineering Laboratory

Managed by the U.S. Department of Energy

HEALTH AND SAFETY PLAN FOR OPERATIONS PERFORMED FOR THE ENVIRONMENTAL RESTORATION PROGRAM

TASK: OU 1-03 AND OU 4-10 TRACK 2 INVESTIGATIONS

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Note: This Health and Safety Plan incorporates the Health and Safety Plan for Operations Performed for the Environmental Restoration Program, (EGG-WM-8771, Revision 2), with Appendix A completed for the OU 1-03 and OU 4-10 Track 2 Investigations.

HEALTH AND SAFETY PLAN
FOR
OPERATIONS PERFORMED FOR THE
ENVIRONMENTAL RESTORATION PROGRAM

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Prepared for the
U.S. Department of Energy
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HEALTH AND SAFETY PLAN
FOR
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ENVIRONMENTAL RESTORATION PROGRAM

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6-21-91
Date

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6/21/91
Date

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6/21/91
Date

DOE-ID approval letter for this Health and Safety Plan is attached to DRR number ERP-340, dated 6/21/91.

ABSTRACT

This document constitutes the generic health and safety plan for the Environmental Restoration Program (ERP). It addresses the health and safety requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 standard; and EG&G Idaho, Inc. This plan is a guide to individuals who must complete a health and safety plan for a task performed for the ERP. It contains a task specific addendum that, when completed, specifically addresses task specific health and safety issues. This health and safety plan reduces the time it takes to write a task specific health and safety plan by providing discussions of requirements, guidance on where specific information is located, and specific topics in the Addendum that must be discussed at a task level. This format encourages a complete task specific health and safety plan and a standard for all health and safety plans written for ERP.

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ACRONYMS, ABBREVIATIONS, and DEFINITIONS

Acronyms:

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
anti-c	Anti-contamination
CA	Compliance Assurance
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COCA	Consent Order and Compliance Agreement
CPR	Cardiopulmonary Resuscitation
DOE	Department of Energy
DOE-ID	Department of Energy - Idaho Operations Office of DOE
DOP	Detailed Operating Procedure
DOT	Department of Transportation
DRD	Direct Reading Dosimeter
DRR	Document Revision Request
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FTL	Field Team Leader
H&S	Health and Safety
HAZMAT	Hazardous Materials Response
HPT	Health Physics Technician
HSO	Health and Safety Officer
HW	Hazardous Waste
IAG	Interagency Agreement
IH	Industrial Hygienist
INEL	Idaho National Engineering Laboratory
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheets
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PD	Program Directive
PM	Project Manager
PPE	Personal Protective Equipment
QE	Quality Engineer
QPP	Quality Program Plan
QAPjP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RE	Radiological Engineer
SAP	Sampling and Analysis Plan
SCBA	Self-contained Breathing Apparatus
SE	Safety Engineer

SOP	Standard Operating Procedure
SSWP	Special Safe Work Permit
SWIMS	Solid Waste Information Management System
SWP	Safe Work Permit
TLD	Thermoluminescent Dosimeter
TRU	Transuranic
USCG	United States Coast Guard

Abbreviations:

NIOSH, 10/85--NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

Definitions:

Action Limit--Any physical, chemical, or radiological limit set by a regulatory agency, EG&G Idaho, Inc., or safety individual at the task site.

Area--A geographic subdivision of the INEL or a location outside the INEL dependent on the INEL for logistical or administrative support (e.g., TAN, TRA, CFA, IF).

Facility--The minimum complete and usable unit of Real Property designed to contain an organizational unit or operational function (e.g., building, central steam station).

Hazardous Material Response (HAZMAT) employee--Member of a group of employees, designated by management, who is expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The HAZMAT Team performs responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of an incident. A HAZMAT Team is not a fire brigade nor is a typical fire brigade a HAZMAT Team. A HAZMAT Team, however, may be a separate component of a fire brigade or fire department.

Task Site--Immediate working area where ERP task operations are being performed.

HEALTH AND SAFETY PLAN FOR OPERATIONS PERFORMED FOR THE ENVIRONMENTAL RESTORATION PROGRAM

1. INTRODUCTION

This Health and Safety (H&S) Plan for operations performed for the EG&G Idaho, Inc. Environmental Restoration Program (ERP) establishes the procedures and provides general guidelines to minimize health and safety risks to the worker and public. This plan, in conjunction with associated task specific information required by this plan, shall be used during selected activities aimed at assessing and remediating past hazardous waste and/or hazardous substance disposal at the Idaho National Engineering Laboratory (INEL).

This H&S Plan and the associated task specific addendum required by this plan shall be in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120 standard governing hazardous waste operations. It has been prepared in recognition of and is consistent with the NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985 (hereafter referenced as NIOSH, 10/85); the EG&G Idaho Company Procedures Manual; the EG&G Idaho Safety Manual; and the EG&G Idaho Radiological Controls Manual.

This H&S Plan shall be used when work is performed at ERP task investigation sites by employees of EG&G Idaho, subcontractors to EG&G Idaho and employees of other firms, and Department of Energy (DOE) Laboratories. Occasional visitors and oversight personnel [DOE, State of Idaho, and Environmental Protection Agency (EPA) representatives] are subject to the requirements of Section 2.16 of this plan.

1.1 H&S Plan Task Specific Addendum

This H&S Plan must address the many diverse conditions encountered for each task included in the ERP investigations. Therefore, an addendum shall be written for each task that requires an H&S Plan. The task addendum shall include any additions, omissions, or modifications to the main body of this H&S Plan that can individualize this plan into a task specific plan. The task specific plan need not repeat EG&G Idaho or ERP procedures for safety and health. However, these procedures shall be referenced in the Addendum.

NOTE: If an existing document meets the intent of the task specific plan [e.g., Detailed Operating Procedure (DOP)], it may be attached as the Addendum to this H&S Plan. The following statement must then be included at the beginning of the task specific addendum: "The information contained in this document contains all the elements required by the task specific addendum and therefore replaces the stated addendum." If an existing document is used for the addendum, it does not have to be in the specified format of the addendum. The task specific H&S Plan will be considered complete when the H&S Plan task addendum is reviewed and approved per ERP Program Directive (PD) 2.2.

Upon request, a copy of this generic H&S Plan and an electronic copy of the generic H&S Plan task specific addendum may be obtained from the ERP Administrative Record and Document Control Office (ARDC, 526-2650). At a minimum, the generic H&S Plan shall be reviewed annually and revised as required; therefore the requester shall verify the revision number of the generic H&S Plan with ARDC. The electronic copy of the task specific addendum is provided as a guide in producing a task specific H&S Plan. Pertinent topics referencing the main body of this H&S Plan are provided in the electronic copy of the blank H&S Plan task specific addendum to aid the author in writing a complete task specific H&S Plan.

When the electronic guide is used to produce a task specific addendum, each topic must be evaluated to determine how it applies to the specific task requiring the addendum. If the topic does not apply to the subject task, "N/A" shall be written in that portion of the task specific addendum. If additional information is required to make a complete task specific H&S Plan, additional blank pages may be added at the end of the task specific addendum. All technical information requested in the addendum must be obtained from knowledgeable individuals associated with the specific task [e.g., monitoring equipment information should be obtained from the task radiological engineer (RE) and/or industrial hygienist (IH)]. Once a task specific addendum is completed in accordance with ERP PD 4.4 and reviewed and approved in accordance with ERP PD 2.2, it shall be sent to ARDC, appended onto the generic H&S Plan and processed. ARDC is responsible for maintaining the electronic copy and originals of the task specific H&S Plans.

Any modifications to an approved task specific plan shall be implemented through a Document Revision Request (DRR), as described in ERP PD 4.1. If the change is made in an existing document used as a task specific plan but the document is not an ERP document, the changes will be made in accordance with the directives of the program/facility responsible for the document. Documentation of any changes made to documents external to ERP must be provided to ARDC.

1.2 Site Description

INEL is a multipurpose laboratory originally established in 1949 by the U.S. Government, under the direction of the Idaho Operations Office of the Department of Energy (DOE-ID). The primary mission of INEL is to support the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, and energy technology/conservation programs.

INEL, formerly the National Reactor Testing Station (NRTS), encompasses 890 square miles and is located approximately 20 miles west of Idaho Falls, Idaho (Figure 1-1). The United States Atomic Energy Commission, now DOE, established the NRTS in 1949 as a site for building and testing a variety of nuclear facilities. INEL has also been the storage facility of transuranic (TRU) radionuclides and low-level radioactive wastes since 1952. DOE-ID has responsibility for the INEL and designates authority to operate the INEL to government contractors. The primary contractor for DOE-ID at INEL is EG&G Idaho, Inc. which provides managing and operating services to the majority of INEL facilities. Other contractors who operate facilities at the INEL but are not covered by this H&S Plan include Westinghouse Idaho Nuclear Company, Argonne National Engineering Laboratory, Westinghouse Electric Corporation, and Rockwell Corporation.

Tasks being performed for the ERP are scattered throughout INEL, and detailed facility or task site descriptions are too numerous to include in this generic portion of the H&S Plan. Therefore, specific facility and/or task site descriptions shall be provided in the task specific addendum.

1.3 Scope of Work

ERP supports the following objectives identified in Chapter 2 of the Management Plan for the EG&G Idaho Environmental Restoration Program:

- Identify and remediate all past waste units presenting a potential threat to human health or the environment.

- Comply with the Consent Order and Compliance Agreement (COCA), which will be the integration document for INEL cleanup activities, by implementing the COCA Action Plan. Comply with the Interagency Agreement (IAG) when approved by DOE, Environmental Protection Agency (EPA) Region 10, and the State of Idaho.

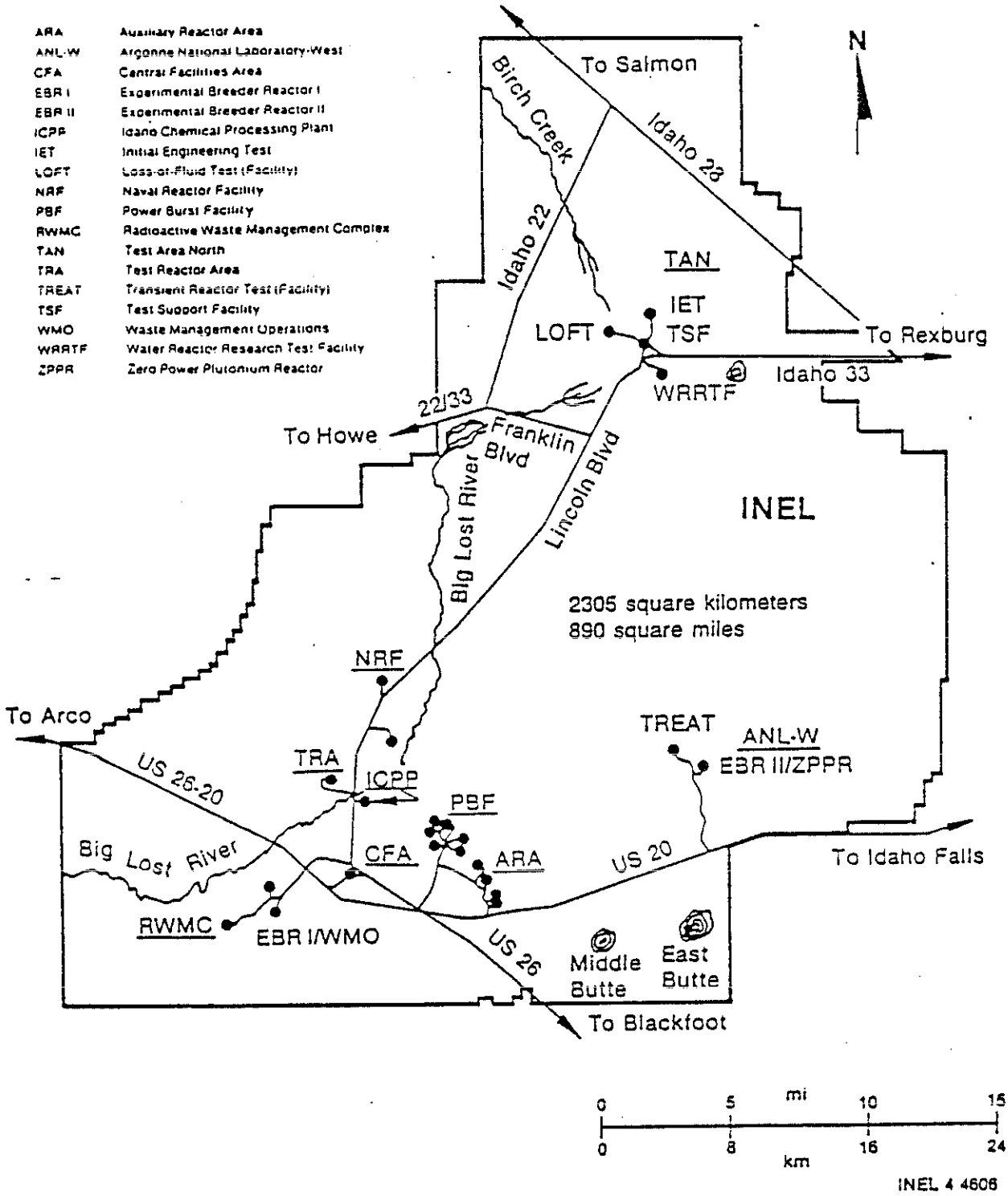

Figure 1-1. Map of INEL showing location of the major facilities.

- Comply with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) as established in an IAG among DOE-ID, EPA, and the State of Idaho.

- Support the DOE Environmental Restoration Program, as directed by DOE Headquarters in Washington, D.C.

A detailed work scope shall be included in the task specific addendum.

Field activities conducted during investigations may result in an exposure to hazardous and/or radioactive materials or wastes resulting from direct contact with contaminated soil, rock, groundwater, airborne particulates, and vapors. Protecting task site personnel from occupational health and safety hazards will be of major concern during the field activities. To this end, the ERP has identified a number of subjects that will provide protection to personnel and the environment. The following major subjects are addressed:

- Health and safety responsibilities

- Personnel training

- Medical surveillance program

- Hazard evaluation

- Levels of protection and use of personal protective equipment (PPE)

- Safe work practices

- Establishment of work zones, site entry, and security procedures

- Personnel and environmental monitoring and record keeping requirements
- Decontamination procedures
- Emergency procedures, equipment, and information.

Each subject is detailed in the following sections.

2. HEALTH AND SAFETY RESPONSIBILITIES

Direct implementation of the H&S Plan is the responsibility of the Field Team Leader (FTL). The FTL and/or Project Manager (PM) shall determine the task organizational structure and expertise required to perform the task while minimizing any risks to personnel health and safety. Expertise that may be required for the task includes but is not limited to industrial hygiene, health physics, industrial safety, and essential technical skills. The FTL shall develop a task organizational chart that identifies all key personnel. Both lines of command and lines of communication shall be identified by the task organizational chart (see Figure 2-1). The task organizational chart shall be located in the addendum. A qualified person may act in dual positions for a task [e.g., IH and health and safety officer (HSO)]. An HSO shall always be identified for a task per the requirements of OSHA 1910.120. The following subsections outline the responsibilities of the most common key personnel. If warranted by the requirements of the task, additional specialized positions may be necessary.

2.1 Field Team Leader

The FTL, the individual overseeing task activities, has ultimate responsibility for the safe and successful completion of task activities and for all phases of safety at the task site. If operations have been halted due to a potentially hazardous health and safety issue, the FTL will confer with the IH, HSO, RE, PM, health physics technician (HPT), safety engineer (SE), and facility representative, as required by the situation, to provide a safe solution to the problem. In addition, the FTL must remain responsive to health and safety issues raised by task operations personnel.

The FTL will ensure an orientation meeting is conducted before the start of a task to review and discuss operating procedures and the Task Specific H&S Plan (including any attachments) with task operations personnel. If new team

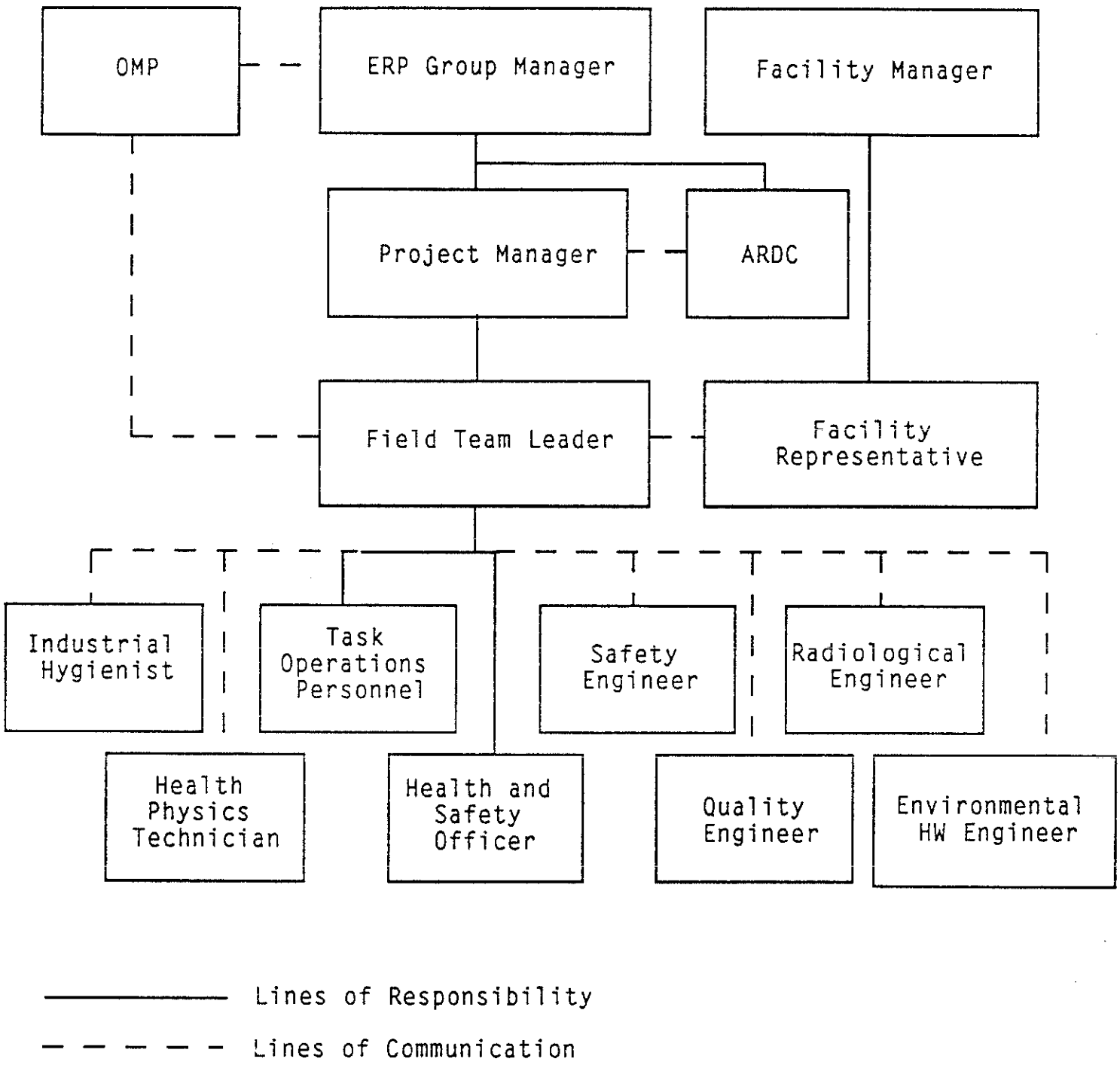

Figure 2-1. Field organizational chart.

members arrive at the task site after initiation of the task, the FTL shall ensure this orientation is presented to them.

At the beginning of each work day, the FTL (or alternate) will meet with task operations personnel to discuss the day's activities and address any health and safety issues that may have arisen or potentially could arise that day.

The FTL will ensure that all task operations personnel have received the appropriate training as required by Section 3 of this H&S Plan and that records of training for ERP personnel (including a copy of the signed Health and Safety Certification form as shown in the addendum) are submitted to the Training and Emergency Action Unit of the Waste Management Operations Support Group.

Additional responsibilities of the FTL include:

- Halting or modifying any task and/or evacuating the task site if work conditions are considered unsafe. This decision will be made after consulting with the HSO, IH, SE, and/or RE, as appropriate

- Reporting any accident, illness, or safety-related occurrence in accordance with Section 3 of the EG&G Idaho Safety Manual.

- Notifying the facility representative (if applicable) of any modifications or suspension of the task

- Ensuring that an interface exists with the analytical laboratories regarding any analyses of personnel monitoring and/or ambient air samples and provisions are made with the laboratory for a 24 to 48-hour turnaround for analysis in the event of an exposure suspected of being above an action level.

- Ensuring that all task site personnel understand and comply with all safety requirements

- Initiating corrective action for observed safety violations

- Ensuring that safety training is implemented as described in this plan (Section 3).

An FTL not at the task site must appoint an appropriate alternate to act as FTL. This change must be communicated to the facility representative, when necessary, and recorded in the FTL logbook. Appropriate alternates shall be listed in the task specific addendum.

2.2 Health and Safety Officer

The HSO is responsible for ensuring compliance with and the execution of the health and safety procedures described in this plan and the associated task specific addendum. The HSO will be supported by those personnel necessary to effectively implement the task specific H&S Plan and verify compliance (e.g., SE, IH, HPT, RE, and facility representative).

Responsibilities of the HSO include:

- Ensuring that all necessary safety equipment is located on or near the task site and properly maintained and calibrated by the appropriate personnel.

- Observing task site activities and reporting any deviations from the H&S Plan to the FTL

- Initiating contact with the INEL emergency response agencies (security, fire, medical) at the beginning of the task, ensuring personnel and environmental monitoring requirements are established

by the IH and RE (Section 9), and testing the emergency phone numbers to ensure accuracy.

2.3 Industrial Hygienist

The IH is the primary source of information regarding health issues at the task site. The IH is responsible for operations and maintenance of all monitoring equipment with the exception of radiological equipment and will maintain a daily logbook of monitoring activities. The IH will conduct task site health hazard assessments and advise the FTL on adequate health protection for task operations personnel. The IH will advise the FTL on changes to monitoring or PPE requirements throughout task activities and on any conditions necessitating task site evacuation and permitting personnel reentry to the task site.

The IH is responsible for designing a practical monitoring program to determine worker exposures to hazardous substances. The IH will also log results from field samples and observations.

NOTE: Much uncertainty is involved as to the chemical hazards that may be encountered. Not everything can be monitored, and professional judgment must be exercised at all times.

The IH shall aid the FTL in identifying employees experiencing adverse health effects that may have resulted from exposure to hazardous substances and environments and identifying such workers to the Occupational Medical Program (OMP).

2.4 Health Physics Technician

The HPT is the primary source of information and guidance with regards to radiological hazards. The HPT will be present at the task site before

operations begin and at any point during task operations when a radiological hazard to operations personnel may exist or is anticipated.

Responsibilities of the HPT include:

- Ensuring radiological equipment is calibrated and functioning properly
- Radiological surveying of the task site, equipment (before and after decontamination), and samples
- Collecting and analyzing smears
- Providing guidance and monitoring decontamination of equipment (radiological contaminants)
- Providing the FTL, OMP, and RE with radiological monitoring information as requested
- Immediately notifying the FTL of any radiological occurrence that must be reported as directed by the EG&G Idaho Safety Manual, Section 3, Appendix II.
- Accompanying victim to the nearest INEL Medical Facility for evaluation if significant radiological contamination occurs.

2.5 Radiological Engineer

The RE is the primary source of information and guidance for radiological controls imposed on a task. The RE will make recommendations to minimize health and safety risks of task operations personnel if a radiological hazard exists or occurs at a task site.

The responsibilities of the RE include:

- Performing radiation exposure estimates using information provided by cognizant engineers, area HPTs, history of past work evaluations, bioassays, FTLs, etc.

- Identifying the type(s) of radiological monitoring equipment necessary to maintain safe working conditions for task operations personnel

- Attending pre-job briefings if required by the FTL

- Advising FTL and HPT of changes in monitoring or PPE and task site evacuation and reentry.

2.6 Administrative Record and Document Control Office

The ARDC is responsible for organizing and maintaining data and reports (safety, sampling, and operations) generated by ERP investigations. ARDC maintains a supply of all controlled documents and provides a documented checkout system for the control and release of controlled documents, reports, and records. A copy of the H&S Plan and the associated electronic copy of the task specific addendum are available upon request by calling 526-2650.

2.7 Occupational Medical Program

The OMP is mandated by DOE 5480.8 and uses the sciences related to preventive medicine and environmental health to determine the effects of environmental stress on human health or disease.

The OMP has responsibilities in the following areas:

- Review and comment on INEL emergency plans and operations

- Provide diagnosis, medical opinion, and treatment for INEL employees with occupational or nonoccupational illness or injuries

- Assist in the documentation and investigation of work-related illnesses or injuries

- Provide medical opinion whenever there is doubt by the FTL, advisors, or employee of the ability of the employee to perform assigned work or work being considered for assignment

- Plan and provide emergency medical care in support of individuals and Area emergency actions

- Maintain and operate a radiation and chemical decontamination facility at Central Facilities Area (CFA)

- Provide medical surveillance of workers who are identified by an IH as having been or are likely to be exposed over action levels to specific hazardous environments or substances.

2.8 Facility Representative

The facility representative serves as the Area Landlord representative and is responsible for the safety of personnel and safe completion of all project activities conducted within his/her Area. Therefore, the facility representative will be kept informed of all activities performed in the Area. Where applicable, the facility representative and FTL shall agree upon a schedule for reporting task progress and plans for work. The facility representative will serve as advisor to task operations personnel with regard to the Area operations when the task is performed in his/her Area.

2.9 ERP Group Manager

The ERP Group Manager is responsible for investigation and remediation activities performed by ERP. This manager provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ERP Group Manager ensures that all activities are conducted in accordance with DOE, EPA, and State of Idaho requirements and agreements; monitors and approves program budgets and schedules; ensures the availability of necessary personnel, equipment, subcontractors, and services; and provides direction for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports. The ERP Group Manager has primary responsibility for the technical quality of all projects and safety of personnel.

2.10 Project Manager

The PM has the responsibility for ensuring that all tasks conducted during the project are in compliance with the Management Plan for the EG&G Idaho Environmental Restoration Program and all applicable OSHA, EPA, DOE, Department of Transportation (DOT), and State of Idaho requirements. The PM is responsible for ensuring tasks comply with the ERP Quality Program Plan (QPP) (QPP-149), Quality Assurance Project Plan (QAPjP), H&S Plan, PDs, and Sampling and Analysis Plans (SAPs) of ERP. The PM coordinates all field, laboratory, and modeling activities.

2.11 Facility Manager

The Facility Manager is responsible for managing all aspects of the Area in his charge. The Facility Manager must be cognizant of work being conducted in the Area.

2.12 Environmental Hazardous Waste Engineer

The Environmental Hazardous Waste (HW) Engineer oversees, monitors, and advises EG&G Idaho organizations performing field activities at the INEL. Responsibilities include ensuring compliance with DOE Orders, EPA regulations, and other regulations concerning effects of activities on the environment. Additional responsibilities of the HW Engineer include:

- Acting as advisor for environmental concerns associated with ERP task activities
- Maintaining a library of applicable environmental information
- Disseminating applicable environmental information where/when needed.

2.13 Safety Engineer

The SE offers guidance on all safety issues arising at the task site, observes tasks and advises the FTL on required safety equipment necessary to promote a safe work environment, advises FTL and HSO about safety concerns arising during task operations, and recommends solutions to any concerns.

2.14 Quality Engineer

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

2.15 Task Operations Personnel

All task operations personnel, including EG&G and subcontractor personnel, are responsible for understanding and complying with requirements of the task specific H&S Plan. Task operations personnel will be briefed by the FTL before starting each day's activities. They should identify and discuss potentially unsafe task site activities or conditions with the FTL for corrective action. If unsafe conditions develop, task operations personnel are authorized to halt work and notify the FTL of the unsafe condition.

2.16 Oversight Personnel and Visitors

Oversight personnel (i.e., DOE-ID, EPA, and State of Idaho representative) and visitors shall be considered "workers on site only occasionally." To minimize risks that may result from task site activities, "workers on site only occasionally" must have official business and notify the FTL before entering the task site. All "workers on site only occasionally" shall follow the requirements of OSHA 1910.120(d)(3)(ii) which states:

> Workers on site only occasionally for a specific limited task (such as, but not limited to, groundwater monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

If these individuals meet the requirements stated above, they may not proceed beyond the support zone without receiving a safety briefing and wearing the appropriate protective equipment.

3. PERSONNEL TRAINING

Task operations personnel classified by the PM and/or FTL as hazardous material workers shall receive hazardous material worker training as specified by OSHA 29 CFR 1910.120 and the EG&G Idaho Safety Manual, Section 8. Specific training requirements for each hazardous material worker may vary depending on the hazards associated with the job assignment (e.g., noise, radiation). All hazardous material workers must obtain OSHA Hazardous Waste Operator training. Additional training to be considered for hazardous material workers includes but is not limited to:

- Respirator Fit Test Qualification
- Radiation Worker
- Hearing Conservation.

In addition to the above mentioned training, at least one worker with Medic 1st [Cardiopulmonary Resuscitation (CPR) and First Aid] training shall be present at the task site when task operations personnel are present. Managers of hazardous material workers (e.g., PM, FTL) shall obtain Hazardous Waste Worker Supervisor Training. Additional safety training courses may be required as dictated by the job assignment. Section 8 of the EG&G Idaho Safety Manual contains course numbers and descriptions for all EG&G safety training courses.

Employees who attend training classes requiring an annual refresher course must attend the annual courses for as long as they remain active hazardous material workers. Proof of completion of all required training courses by employees and visitors must be provided to the Training and Emergency Action Unit of the Waste Management Operations Support Group. ERP personnel can also obtain information regarding ERP personnel training records

(e.g., due dates of refresher courses) from the Training and Emergency Action Unit of the Waste Management Operations Support Group.

The FTL will ensure that all task operations personnel understand the specific site hazards associated with each task at the daily briefings. Each FTL will also design and ensure implementation of a task specific training orientation to inform task operations personnel about the unique hazards or procedures, task specific H&S Plan, DOPs, etc. associated with the task at hand. Table 3-1 summarizes the above mentioned training requirements.

The following outline shall be used as a guideline for training and orientation before the start of a task. Personnel working at the task site shall be informed of the information listed in this outline, as applicable to the specific task.

A. WORK PLAN (SAP, Test Plan, etc.)

B. HEALTH AND SAFETY ITEMS

1. Personnel responsibilities

2. Medical program

3. Task site work zones

4. Vehicle operation and parking

5. Task site air and radiological monitoring

   a. Monitoring equipment (task site and personal)
   b. Calibration
   c. Maintenance and decontamination procedures

TABLE 3-1. Training topics for ERP hazardous material workers[a]

Training Topic[b]	Personnel Job Description	Task Operations Personnel	Field Managers
OSHA Hazardous Waste Operator	Cleanup or operations of hazardous waste sites	R	R
Respirator Fit Test Qualification	Work area requires use of respirator	R	R
Radiation Worker	Level of radiation exposure determines training category	R	R
Medic 1st	First Aid, CPR	R*	O
Personal Protective Clothing and Equipment	Required to wear Chemical and/or Radiological	R	R
Site Specific Hazards (FTL develops this training)	Encounters task specific potential hazards	R	Develop
Decontamination	Chemical and/or Radiological Procedures	R	R
Hearing Conservation	IH determines exposure to noise above 8-hour time-weighted average of 85 decibels	R	R
Emergency Training	Knowledge of Area drills, rescue, response, information	R	R

R: Required
O: Optional
*: At least one worker with Medic 1st Training shall be at task site when task operations personnel are present.

a. Additional training may be required for each task or individual and should be listed in the addendum.
b. These training topics include both the initial and refresher training (See EG&G Idaho Safety Manual, Section 8 for specific safety training course descriptions and numbers).

B. HEALTH AND SAFETY ITEMS (continued)

6. Potential hazardous contaminants and chemical hazards (toxicity and symptoms) present at the task site

7. Potential radiological contaminants

8. Task Specific Hazard Communication (in addition to the General Hazard Communication) training

   a. Inventory of hazardous agents
   b. Material Safety Data Sheets (MSDSs)
   c. Container labeling
   d. Informing visitors
   e. Contractor inventory and MSDSs

9. Contingency plans and responses

   a. Spill control
   b. Work stoppage

10. Use of field equipment and supplies

   a. Drilling equipment
   b. Work tools
   c. Sampling equipment
   d. Decontamination of equipment and supplies

11. Task site control and security

12. Buddy system and hand signals

B. HEALTH AND SAFETY ITEMS (continued)

13. Work limitations

a. Weather
b. Fatigue
c. Heat stress
d. Cold stress
e. Hours of work
f. Illumination
g. Lightning

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

1. General

2. Availability

3. Level D PPE and clothing, as defined by OSHA, including limitations of protection

a. Work clothing
b. Eye protection
c. Foot protection
d. Head protection
e. Hearing protection

4. Level C PPE and clothing, as defined by OSHA, including limitations of protection

a. Respiratory protection
b. Work clothing
c. Eye protection

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

d. Foot protection
e. Head protection
f. Hearing protection
g. Skin/hand protection

5. Level B PPE and clothing, as defined by OSHA, including limitations of protection

a. Air supplied hood or self-contained breathing apparatus (SCBA)
b. Disposable, chemically resistant coveralls
c. Anti-contamination (anti-c) clothing as recommended by the RE
d. Chemically resistant safety shoes with steel toe
e. Chemically resistant shoe covers
f. Hard hat
g. Inner and outer chemically resistant gloves
h. Hearing protection, as required by IH

6. Level A PPE and clothing, as defined by OSHA, including limitations of protection

a. SCBA
b. Fully encapsulating, chemically resistant suit
c. Additional anti-c clothing, as recommended by the RE
d. Chemically resistant safety shoes with steel toe
e. Chemically resistant shoe covers
f. Hard hat
g. Inner chemically resistant gloves
h. Hearing protection, as required by IH

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

7. Zone I anti-c clothing minimum requirements

   a. One pair cloth anti-c coveralls (or disposable) (as required by HPT)
   b. One yellow cloth hood (or disposable)
   c. Two pair shoe covers
   d. One pair latex gloves and cloth glove liners

8. Zone II anti-c clothing minimum requirements

   a. One pair yellow cloth anti-c coveralls (or disposable)
   b. One yellow cloth hood (or disposable)
   c. Three pairs shoe covers (two pairs must be vinyl)
   d. One pair latex gloves and cloth glove liners

9. Zone III anti-c clothing minimum requirements

   a. One pair yellow cloth anti-c coveralls and head cover (hood)
   b. One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
   c. Three pairs shoe covers (two pairs must be vinyl)
   d. Two pairs gloves and cloth glove liners
   e. Respiratory protection commensurate with the contamination levels

10. Decontamination procedures

   a. Chemical contaminants
   b. Radiological contaminants
   c. Mixed contaminants

D. EMERGENCY ASSISTANCE

1. Availability of emergency services and location of telephone and telephone numbers, MSDSs, and other emergency information

2. Transportation of emergency cases and accompanying medical monitoring procedures

3. Emergency assistance and review of hand and audible signals

E. SPECIAL PRECAUTIONS DURING TASK SPECIFIC OPERATIONS

1. Most dangerous times

2. Most dangerous conditions

3. Specific task checklist.

In addition, the FTL will conduct safety briefings (a) at the beginning of each shift, (b) whenever new personnel arrive at the task site, and (c) as significant changes to task site or work conditions occur.

4. MEDICAL SURVEILLANCE PROGRAM

Employees identified as hazardous waste workers as defined by OSHA (29 CFR 1910.120) require medical surveillance examinations prior to beginning duties, annually, and at the termination of hazardous waste duties (if they have not had such an examination within a year). This includes (a) employees who are or who may be exposed to hazardous substances at or above established permissible exposure limits, without regard to respirator use, for 30 or more days per year; (b) those who wear a respirator for 30 or more days per year; and (c) all HAZMAT employees. In addition, employees who must use a respirator in their job or are required to take training to use a respirator to perform their duties under this plan must be medically evaluated for respirator use at least annually.

The OMP is responsible for evaluating the physical ability of a worker to perform the task assigned. The OMP provides medical clearance to the worker for the work to be performed. The OMP may impose restrictions on the employee by limiting the amount or type of work performed. The PM (or the IH and/or HP with the approval of PM) must provide the job related background information listed below to the OMP for each hazardous material worker. This information must be submitted to the OMP before work begins and annually, one month before birth date of the employee to maintain hazardous waste/hazardous material worker medical clearance. It may be submitted on EG&G Form 3044, "Hazardous Material Worker Job Related Background Information;" EG&G Form 735, "Industrial Hygiene Identification Of An Employee For A Medical Surveillance Program To OMP;" or by other means acceptable to the OMP.

- Medical history and physical examination
  - Preemployment medical examination, for full-time employees
  - Current comprehensive medical examinations, for full-time employees, in an INEL medical facility

- Records and reports from employees' private physicians, as required by the Site Occupational Medical Director

- Medical evaluation by OMP on return to work following an absence in excess of one work week (40 consecutive work hours) resulting from illness or injury

- Medical evaluation in the event a supervisor questions the physical condition of an employee

- Medical evaluation in the event the employee questions his/her physical condition

• Job related background information (Form EG&G-3044)

- What type of job does the individual perform?

- When was the individual first exposed to hazardous substances or working in an environment with potential hazardous exposure at the INEL?

- Relevant environmental monitoring (IH and HPT) data including sample dates and places (if the employee has been exposed to substances or physical agents above an action level)

- How and when was/will the employee (be) trained in PPE including respirators?

- What type of respiratory protective device is to be used?

- How many days per month is respiratory protection to be used?

- How long is this work to continue?

The above information and examinations are used to determine the following for each employee:

- Ability to perform routine occupational tasks
- Work in protective equipment and/or heat stress environments
- Use of respiratory protection
- Need to be entered into additional specific medical surveillance examination programs.

Employees are cleared as hazardous material workers with or without specific restrictions relating to heat stress, certain job tasks, and/or use of respirators. If the OMP does not have sufficient information at the time of request for clearance for respirator training, the supervisor is notified and clearance is withheld until the needed information is provided and any necessary additional examination or testing is completed.

Results of the following tests shall be made available to the OMP when any abnormal exposure is noted or a radiological contamination incident occurs:

- Whole body count (baseline, annual, and on actual or suspected radiological contamination incident)
- Bioassay (baseline, as required to assess internal radiation dose, and on actual or suspected radiological contamination incident).

Subcontractors are responsible for being in compliance with health and safety requirements as stated in 29 CFR 1910.120. All medical data collected pursuant to hazardous material worker qualification of a subcontractor worker shall be made available to the OMP. Background information about the

subcontractor worker will assist the OMP in assessing the medical ability of the subcontractor worker to work should doubt arise during task operations. This information is also required from the subcontractor in order for the OMP to clear the subcontractor worker as a hazardous material worker. Subcontractor past radiation exposure history shall be submitted to the Operational Dosimetry Unit of EG&G Idaho (Section 3.5 of Chapter 2 in the Radiological Controls Manual).

It is the policy of the OMP to examine all workers, including subcontractors, when they are injured on the job or there is reason to believe that they have been exposed, over an action level, to toxic substances or physical agents.

Before initiation of any task where a chemical/radiological hazard exists, the appropriate medical facility will be notified of the start of the task, anticipated schedules, and task site locations by the HSO. In addition, the OMP shall be supplied with an inventory of the known hazardous constituents located at the task sites.

In the event of an IH and/or RE documented exposure to a hazardous substance or physical agent over an action level, the worker(s) shall be transported to the nearest medical facility for evaluation. Further medical evaluation will be in accordance with the symptoms, specific hazard involved, exposure level, medical surveillance requirements, current health and safety directives, and sound medical practices.

The following information shall be provided to the OMP:

- Name, job title, work location, supervisor's name, and supervisor's phone number
- Substances/physical agents (e.g., noise) involved

- Date the employee was first exposed to the substance/physical agent on this task
- Monitoring data including locations of samples and dates samples were taken, if exposed over action level
- PPE in use during this task
- Number of days per month PPE has been in use
- How long this employee will be exposed to the substance or physical agent
- Training the employee has received in the use of PPE
- Type of respirator, if any, being used.

5. HAZARD EVALUATION

Personnel may be exposed to a variety of substances and physical agents while working at the task site. Exposures may be a result of contacting materials stored, handled, or disposed; equipment being used; weather conditions or time of day; environmental surroundings; and/or task specific working conditions. The FTL should asterisk all suspected hazardous materials pertinent to the task on the list provided in the task specific addendum. Any additional stress agents should also be listed in the task specific addendum. A job hazard analysis using EG&G Idaho Company Procedure, Number 11.9 shall be used as appropriate to perform portions of the task site hazard evaluation. All personnel working at a task site should be aware of existing hazards.

The following sections provide general information on the types of potential exposures that may be encountered while working at task sites.

5.1 Chemical Agents

Exposure to chemical agents may result when personnel come in contact with gaseous, liquid, or solid materials encountered at the investigation sites. Personnel shall make every effort to avoid direct contact with disposed or hazardous materials. Task operations personnel may be exposed to contamination through inhalation, ingestion, absorption (skin/eye), and injection (puncture wound).

- Inhalation of hazardous materials can occur due to lack or improper use of respiratory equipment, malfunctioning monitoring equipment, presence of undetected chemicals, or chemicals in quantities greater than the respiratory equipment protection limits.

- Digestive system may be affected by hazardous substances when workers do not practice good personal hygiene habits (e.g., washing hands thoroughly after completion of work and before smoking,

eating, drinking, and chewing gum or tobacco). Inhaling or swallowing airborne hazardous substances may also produce adverse effects to the digestive system.

- Skin absorption of solid, liquid, or gaseous hazardous substances can occur through cuts or abrasions. Skin absorption can occur when a worker does not wear proper protective clothing or when a breach of protective clothing has occurred.

- Eye irritation may develop from solid, liquid, gaseous contaminants. This irritation may occur when a worker does not wear proper eye protection or when unwashed hands come in contact with the eyes.

- Hazardous substances may be injected into the body through puncture wounds occurring from contaminated equipment with sharp edges or protrusions.

5.2 Fire and Explosion

Explosions and fires may occur as a result of activities such as moving drums, accidentally mixing incompatible chemicals, introducing an ignition source into an explosive or flammable environment, or refueling equipment. Intense heat, open flame, smoke inhalation, flying objects, and the release of toxic chemicals into the environment can result.

5.3 Oxygen Deficiency

Oxygen deficiency can result from the displacement of oxygen by another gas or the consumption of oxygen by a chemical reaction. Confined spaces or low-lying areas such as pits or trenches are particularly susceptible to oxygen deficiency. The EG&G Idaho Safety Manual, Section 20 Appendix A and

the EG&G Idaho Company Procedures Manual, Number 11.3, should be reviewed by those working in a confined space.

5.4 Radiological Hazards

The potential exists for radiation exposure and radiological contamination to task operations personnel. Contamination is the presence of uncontained radioactive material on any object or surface or in the atmosphere, especially where the presence of radioactive material may be harmful or could be spread if disturbed by an outside agent.

Types of contamination are discussed below.

- Loose contamination is easily spread to adjacent areas and can be ingested or inhaled.
- Fixed contamination is the presence of uncontained radioactive material on surfaces which cannot be easily removed by normal decontamination techniques.
- Airborne contamination is normally in particulate form and is of concern because it can be ingested or inhaled. When inhaled, airborne particulate can deposit in the lungs and diffuse to other parts of the anatomy causing an internal exposure hazard (respiratory protection must be worn when entering an airborne contamination area.)

Contamination may enter the body through

- Absorption
- Injection
- Ingestion
- Inhalation.

Radiation is energy emitted from a source that travels in electromagnetic waves or very small particles at various speeds or energies. Ionizing radiation is energy emitted from an unstable atom in the form of particles (alpha, beta, neutron) and/or electromagnetic wave or photons (gamma and x-ray) which has enough energy to interact with other atoms and change their charge. Personnel may be irradiated without contamination but cannot be contaminated without being irradiated.

5.5 Biological Hazards

Waste from research facilities, garbage, and animal feces may contain disease-causing organisms. If these agents are present, they could infect task operations personnel and be dispersed in the environment by water and wind. It is recommended (not required) that operations personnel be immunized against tetanus bacteria, which live in the soil, to minimize the effects of possible exposure.

Encounters with wildlife may be possible at the task site. Snakes, insects, and other animals can and will bite if disturbed and avoidance is the best solution. Prompt first aid should be performed if this type of injury occurs.

5.6 Industrial Safety Hazards

Numerous unsafe conditions or actions may be encountered. These may include:

- Existing objects and terrain
- Elevated work areas
- Lifting heavy objects
- Moving machinery and falling objects
- Personal protective equipment

- Task related equipment
- Excavation, trenching, and shoring.

Task operations personnel should look for potential hazards and immediately inform the FTL of those hazards so that action can be taken to minimize injury due to an unsafe condition or action.

5.6.1 Existing Objects or Terrain

Existing objects and terrain can present safety hazards such as:

- Holes and ditches
- Precariously positioned objects (e.g., drums or boards that may fall)
- Sharp objects (e.g., nails, metal shards, and broken glass)
- Slippery surfaces
- Overhead power lines
- Steep grades
- Uneven terrain
- Unstable surfaces (e.g., walls that may collapse or flooring that may give way)
- Ladders/stairs.

Additional safety hazards introduced by the task should be listed in the task specific addendum.

5.6.2 Elevated Work Areas

During the course of task activities, personnel may be required to work on elevated equipment. When such work must be performed, the provisions stated in Section 16 of the EG&G Idaho Safety Manual shall be followed. In addition, personnel required to work under these conditions shall be trained on the use of elevated equipment.

5.6.3 Lifting Heavy Objects

Operations personnel may risk injury by lifting heavy objects. All operations personnel should be trained in the proper method of lifting heavy equipment and cautioned against lifting objects that are too heavy. Mechanical and hydraulic assists will be used whenever possible to minimize lifting dangers.

5.6.4 Moving Machinery and Falling Objects

Task operations personnel may be subject to lacerations and contusions (cuts and bruises) when activity involves contact with moving machinery and falling objects. Injury can be minimized by wearing protective clothing, hard hats, steel-toed boots, and using mechanical assists whenever possible. Loose clothing or neck chains for security badges should not be worn and hair should be secured when personnel work around equipment with moving parts or any other potentially hazardous piece of equipment. All moving and rotating machinery must be properly guarded and guarding must remain in place.

5.6.5 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. Personnel must adjust their work activities to accommodate limitations.

5.6.6 Task Related Equipment

Hazardous equipment and/or situations not mentioned above shall be listed in the task specific addendum. The FTL shall make all personnel aware of possible dangers associated with use of hazardous equipment and/or situations.

5.6.7 Excavation, Trenching, and Shoring

Work at hazardous waste sites may involve excavations for purposes of positioning equipment, removal of contaminated soils, removal of underground tanks, or retrieval of containers such as drums, piping systems, or other buried materials. Tasks which involve work in any excavation present serious potential hazards to personnel; personnel protective systems, barricades, signs, and daily inspections are some of the safeguards required for excavation work. For more detail, see the OSHA requirements outlined in 29 CFR 1926, Subpart P - Excavations. In addition, EG&G Idaho Safety Manual Section 20.0, Appendix B, contains additional requirements which may be more restrictive than those of the OSHA standard.

5.7 Electrical Hazards

Overhead power lines, downed electrical wires, and buried cables all pose the danger of shock or electrocution of workers. Electrical equipment may also pose a hazard to workers. Careful observation for overhead electrical hazards will be performed by operating personnel before raising masts on drill rigs or using cranes. Underground utility clearances must be obtained before drilling or excavating operations by contacting Telecommunications (526-1591/526-2512). The EG&G Idaho Safety Manual, Supplement 2.2 "Safe Work Permits (SWPs)/Special Safe Work Permits (SSWPs)," and Section 10, "Electrical Safety," shall be followed for all work performed near overhead electric lines and electrical work.

5.8 Heat Stress

Workers may be required to wear protective clothing that could prevent the body from cooling naturally, thus causing a rise in body temperature. High body temperatures can result in heat fatigue, physical discomfort, and death. The IH must inform the FTL of signs and symptoms of heat stress to preserve safe work conditions at the task site. Work scheduled for summer

months is subject to higher ambient temperatures than in winter. Radiant heat can create a hazard in the summer. EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of heat stress.

5.9 Cold Exposure

Exposure to low temperatures may be a factor if work is done in the evening hours, if winds are high, if unpredictable weather moves in, and in the winter months (e.g., at 50°F, with a 25 mph wind, the equivalent chill temperature is 32°F). EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of cold stress.

5.10 Noise

Task operations personnel may be exposed to high levels of noise generated by heavy equipment and other sources.

5.11 Decontamination

The chemical and radiological decontamination processes for tools, equipment, clothing, and personnel to remove contaminant generated by the task site activities have the potential for spreading contamination and increasing the exposure to personnel if care is not exercised when decontamination activities are taking place. High pressure hot water and steam used in the process can present a hazard if blasts of either agent rebound into the face or onto the body. In addition, airborne contaminants may result from this process. Decontamination procedures shall be followed and appropriate personal protection shall be used during decontamination activities. Good housekeeping measures will be followed, so that decontamination liquids do not present a hazard.

5.12 Work Stress

Hazardous activities that rely on a high degree of personal alertness shall be performed under controlled conditions of job performance as outlined in Section 20 of the EG&G Idaho Safety Manual. The FTL assumes responsibility of good judgment in the assignment of personnel fatigued by excessive hours of work in psychologically and possibly physiologically stressful environments.

6. LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

Selection of PPE is based on the recommendations contained in NIOSH, 10/85. Each work location will be evaluated for potentially hazardous contaminants by the SE, IH, and HPT before entry. Due to the types of known contaminants and the likelihood of unknown contaminants being present, several recommended levels of PPE are described in this section. The levels are Level A, Level B, Level C, and Level D. Radiological control levels include Zone I, Zone II, and Zone III. The required level for PPE will depend on the IH and RE task site hazard assessment, physical conditions, and monitoring data. The level of PPE used at the task site shall be specified by the IH and RE. Changes in PPE level shall be documented in the FTL logbook.

Without compromising the protection from chemical and radiological exposure, and considering the comfort of the workers, Level B and Level C clothing may be modified as stated in Chapter 8 of the referenced NIOSH, 10/85. That decision will be made by the IH and HPT and documented by the FTL in the task specific addendum.

6.1 Respiratory Protection

All personnel shall wear only those respirators for which they have been trained and acceptably fit-tested. Respirators shall be used under the recommendation of the IH and HPT. Also, guidelines for respirator use, emergency use, storage, cleaning, and maintenance, as stated in EG&G Idaho Company Procedures Manual, Number 11.1, shall be followed.

Inspection procedure performed before respirators are used:

- Check to ensure that bag containing respirator is intact and that expiration date stamped on bag has not expired.
- Check to make sure respirator is clean.

- Look for breaks or tears in the headband material. Stretch the bands to ensure sufficient elasticity.
- Ensure that all headbands, fasteners, and adjusters are in place and not bent.
- Check the facepiece for dirt, cracks, tears, or holes. Ensure that the rubber is flexible, not stiff.
- Check the shape of the facepiece for possible distortion that may occur if the respirator is not properly stored.
- Check the exhalation valve located near the chin between the cartridge holders by:

  - Unsnapping the cover,
  - Lifting the flexible rubber valve and the valve seat to check for cracks, tears, dirt, and distortion, and,
  - After replacing the cover, ensuring that it spins freely.

- Check both inhalation valves located under the respirator cartridges for the same items listed above.
- Check the cartridge holders to ensure that they are clean, necessary gaskets are in place, threads are not worn, and there are no cracks or other visible signs of damage and ensure that they are the correct type of cartridge required for the job.
- Check cartridges (especially the threaded portions) for dents or other damage.

6.2 Level D Personal Protective Equipment

Personnel working inside the task site and wearing Level D PPE shall wear, as appropriate:

- Safety glasses (see Section 16 of EG&G Idaho Safety Manual)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual

- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.3 Level C Personal Protective Equipment

Personnel working inside the task site and wearing Level C PPE shall wear, as appropriate:

- Full-face or half-face air-purifying respirator (with appropriate filters and eye protection) as required by INEL Health Physics and the IH.

NOTE: The use of half-face respirators is not permitted in a radiological environment without authorization of the program/facility manager in consultation with a radiological engineer per EG&G Idaho Company Procedures Manual, Number 11.1.

- Disposable chemical-resistant coveralls
- Anti-c clothing as recommended by RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7
- Eye protection as required by SE (see Section 16 of the EG&G Idaho Safety Manual)
- Emergency egress respirator.

6.4 Level B Personal Protective Equipment

Level B is the same as Level C except the respiratory protection is upgraded to air supplied hood or SCBA. Personnel working inside the task site with designated Level B PPEs shall wear, as appropriate:

- Air supplied hood or SCBA
- Emergency egress respirator
- Disposable chemically resistant coveralls
- Anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.5 Level A Personal Protective Equipment

In rare circumstances, it may be necessary for operating personnel to wear Level A PPE. Level A has the same maximum respiratory protection as Level B; however, the highest available skin and eye protection are required for Level A. All personnel required to wear Level A PPE should include, as appropriate:

- SCBA
- Escape SCBA
- Fully encapsulating, chemically resistant suit
- Additional anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)

- Safety shoes as described by Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers (if applicable)
- Hard hat (if applicable)
- Inner chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.6 Personnel Protection in Radioactively Contaminated Areas

Anti-c clothing shall be worn in contamination control zones. Personal clothing other than underwear and shoes shall not be worn in Zones II and III. Health Physics personnel (HPT and RE) shall define the anti-c requirements for working in areas on the basis of contamination levels determined by surveys and the guidelines below. For entry into Zones II and III, all openings between the coveralls and shoe covers, gloves, and hood shall be taped. Anti-c clothing shall be donned only at or near the contamination control point of the area to be entered. Guidelines for personnel protection in radioactively contaminated areas are contained in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.5.1. The minimum anti-c personal protection for each contamination zone is presented below.

6.6.1 Zone I - Low Level Contamination

The minimum requirements for Zone I anti-c personal protection include:

- One pair of cloth anti-c coveralls (or disposable)
  Note: This requirement may be deleted by the HPT for walk-through entries or health physics surveys.
- One pair of shoe covers
- One pair of latex gloves.

6.6.2 Zone II - Moderate Level Contamination

The minimum requirements for Zone II anti-c personal protection include:

- One pair yellow cloth anti-c coveralls (or disposable)
- One yellow cloth hood (or disposable)
- Three pairs of shoe covers (two pairs must be vinyl)
- One pair latex gloves.

6.6.3 Zone III - High Level Contamination

The minimum requirements for Zone III anti-c personal protection include:

- One pair yellow cloth anti-c coveralls and hood
- One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
- Three pairs of shoe covers (two pairs must be vinyl)
- Two pairs of latex gloves
- Respiratory protection commensurate with contamination levels.

7. SAFE WORK PRACTICES

An SWP or SSWP may be required for a task as described in Section 2.4 of the EG&G Idaho Safety Manual. That section along with Supplement 2.2 describe the types of work that require an SWP or SSWP.

Several factors may affect the safe working environment in the field (e.g., inclement weather, confined work space, extended working schedules, work in heavy PPE, temperature, and work done under artificial illumination). These factors can compromise the work performance of task operations personnel. The FTL is responsible for communicating with task operations personnel to ensure safe and efficient work conditions.

7.1 Working in Confined Spaces

If work is to be performed in a confined space, the FTL will ensure the area is safe for entry, work, and egress in accordance with EG&G Idaho Company Procedures Manual, Number 11.3. If appropriate, specific task site instructions for working in confined spaces shall be presented in the task specific addendum. Task operations personnel shall not enter the confined space until safety personnel and the FTL can ensure it to be safe and the SWP is approved.

7.2 Extended Working Schedules

If work schedules must be extended, Section 20 in the EG&G Idaho Safety Manual offers the guidelines and managerial approval needed for personnel working more than a 48-hour week. The FTL is responsible for the safety of task operations personnel; however, when work weeks are in excess of 48 hours, the FTL must realize that physiological and psychological stresses reduce the safety and efficiency of the field operations. Ultimate responsibility for safety of operations belongs to the FTL.

7.3 Working in Heavy PPE

Work performed in heavy PPE creates additional stresses which severely limit the ability of operations personnel to work long shifts. The FTL should be aware of such limitations and adjust schedules accordingly. The IH and HPT will advise the FTL on this issue.

7.4 Working with Artificial Illumination

If hot and/or windy conditions exist during the regular work shift, schedules may be changed to perform operations at night. Artificial illumination, although a necessity, can create an environment of reduced visibility for the workers. Task operations personnel must be alert and cautious as they maneuver around work areas.

7.5 Buddy System

The buddy system is an effective way to ensure each worker is monitored as to his mental and physical well being during the course of a work day. By using the buddy system, task operations personnel can reduce the chance of being ill or injured and not be noticed. This is particularly crucial for workers in the exclusion zone (Section 8.1 of this H&S Plan). The FTL will pair workers to regularly check on one another during the day's activities. Each member of the pair will observe the other for alertness, motor functions, and coherence.

7.6 Handling Drums and Containers

Drums and containers handled during the task shall be addressed in the task specific addendum. Each drum or container shall meet the appropriate DOT, OSHA, and/or EPA regulations for the wastes they contain. The addendum shall address inspection, labeling, handling operations, waste characterization, spill containment, and transportation. EG&G Idaho Company

Procedures Manual, Numbers 8.1, 8.2, and 8.3 address many of the above items. In addition, if the work plan associated with the task addresses the handling and disposing of waste, the work plan shall be referenced in the addendum.

7.7 ALARA Goals

The as low as reasonable achievable (ALARA) policy objective is to reduce personnel and environmental radiation exposures and doses to the lowest levels in keeping with good operating practices. The ALARA program establishes annual radiation dosage goals and management commitments to assist in meeting these goals.

Personnel working at the task site must strive to keep his or her radiation exposure ALARA through the following practices:

- Adhere to all written radiological requirements and verbal guidance
- Be aware of personal radiation exposure history
- Work within ALARA guidelines and make suggestions as needed
- Minimize the production of all radiological waste
- Minimize personal radiation exposure by these basic protection techniques:

    - Time - exposure is minimized as time is minimized
    - Distance - maintain a maximum distance from radiation source
    - Shielding - use any solid material (e.g., lead, steel, concrete) as a shield (Exposure amounts will vary depending on thickness and type of material.)
    - Limits - radiation exposure limits are contained in the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.2

- Adhere to general safe work practices discussed in Section 7.9 of this plan.

7.8 Radioactive Spill Control

Contamination in uncontrolled areas is designated as a "spill"; if a spill is noticed, task operations personnel shall initiate the SWIMS approach:

- Stop the spill
- Warn area personnel and notify Health Physics
- Isolate the area
- Minimize exposure to the spill
- Secure any ventilation paths and Health Physics surveys the extent of the spill.

Radioactive spill response is discussed in greater detail in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.8.2.

7.9 General Safe Work Practices

The following are general safe work practices to be followed on each task (if work practices vary from those described below, the FTL must record changes in the task specific addendum):

- Contact lenses shall not be worn in company designated eye-hazard areas unless they are essential to correct a vision defect not correctable by prescription safety glasses. Additional restrictions apply as per the EG&G Idaho Safety Manual, Section 16, paragraph 3.7.

- Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the probability of hand-to-mouth transfer and ingestion of material are prohibited within the work/radiation zones. Approved eating areas shall be established or are designated at each Area facility.

- Do not perform work where contaminated substances may be present with an open wound. If a wound is received, report to the HPT and/or IH for further direction.

- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid kneeling, leaning, or sitting on equipment or the ground.

- Task operations personnel should watch for dangerous situations (the presence of strong, irritating, and/or nauseating odors, high airborne concentrations of dust, breached drums, etc.). Personnel should report all potentially dangerous situations to the FTL.

- Prevent releases of oil or hazardous materials used in task operations to the extent possible. If spillage occurs, contain it; report it to the facility representative, where applicable; and immediately clean it up in accordance with the Emergency Preparedness Procedures for the Area. Guidelines in Appendix III of the EG&G Idaho Company Procedures Manual, Number 11.6 for spill cleanup may be useful.

- Prevent splashing of contaminated materials during decontamination.

- Keep all potential ignition sources at least 50 ft from an explosive or flammable environment and use non-sparking, explosion-proof equipment.

- Task operations personnel will familiarize themselves with the physical characteristics of the task site including but not limited to:

  - Wind direction
  - Accessibility to fellow workers, equipment, and vehicles

- Communications at and near the task site
- Exclusion zones (areas of known or suspected contamination)
- Site access (both Area and Task)
- Nearest water sources
- Warning devices
- Nearest emergency assistance.

- At all times, a worker in the exclusion zone shall be in line-of-sight contact with his partner.

- Observe your coworker. Look for signs of exhaustion, heat or cold stress, or exposure to harmful vapors. Ask regularly if he/she is okay. Talk to your partner.

- All wastes generated during the task site investigation shall be managed in accordance with the EG&G Idaho Safety Manual, Section 15.

- Adhere to strict personal hygiene practices such as washing face, neck, and hands before eating, drinking, smoking, or using the restroom. Keep hands away from mouth and eyes when working in an exclusion zone or after handling samples or sample containers. A complete shower may be required at the end of a work shift (IH or HPT discretion).

- Proceed directly to a survey station upon leaving a radiological contamination zone. Care should be taken not to touch the face, mouth, and eyes before a survey has been performed.

8. WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY

Based on the expected levels of contamination and work activity anticipated by each task, several work/radiation zones may be established for the task site. If it is determined that specific zones must be established for a particular task, then entry shall be controlled. Unnecessary personnel shall be excluded. Visitors must (a) notify the FTL in advance of the visit, (b) obtain the required training as specified in Section 3 of this H&S Plan, and (c) have business at the task site to obtain access.

Figure 8-1 provides an example of an approved work site and its established work zones as recommended by NIOSH, 10/85. If work zones are deemed necessary by the FTL upon the advice of the HPT, SE, and/or IH, each project's established work zones should be documented in the task specific addendum. Several work zones required for Levels A, B, C, and D work activities are:

- Exclusion zone
- Contamination area
- Contamination reduction corridor
- Contamination reduction zone
- Support area.

Radiological control zones will be established or incorporated into the work zones as required by the RE. Task site areas with radiological contamination in excess of the limits established in Chapter 4 of the EG&G Idaho Radiological Controls Manual shall be posted or labeled as specified in that chapter of the manual.

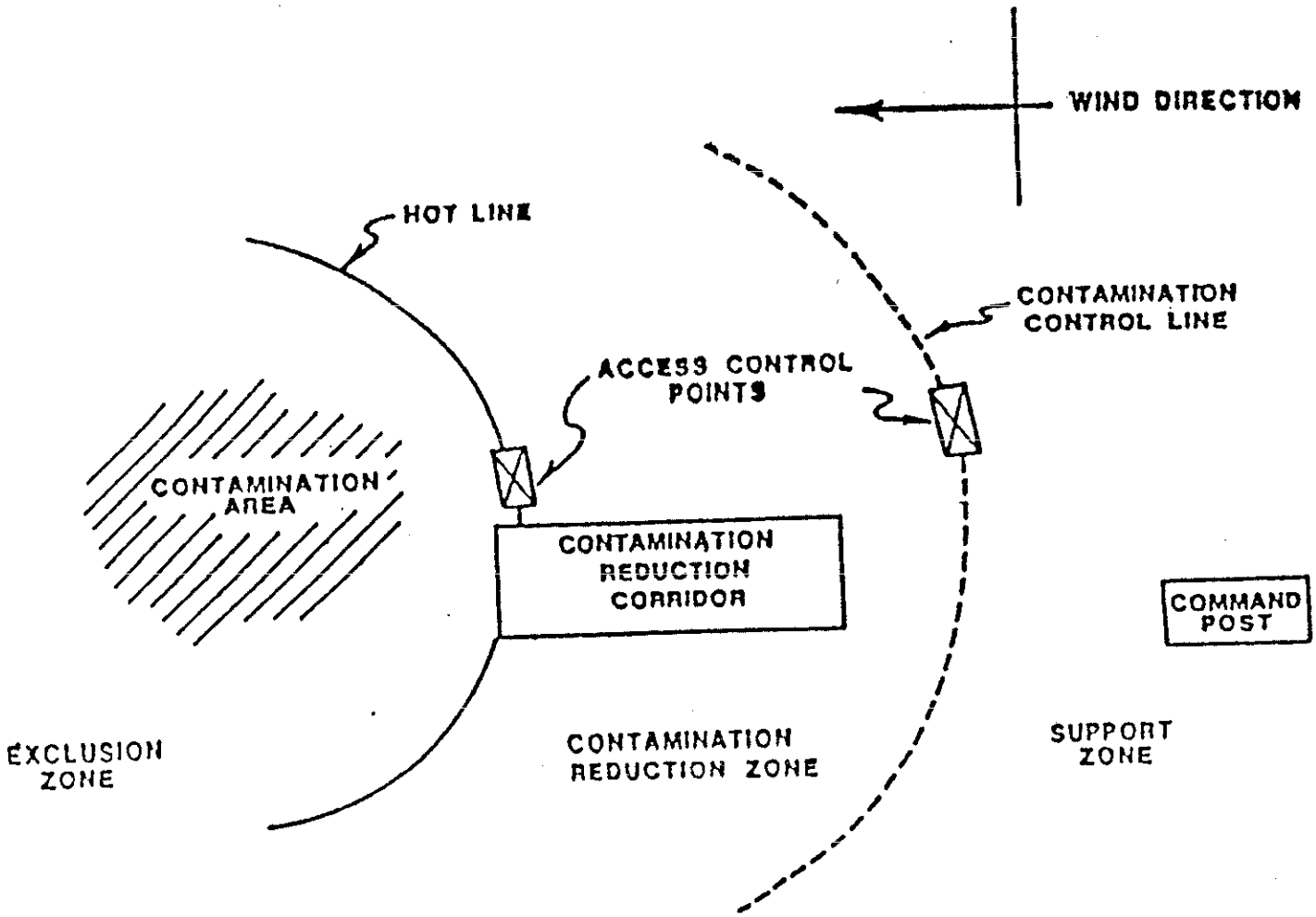

Figure 8-1. Diagram of typical hazardous material task site as recommended by NIOSH, 10/85.

8.1 Work Zones

8.1.1 Exclusion Zone

The exclusion zone includes the immediate work area around the contamination area. The minimum number of personnel required to safely perform the required operations will be allowed into the exclusion zone. The cordon around the exclusion zone is called the "Hot Line."

8.1.2 Contamination Area

The contamination area is the immediate area inside the exclusion zone where investigation activities are taking place. In this area, operations personnel may be subject to the hazards listed in Section 5 of this H&S Plan.

8.1.3 Contamination Reduction Corridor

The contamination reduction corridor is a transition area between the exclusion zone and the support zone. This area will serve as a decontamination area for equipment and a PPE removal area for task operations personnel. In addition, this area may contain emergency response equipment, equipment resupply, and a worker temporary rest area. Due to potential contamination, sample packaging and preparation equipment should not be stored here, but rather, in a contamination free area.

8.1.4 Contamination Reduction Zone

The contamination reduction zone is an area that surrounds the exclusion zone and contamination reduction corridor. This area may consist of several work stations (i.e., sampling, handling, and record keeping) as well as staging areas for equipment. The cordon around the contamination reduction zone is called the "contamination control line."

8.1.5 Support Area

The support area is the area outside the contamination reduction zone. It may contain the equipment trailer, command post, vehicle parking, equipment staging, or any support activity related to the task at hand. All personnel not trained in hazardous material work and visitors are restricted to this area.

8.2 Radiological Control Zones

External radiation control areas and radioactive contamination zones are identified and posted as radiological hazards through the use of barriers and postings. Barriers are used to help confine radiological hazards to a specific area. Yellow and magenta ribbons, ropes, tags, and signs are used to keep unauthorized personnel out of the area. External radiation control areas and radioactive contamination zones shall be posted in accordance with the EG&G Idaho Company Procedures Manual, Number 10.10 and the EG&G Radiological Controls Manual, Chapters 2 and 4. Task specific radiation control areas and contamination zones shall be determined by the RE and HPT and documented in the addendum.

8.2.1 External Radiation Exposure Control

External exposure control is accomplished by identifying areas containing sources of radiation and controlling personnel access into these areas. Section 2 of the EG&G Idaho Radiological Controls Manual discusses external radiation exposure control requirements. These areas shall be posted in accordance with the provisions stated above.

External exposure control is achieved through the following:

a. Controlled Area - Any area where radioactive materials or elevated radiation fields may be present shall be clearly and conspicuously posted as a controlled area.

b. Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent greater than 5 mrem but less that 100 mrem in 1 hr at 30 cm from the radiation source.

c. High Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent of 100 mrem or greater but less than 5 rem in 1 hr at 30 cm from the radiation source.

d. Very High Radiation Area - Any area within a controlled area where an individual can receive a dose of 5 rem or greater in 1 hr at 30 cm from the radiation source. Access to these areas shall be maintained, locked, or physically guarded.

8.2.2 Radioactive Contamination Control

Radioactive contamination controls limit the amount of radioactive surface contamination which individuals are exposed to minimize possible inhalation, ingestion, or absorption of radioactive material; to minimize the potential for release of radioactivity to the environment; and to prevent external contamination of personnel. Contamination limits are set primarily to define "detectability" or the lower limit of detection under ideal conditions. The fundamental philosophy is that no "detectable" contamination will be released to uncontrolled areas. The limits are not based on hazards to personnel but to maintain a high degree of control, restricting radioactive contaminants by engineered barriers. Chapter 4 of the EG&G Idaho Radiological Controls Manual discusses radioactive contamination control in more detail.

Contamination is classified as Zone I, II, or III based on contamination levels as follows:

- Zone I Limits of Contamination
  - 200 to 5000 dpm/100 cm^2 beta-gamma
    20 to 50 dpm/100 cm^2 alpha
- Zone II Limits of Contamination
  - >5000 to 20,000 dpm/100 cm^2 beta-gamma
    >50 to 250 dpm/100 cm^2 alpha
- Zone III Limits of Contamination
  - >20,000 dpm/100 cm^2 beta-gamma
    >250 dpm/100 cm^2 alpha.

9. ENVIRONMENTAL AND PERSONNEL MONITORING

Employee exposure to contaminants and physical hazards will be monitored during all task site activities using an appropriate combination of techniques. The FTL in conjunction with the appropriate personnel (e.g., IH, HSO, RE, SE, and HPT) for each task shall list any monitoring equipment requirements for specific potential hazards in the task specific addendum. An example of items that may be monitored is:

1. Organic vapor using an organic vapor monitor

2. Combustible gas using a combustible gas indicator

3. Heat or cold stress using field measurements and observations and, if necessary, body temperature measurements

4. Radiation and contamination surveys using radiological monitoring equipment

5. Personal exposure to organic vapors, particulate contamination (heavy metals) using personal monitoring pumps and appropriate filter collection media (active sampling)

6. Personal exposure to radiation using thermoluminesent dosimeters (TLDs) and direct reading dosimeters (DRDs)

7. Mercury vapors using a mercury vapor detector

8. Noise levels using a sound level meter and/or noise dosimeter

9. Loose radiological contamination using smears or large area wipes.

9.1 Chemical Exposure Monitoring

Selective monitoring of high-risk task operations personnel at the chest or face level for organic vapors may be recommended by the IH. The monitoring devices used, frequency of monitoring, designated high-risk jobs to be monitored, and action levels for hazardous contaminants shall be discussed in the task specific addendum.

Equipment for monitoring organic vapors at the task site shall be identified by the IH. The equipment, monitoring schedule, and calibration methods shall be discussed in the task specific addendum. The monitoring activities shall be initially based on the job hazard analysis results.

9.2 Combustible Gas Monitoring

If deemed necessary by the SE, the task site will be monitored for combustible gases at time intervals recommended by the SE. Elevated readings from the organic vapor detector might indicate the presence of combustible gases. The SE and IH will advise the FTL on circumstances when work at the task site will be suspended and the course of corrective action, and ensure the task site is safe before work continues. Action levels for combustible gases shall be documented in the task specific addendum.

9.3 Radiological Monitoring

The RE and HPT will be responsible for radiological monitoring in accordance with the EG&G Idaho Radiological Controls Manual, Chapters 2 and 4; and Section 10 of the EG&G Idaho Company Procedures Manual.

9.3.1 External Radiation Exposure Control

Personnel exposures are monitored by TLDs and DRDs. Personnel are responsible for properly wearing the specified dosimetry while in

radiologically controlled areas. If the TLD (or other dosimetry) is lost, task operations personnel shall immediately notify the FTL and HPT. TLDs are supplied and processed by the Operational Dosimetry Unit.

Radiation surveys shall be performed by the HPT to determine the extent and magnitude of radiation levels and to enable posting of radiation areas. Surveys shall be performed in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.8.

9.3.2 Radioactive Contamination Control

All surfaces or areas with contamination levels in excess of those levels stated in Section 8.2 of this plan shall be monitored and controlled to prevent the spread of contamination. Contamination surveys shall be performed by the HPT in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.3.

All personnel shall obtain a whole body survey after exiting a contamination zone; the whole body survey must be done for two to three minutes. The following portable instruments are most commonly used to detect personnel contamination: (a) Ludlum 2a, (b) Eberline RM-14, and (c) Ludlum 177 with pancake probe (frisker), for beta-gamma contamination; and (d) Ludlum Model 61 and (e) Eberline Pac-4s, for alpha contamination. In addition to portable field instruments, the following personnel contamination monitors may be used: (a) large area detectors, (b) portal monitors, (c) personnel contamination monitors, and (d) hand and foot monitors.

9.4 Heat and Cold Stress Control and Monitoring

The FTL will set work/rest schedules as recommended by the IH. Depending upon the ambient weather conditions or work conditions and physical response of task operations personnel, the IH will suggest adjustments of the work/rest cycle to the FTL. The FTL, HSO, and/or IH will ensure that

operations personnel follow established work and break schedules, adequately replace body fluids, and keep body temperatures in a normal range in accordance with the EG&G Idaho Company Procedures Manual, Number 11.10.

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

Task operations personnel shall be aware of the following signs and symptoms of heat stress:

- CONFUSION
- FAINTING
- SLURRED SPEECH
- Clammy skin
- Dizziness
- Fatigue
- Nausea
- Profuse sweating
- Skin color change
- Vision problems.

Task operations personnel who exhibit any of these symptoms will be immediately removed from the task site. An individual who shows any of the symptoms that are capitalized and underlined, or any other evidence of change in level of consciousness, will be transported to an OMP facility for medical evaluation. Mental confusion and decreased level of consciousness must always be considered an emergency requiring medical evaluation and treatment. Transportation to a medical facility or use of an ambulance should be considered normal procedure in this situation. Individuals showing any of the remaining symptoms listed will be provided cool water and allowed to rest. On any occasion when the FTL, worker experiencing the heat stress symptoms, or IH

believes the heat stress is severe or desires medical evaluation, the employee may be brought to an OMP medical facility.

Rest breaks shall include the following preventive measures:

- Drink adequate liquids
- Rest in a cool, shaded area
- Remove protective clothing to allow evaporative cooling
- Do not perform other work during the break.

If personnel are wearing semipermeable or impermeable PPE, the work/rest schedule may be adjusted and monitoring of individual personnel temperatures may be required by the IH. If ambient temperatures are considered excessive by the IH and/or symptoms outlined above exhibited, workers must be monitored for heat stress and recovery. This includes measuring heart rates and temperatures. Temperatures can be obtained using disposable thermometers. The HSO will ensure that sufficient liquids (electrolyte replacement fluids such as Gatorade) are provided and that they are consumed only in the designated and approved eating/drinking area.

Adequate protective clothing as required by IH should be worn to protect against the cold. Extra care must be exercised while working in this environment. Workers should observe each others facial extremities (ears and nose) for signs of frostbite (whitening of the skin surface). Decreased mental coherence and body movements are signs of hypothermia. Individuals with suspected hypothermia or other significant cold injury (e.g., frostbite) will be taken to an OMP medical facility.

Finally, the FTL or IH will refer a worker to the OMP for medical evaluation whenever there is doubt concerning the medical ability of an employee to continue in the assigned task.

9.5 Noise-Level Monitoring

If high noise levels are encountered by operations personnel at the task site, worker exposure will be assessed by the IH. A hearing conservation program must be developed by the IH when the sound levels exceed an 8-hour time weighted average of 85 dBA. Noise level monitoring, PPE requirements, and audiometric tests shall be outlined in the hearing conservation program for the task or employee. Requirements shall be imposed by the PM based on the advice of the IH and the requirements stated in the EG&G Company Procedures Manual, Number 11.7 and the EG&G Industrial Hygiene Manual, Section 26.

9.6 Physical Hazard Control and Monitoring

The FTL will have the primary responsibility for ensuring the task site is maintained in a safe condition by requiring maintenance of barriers and signs, correction of unsafe conditions, and cleaning of debris and trash. The appropriate personnel (e.g., IH, SE, and HPT) will inspect and recommend changes in work habits to the FTL.

Individuals working on a task have a specific responsibility to use safe work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job.

9.7 Record Keeping Requirements

ERP is required to maintain the following information in the ARDC program file in accordance with 29 CFR 1910.120:

- Copies of the Management Plan for the Environmental Restoration Program, Task Specific H&S Plan, QPP, QAPjP, and work plan.

In addition, ERP shall track the following information for each ERP hazardous material worker through the Training and Emergency Action Unit of the Waste Management Operations Support Group:

- Proof of training in health and safety hazard recognition, radiation worker training, respirator training, and any other training specific to the employee
- Required training and updates
- Copy of the signed Health and Safety Certification Form.

The IH is required to maintain a logbook of air monitoring data, personal sampling data, times of sampling intervals, calibration of instruments, and identity of personnel wearing the monitoring equipment. Instrumentation detection ranges and uncertainties should also be recorded in the IH logbook. The HPT is required to keep a logbook of all radiological monitoring, daily operational activities, and instrument calibrations. All project records and logbooks, except HPT logbooks, shall be forwarded to ARDC within 30 days after completion of the task.

10. DECONTAMINATION PROCEDURES

Decontamination procedures for personnel and equipment are necessary to control contamination and to protect operations personnel. Both chemical and radiological decontamination are discussed in this section. However, combined chemical and radiation decontamination procedures are not discussed here and must be developed by the IH and RE if required for a specific task. Decontamination procedures shall be presented in the task specific addendum. These procedures can be amended upon recommendations by the IH, RE and/or HPT. When chemically hazardous material decontamination or radiological decontamination is required, the following procedures are suggested.

10.1 Modified Level A and B Decontamination Procedures

If Level A or B PPE is required, then two decontamination stations will be used at the task site--one at the hotline between the exclusion zone and the contamination reduction corridor and one at the contamination control line, which is the personnel access point to the support zone from the contamination reduction corridor. Decontamination Station A supports personnel and equipment exiting the exclusion zone. Figure 10-1 lists the recommended decontamination procedures. Steps 1 through 8 shall be completed at Station A. Coveralls shall be removed at Station B.

10.2 Modified Level C Decontamination Procedures

Decontamination Station B should be located at the personnel access to the contamination reduction corridor. It is to be used by personnel working in the contamination reduction corridor. Figure 10-2 lists the modified Level C decontamination procedures. If Tyveks are worn (if recommended by the IH), they are decontaminated and removed at Station A.

1.	Remove equipment	EXCLUSION ZONE
2.	Wash and rinse boot covers and gloves	
3.	Remove tape	
4.	Remove boot covers, outer gloves, and hood	
5.	Disconnect air hose and tape end	
		HOT LINE (STATION A)
6.	Wash and rinse suit and boots	
7.	Remove suit	CONTAMINATION REDUCTION CORRIDOR
8.	Wash, rinse, and remove inner gloves	
9.	Remove coveralls	
		CONTAMINATION CONTROL LINE (STATION B)
10.	Field wash/shower	
11.	Put on personal clothing	SUPPORT ZONE

Figure 10-1. Recommended modified Level A and B PPE hazardous chemical decontamination steps.

1.	Remove equipment	CONTAMINATION REDUCTION CORRIDOR
2.	Wash and rinse boot covers and gloves (if worn)	
3.	Remove tape	
4.	Remove boot covers and outer gloves	
5.	Wash, rinse, and remove boots and suit (if worn)	
6.	Remove and drop respirator	
7.	Wash, rinse, and remove inner gloves	
8.	Remove coveralls	
9.	Field wash/shower	CONTAMINATION CONTROL LINE (STATION B)
10.	Put on personal clothing	SUPPORT ZONE

Figure 10-2. Recommended modified Level C PPE hazardous chemical decontamination steps.

At the end of the work day, a full-body shower may be required by the IH or HPT.

10.3 Radiological Decontamination

Radiological decontamination shall be done under the direct supervision of Health Physics (RE and/or HPT) and in accordance with the EG&G Idaho Company Procedures Manual, Number 10.4. Figures 10-3, 10-4, and 10-5 provide the anti-c removal steps for the three contamination control zone designations. Any personnel and personal property contamination may be removed with tape, vacuuming (vacuum must be equipped with a high efficiency particulate air filter), washing with soap and water, or by mechanical means (grinding, etc.).

10.4 Equipment Decontamination and Disposal of Contaminated Materials

Decontamination procedures for equipment shall be recorded or referenced in the task specific addendum. All waste generated by performing decontamination must be disposed in accordance with Section 15 of the EG&G Safety Manual for hazardous nonradioactive waste and radioactive mixed waste. Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Disposable clothing, tools, buckets, brushes, and other contaminated equipment shall be secured and disposed as stated in the task specific addendum. Unused contaminated equipment that can be used at a later time shall be placed in plastic bags and stored at the task site. Decontamination of monitoring equipment should also be addressed.

Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Decontamination operations for equipment and areas shall be performed in accordance with approved procedures.

Zone I Removal Barrier

1. Remove outer shoe covers
2. Remove gloves
3. Remove coveralls
4. Remove shoe covers (during the process of stepping through barrier)

EGRESS POINT

5. Remove cloth glove liners

Figure 10-3. Anti-c removal steps for radiological control Zone I.

Zone II Removal Steps

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT

4. Remove cloth glove liners

Figure 10-4. Anti-c removal steps for radiological control Zone II.

Zone III Removal Barrier

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove disposable hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT A

4. Pull inner hood back and remove respirator
5. Remove inner latex gloves
6. Remove cloth hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT B

7. Remove cloth glove liners

Figure 10-5. Anti-c removal steps for radiological control Zone III.

10.5 Decontamination During Medical Emergencies

If a person is injured or becomes ill and lifesaving care is required, the situation will be evaluated by the appropriate personnel (e.g., first aid personnel) on a case-by-case basis. Emergency care will be initiated in accordance with the emergency preparedness procedure for the facility at which the task is being performed. Medical care necessary to save life or limb is not delayed for decontamination. In such cases decontamination may be performed at the medical facility. The IH and/or HPT will accompany the employee to the medical facility and relay information requested by medical personnel.

11. EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION

Work at hazardous waste sites makes emergencies a continuous possibility, no matter how infrequently emergencies may occur. Emergencies happen quickly, unexpectedly, and require immediate response. The reporting requirements of Section 3 of the EG&G Idaho Safety Manual shall be followed by personnel at the task site. Locations and telephone numbers of emergency personnel and facilities will be posted at places specified in the task specific addendum. The appropriate emergency facilities will be notified by telephone at the beginning of the task to inform personnel at the facilities that work has begun at the task site. The following sections describe the procedures used during emergency situations; equipment that will be available for emergency situations; and agencies, facilities, and personnel who must be notified in case of emergency.

11.1 Emergency Procedures

The following procedures will be used if an emergency arises:

- FTL will be notified of accidents or conditions that have the potential for adversely affecting or threatening personnel safety, property, or environment. The FTL is responsible for ensuring that the EG&G Idaho Safety Manual and the emergency action procedure for the facility are followed in the event of an accident or unusual condition.

- All safety related occurrences will be recorded in a field logbook and reported as indicated in Section 3 of the EG&G Idaho Safety Manual.

11.1.1 Personnel Occupational Injury or Illness in the Exclusion Zone

In the event of an occupational injury or illness in the exclusion zone, an assessment of the situation shall be made by the FTL using the advice of appropriate personnel (e.g., IH, SE, personnel trained in first aid). If the situation is deemed reportable as described in Section 3 of the EG&G Idaho Safety Manual, the FTL is responsible for initiating reporting procedures. In addition, task personnel shall act in accordance with the emergency preparedness procedures for the facility at which the task is being performed. In the event that the task site is shut down due to an injury, task operations personnel shall not reenter the exclusion zone until the cause of the injury or illness is identified and corrective action implemented. Decontamination shall be performed in accordance with the above mentioned emergency procedures and with recommendations made by the IH, HPT, and/or first aid personnel.

11.1.2 Personnel Occupational Injury or Illness in the Support Zone

If an occupational injury or illness occurs in the support zone, the same procedures as described in Section 11.1.1 shall be followed. If the FTL determines the cause of the occupational injury or illness and the absence of the injured or ill party does not affect the performance of other personnel, task operations will continue.

11.1.3 Transportation and Followup of Injury

An injured worker transported to a medical facility will be accompanied by at least one worker (preferably the IH and/or HPT) to inform medical personnel of the level of decontamination performed before leaving the task site and provide specific details about the illness or injury.

11.1.4 Fire/Explosion

Before initiating task activities, brush and grass will be cleared from the task site to eliminate the risk of fire. The EG&G Idaho Safety Manual, Section 11 and any applicable facility emergency preparedness procedures shall be reviewed.

In the event of a fire or explosion, all personnel not essential to controlling the situation will be evacuated from the task site, and fire and/or explosive experts will be notified. In addition, Section 11 of the EG&G Idaho Safety Manual and applicable emergency action procedures for the facility at which the task is being performed shall be followed.

11.1.5 Personal Protective Equipment Failure

If any task site worker experiences a failure or alteration of PPE, that person and his workmate shall immediately leave the exclusion zone. The HPT and IH will assess the situation and determine if exposure to hazardous substance or radiological uptake has occurred. Reentry will not be permitted until the equipment has been repaired or replaced.

11.1.6 Other Equipment Failure or Hazardous Material Spill

If task site equipment fails to operate properly, the FTL will be notified and will determine the effect of the failure on continuing operations. If the failure affects the safety of personnel or prevents completion of the tasks described in the SAP or other work plan, operations personnel shall leave the task site until the situation is evaluated and appropriate actions are taken.

If hazardous or potentially hazardous material is spilled, refer to the emergency preparedness procedure for the Area in which the task is being performed and report the spill to Area personnel as directed. Spillage of

petroleum products, decontamination solutions, calibration material, equipment fuels, and other liquids containing hazardous materials must be assessed.

11.1.7 Hand Signals

Hand signals shall be used if an emergency situation arises and communication becomes impossible or unsafe. The following hand signals will be used in an emergency:

- Hand gripping throat - signals that the person is out of air or cannot breathe
- Grip partner's wrist or both hands around waist - means leave area immediately
- Hands on top of head - signals that assistance is needed
- Thumbs up - okay, I am all right, I understand
- Thumbs down - no, I am not all right, I do not understand.

11.1.8 Emergency Escape

In cases of life-threatening emergencies such as fire or explosion, personnel should leave the vicinity using the shortest possible route without regard for decontamination at that time and move upwind of the affected area. When the situation has stabilized, personnel will take necessary steps to decontaminate themselves, equipment, and other affected areas.

11.1.9 Task Operations Shutdown

Task operations may be suspended for several reasons as indicated below. However, the reasons for operations shutdown are directly related to the

degree of hazard each task possesses. Specific reasons for suspending task operations should be listed in the task specific addendum. Examples include excessive vapor/gas concentrations, radiological hazards, uncovering waste, inclement weather, etc.

- If a combustible gas indication >10% of the lower explosive limit (LEL) occurs indicating a buildup of explosive vapors, work shall stop. Evaluation of the situation will be made and a course of action determined by the FTL in conjunction with the IH and/or SE.

- When significant radiological hazards are identified by an HPT at the sampling site.

- When unexpected hazardous material is uncovered or found in soil samples, even when the appearance of such material may not be associated with a rise in detected contamination levels.

- In addition, drilling, sampling, instrumentation, and other weather sensitive activities will stop during consistent high winds (i.e., >25 mph), electrical storms, or other inclement weather that may affect the work.

11.1.10 Task Site Reentry

In all situations, when a task site emergency results in evacuation of the task site, personnel shall not reenter until authorized to do so by the FTL. The FTL will ensure that:

1. The hazards have been reassessed by the HSO, IH, SE, and/or the RE.

2. The conditions resulting in the emergency have been corrected.

3. The task specific H&S Plan, SAP, Operational Safety Requirements/Safety Assessments, Standard Operating Procedures (SOPs), DOPs, and the Facility Emergency Action Plan have been reviewed as appropriate.

4. Site personnel have been briefed on any changes in the ERP task specific H&S Plan.

Reentry into an evacuated zone to monitor or collect air samples requires the more restrictive of Level C PPE or the level used by those individuals who evacuated the task site. The IH may upgrade to Level B or A if deemed necessary.

11.2 Warning Devices

Warning lights and/or audible alarms shall be installed in areas where needed to warn personnel against remaining in or entering a hazardous area. An explanatory sign or tag shall be posted immediately adjacent to a warning device to describe the hazardous condition and indicate the action to be taken. Table 12.1 in Section 12 or the EG&G Idaho Safety Manual lists various audible warning devices, their meanings, and the required personnel action. Specific warning devices for the task shall be listed in the task specific addendum. Warning devices for radiological hazards (e.g., remote air monitors) shall also be listed.

11.3 Emergency Equipment

The following emergency equipment shall be available at the task site during field operations as appropriate. (A complete emergency equipment list shall be provided in the task specific addendum.)

Fire Extinguishers: Because of the potential threat of fire at hazardous waste sites, at least one 20-lb (minimum) ABC fire extinguisher will be

readily available and at hand throughout the task activities. Additional fire extinguishers may be necessary. This should be indicated in the task specific addendum.

SCBA: Two SCBAs will be available for emergencies such as reentering a contaminated zone to retrieve injured personnel.

First Aid Kits: An industrial first aid kit with sufficient supplies for five people shall be kept in the support zone. The OMP will advise on the selection of first aid supplies to be included at each task site. The HSO will be responsible for maintaining the proper level of first aid supplies in the task site first aid kit.

Eye Wash: Portable eyewash fountains with sufficient potable water for flushing will be readily available for the duration of the task. The location of the eyewash will be determined by the IH.

Communications: Emergency telephone numbers shall be included in the task specific addendum and posted for all operations personnel. Emergency communication shall be discussed in the safety training prior to initiation of site investigation activities. A two-way radio or telephone with capability to contact emergency personnel shall be located on each task site.

Personal Hygiene: A sufficient supply of clean water, hand soap, and towels will be provided at the task site.

Radiological Contamination Spill Kit: Depending on the location of the task and recommendation from RE, a spill kit shall be prepared in advance and located in appropriate work areas. These kits shall contain, at a minimum, the following radiological control equipment:

- Plastic Bags

- Absorbent materials (e.g., paper or rags)
- Latex gloves and glove liners
- Plastic shoe covers and/or rubber overshoes
- Smear paper and holders
- Pencils, grease pencils, and paper
- Radiological tags and signs and radiation rope or ribbon
- Yellow plastic sheeting and duct tape.

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HEALTH AND SAFETY PLAN FOR OPERATIONS PERFORMED FOR THE ENVIRONMENTAL RESTORATION PROGRAM TASK: OU 1-03 AND OU 4-10 TRACK 2 INVESTIGATIONS

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HEALTH AND SAFETY PLAN ADDENDUM FOR THE OU 1-03 AND OU 4-10 TRACK 2 INVESTIGATIONS

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Date

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4/14/92
Date

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	As Low As Reasonably Achievable
cab	Counts Above Background
CAU	Compliance Assurance Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
cpm	Counts Per Minute
CPR	Cardiopulmonary Resuscitation
dB(A)	Decibels on the A-weighted scale
dBs	Decibels
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy, Idaho Field Operations
ERD	Environmental Restoration Department
ERP	Environmental Restoration Program
FFA/CO	Federal Facility Agreement/Consent Order
FID	Flame Ionization Detector
FTL	Field Team Leader
HAZMAT	Hazardous Material
HPT	Health Physics Technician
H&S	Health and Safety
HSO	Health and Safety Officer
IAG	Interagency Agreement
IH	Industrial Hygienist

INEL	Idaho National Engineering Laboratory
IT Corp.	International Technology Corporation
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PWTU	Portable Waste Treatment Unit
RE	Radiological Engineer
RI/FS	Remedial Investigation/Feasibility Study
RML	Radiation Measurements Laboratory
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
TAL	Target Analyte List
TAN	Test Area North
TBD	To be determined
TCL	Target Compound List
TLD	Thermoluminescent Dosimeter
TWA	Time Weighted Average
VOC	Volatile Organic Compound
WAG	Waste Area Group
WBGT	Wet Bulb Globe Temperature

WRRTF Water Reactor Research Test Facility

HEALTH AND SAFETY PLAN ADDENDUM FOR THE OU 1-03 AND OU 4-10 TRACK 2 INVESTIGATIONS

Task: Track 2 Site Investigation Studies

Project No. EGG-WM-10154

DOE Operations Office: DOE-ID

Project Manager: T. J. Meyer Phone No.: 5-5928

Other Contact: _____ Phone No.: _____

Date Plan Requested: _____

Purpose of Task: The objective of this work is to adequately characterize the potential extent and type of contamination at three possible environmental release sites under the Track 2 Operable Units 1-03 and 4-10 being managed by the EG&G Idaho, Inc. (EG&G Idaho) Environmental Restoration Department (ERD) Site Remediation Unit. These operable units are listed under the Interagency Agreement (IAG) Action Plan, which is the guiding document for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial actions at the Idaho National Engineering Laboratory (INEL).

Proposed Dates of Work: March 1, 1992 - December 29, 1992

A.1 INTRODUCTION

This document is tiered to the "Health and Safety Plan for Operations Performed for the Environmental Restoration Program" (EG&G Idaho, 1991) which constitutes the generic Health and Safety (H&S) Plan for the Environmental Restoration Program (ERP). This H&S Plan has been prepared as an addendum to the generic H&S Plan to address task-specific health and safety requirements for the OU 1-03 and OU 4-10 sites. The addendum includes additions, omissions, or modifications to the generic H&S Plan to make the information task-specific. The task-specific H&S Plan need not repeat procedures in the generic H&S Plan; however, these procedures shall be referenced in the addendum.

This H&S Plan was written under the Environmental Restoration Department (ERD) of EG&G Idaho. This newly formed department has assumed the responsibilities of the ERP. The ERP designation on documentation is still correct. For this document, ERP may be used when references are being cited.

A.1.1. Scope of Work

The scope of this project is to characterize the extent and type of contamination at three Track 2 sites at the INEL OU 1-03 and OU 4-10. Two of these sites are located at the Test Area North (TAN) Technical Support Facility (TSF) and Water Reactor Research Test Facility (WRRTF), and are known as the TSF Burn Pit (TSF-03) and the WRRTF Burn Pits (WRRTF-01). The third site is located at the Central Facilities Area (CFA), and is identified as the CFA Landfill I (CFA-01). This project will provide the necessary data to allow the IAG Project Managers to decide what further actions need to be taken at these sites. These actions would include no action, interim action, or further evaluation under the comprehensive Remedial Investigation/Feasibility Studies (RI/FS) for Waste Area Group (WAG) 1 at TAN and WAG 4 at CFA. Primary activities will include the following tasks:

Drilling boreholes for deep soil samples. This task will involve drilling boreholes at locations within and surrounding the contaminated areas at each site. Details on the number, location, and drilling requirements for each borehole are contained in the "Track 2 Sampling and Analysis Plan for OU 1-03: TSF-03 and WRRTF-01 Burn Pits" (EG&G Idaho, 1992a), and the "Track 2 Sampling and Analysis Plan for OU 4-10: Central Facilities Area Landfill I" (EG&G Idaho, 1992b). Soil samples will be screened with field instruments for radiation and volatile organic vapors. Soil samples will be collected, as specified in the Sampling and Analysis Plans (SAPs) (EG&G Idaho, 1992a and b), for volatile organic compounds (VOCs), metals, and radionuclides, and analyzed at an off-site laboratory. Drill cuttings will be surveyed with field instruments for radiation and organic vapors (see the

respective SAPs (EG&G Idaho, 1992a and b). If no activity is detected, the cuttings will be placed back into the borehole. Cuttings with measurable levels of activity will be sampled, containerized, and disposed of, depending on laboratory results.

Excavating test pits for landfill soil cover geotechnical characterization samples. This task will involve excavating test pits at locations within and surrounding CFA Landfill I. Details on the number, locations, and excavating requirements for each test pit are contained in the "Sampling and Analysis Plan for OU 4-10: Central Facility Area Landfill I" (EG&G Idaho, 1992b). Passive soil vapor sampling for VOCs will be conducted at each test pit location prior to excavation. Soil samples will be screened with field instruments for radioactivity and for volatile organic vapors. Soil samples will be collected for geotechnical analyses at an off-site laboratory. The test pits will not exceed 4 feet in depth, and no one will enter the test pits; therefore, shoring of the pit walls will not be required. All excavated soil will be returned to the test pits.

A.1.2 Background

A.1.2.1 Task Site Description. The two OU 1-03 Track 2 sites are located at TAN (see Figure A-1). The OU 4-10 Track 2 site is located at CFA (see Figure A-2).

A.1.2.2 Waste Description (type and location). Wastes encountered during this project will be primarily in the form of potentially contaminated soils generated during drilling and sampling activities.

At the TSF-03 and WRRTF-01 burn pits, the primary contaminants expected to be encountered include residual ash material which may contain metals (chromium, lead, and mercury) and volatile organics (e.g., gasoline and diesel components, paints, and solvents). The primary contaminant concentrations are anticipated to range from near background levels to the low parts per billion (ppb) level. At the CFA-01 landfill, primary contaminants that may be present include Target Analyte List (TCL) metals and Target Compound List (TAL) volatile organics. Radionuclides are not expected to be present at levels above background at any of these sites, based on past surveys and process knowledge of activities at these sites.

A.1.2.3 Unusual Features (e.g., containers, buildings, dikes, power lines, terrain). Unusual features are not a problem for this project. All planned work will be performed at least 25 feet away from power lines and buildings. Terrain in the areas is generally level. Some work will be done near dikes and ditches, but adequate space is available to set up protection zones and work areas.

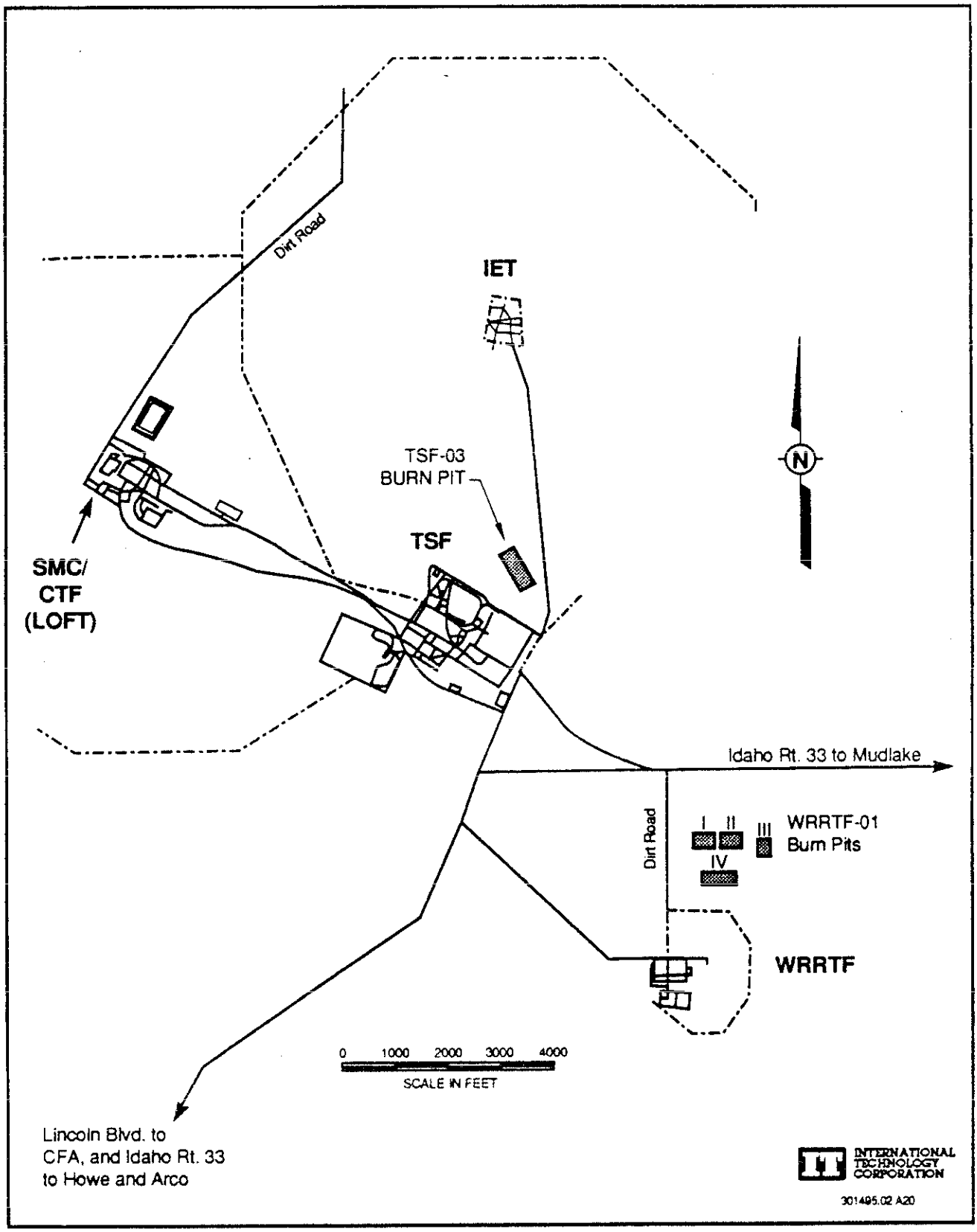

Figure A-1. Location map of the TAN Track 2 sites.

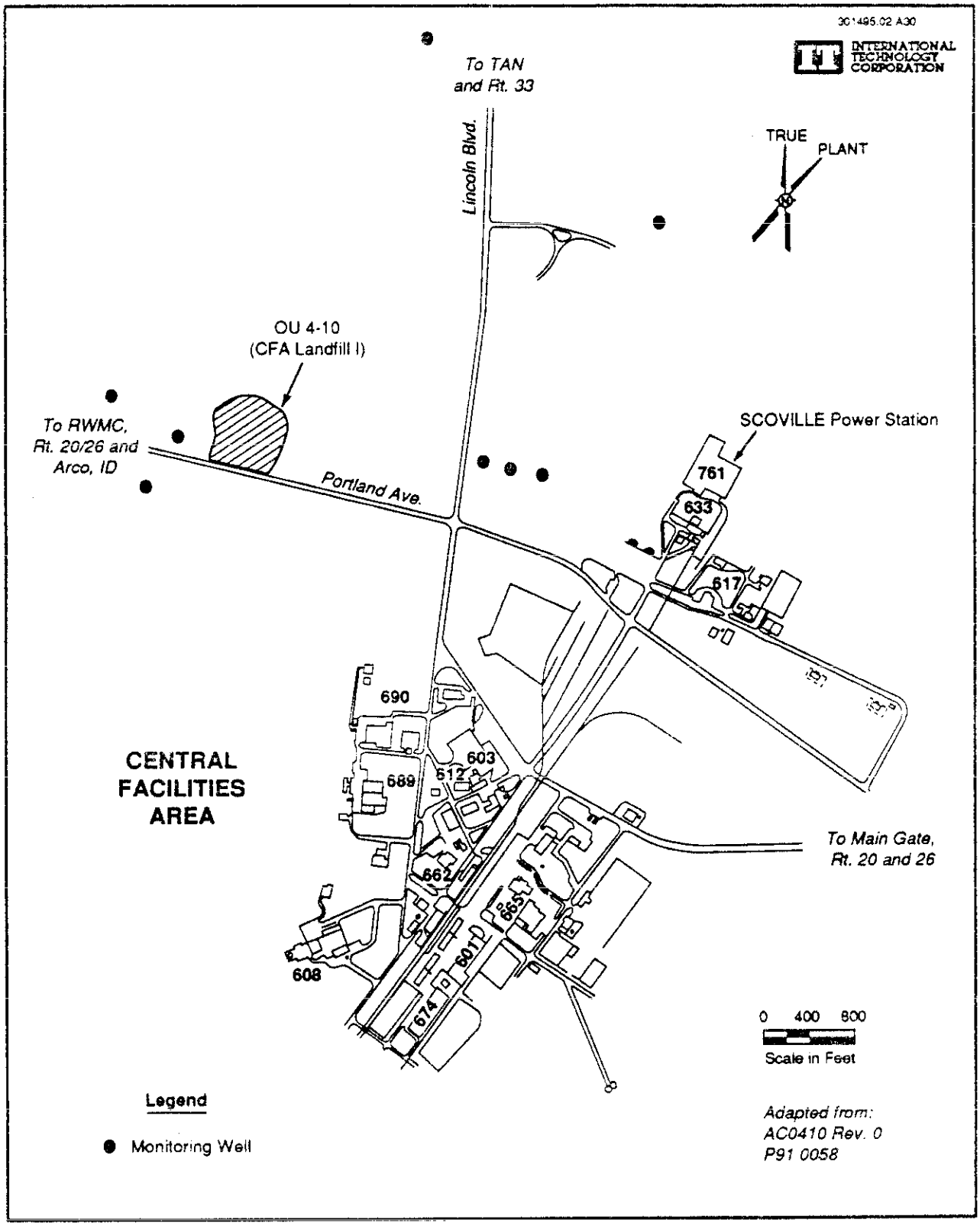

Figure A-2. Location map of the CFA Track 2 site.

A.1.2.4 Status of Task Site (active, inactive, unknown). The TAN and CFA facilities are still active, but normal facility activities will not be impacted by the planned tasks. The TSF-03 and WRRTF-01 burn pits and the CFA-01 landfill are inactive. The planned activities are outside of facility fences. All activities will use exclusion zones to protect facility and project workers.

A.1.2.5 History (worker or nonworker injury, complaints from public, previous agency action). These investigations are in support of the INEL Federal Facility Agreement/Consent Order (FFA/CO) to evaluate the release of contaminants to the environment from these sites. The TSF-03 and the WRRTF-01 burn pits were used from the 1950s to the 1970s to burn combustible solids and liquids from the TAN area. The CFA-01 landfill was operated from the early 1950s to the 1980s. Wastes generated during the construction of the CFA facilities and, later, INEL municipal wastes were disposed of in the CFA Landfill I. Additional information on each site can be found in the Track 2 Scopes of Work provided in Appendices A and B of this H&S Plan, and in the "Track 2 Sampling and Analysis Plan for OU 1-03: TSF-03 and WRRTF-01 Burn Pits" (EG&G Idaho, 1992a) and the "Track 2 Sampling and Analysis Plan for OU 4-10: Central Facilities Area Landfill I" (EG&G Idaho, 1992b).

A.1.2.6 Previous On-site Monitoring; Expected On-Site Hazardous Substances and Materials. Measurements taken by an Industrial Hygienist (IH) using field instruments found no detectable levels of organics in worker breathing zones during previous work at the TAN Track 2 sites. None of the three sites are expected to be radioactively contaminated based on past surveys, and none have received radioactive wastes based on the operating history for these sites. Expected on-site hazardous substances and materials at the TAN and CFA Track 2 sites are listed in Table A-1.

A.2 RESPONSIBILITIES

Table A-2 lists the proposed site investigation team, and Figure A-3 shows the ERD/field organization chart. It is the responsibility of the Health and Safety Officer (HSO) and the Field Team Leader (FTL) to ensure that all requirements stated in the generic H&S Plan (EG&G Idaho, 1991) and this addendum are observed. The on-site IH shall serve as the HSO. This project will comply with all applicable Occupational Safety and Health Administration (OSHA) regulations, American National Standards Institute standards, and the American Conference of Governmental Industrial Hygienists Threshold Limit Values for Exposures to Chemical and Physical Agents as declared in Department of Energy (DOE) 5480.10, "Contractor Industrial Hygiene Program," DOE/ID 5483.1A, "Occupational Safety and Health Standards," and DOE/ID 5480.4, "Environmental Protection, Safety, and Health Protection Standards" (EG&G Idaho *Industrial Hygiene Manual*, Section 3, 1992c). The responsibilities of the FTL and other field team members are presented in detail in Section 2 of the generic H&S Plan.

Table A-1. Expected on-site hazardous substances and materials at the TAN and CFA Track 2 sites.

Hazardous Material Name and CAS No.	Exposure Limit (PEL/TLV/REL)	Routes of Exposure[a]	Symptoms of Overexposure[b]	Target Organs/ Systems	Carcinogen? (source)[c]	Expected Levels
Stoddard solvent[d] 8052-41-3	350 mg/m^3	Inh, Con, Ing	EYES, RESP, CNS, DERM	Skin, eyes, respiratory system, CNS	No	Trace
Paint (naphtha)[d] 8030-30-6	400 mg/m^3	Inh, Ing, Con	CNS, EYES, RESP, DERM, drowsiness	Respiratory system, eyes, skin	--	Trace
Chromium[d] 7440-47-3	0.5 mg/m^3	Con, Ing	DERM	Skin	No	Trace
Lead[d] 7439-92-1	0.05 mg/m^3	Inh, Ing, Con	Weakness, lassitude, insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, wrist/ankle paralysis, encephalopathy, nephropathy, hypotension, EYES	GI tract, CNS, kidneys, blood, gingival tissue	No	Trace
Mercury (vapor)[d] 7439-97-6	0.05 mg/m^3	Inh, Abs, Con	RESP, EYES, DERM, chest pain, tremor, insomnia, irritability, indecision, headache, fatigue, weakness, stomatitis, salivation, GI disturbance, anorexia, weight loss, proteinuria, CNS	Skin, respiratory system, CNS, kidneys, eyes	No	Trace
#2 Diesel[e]	100 ppm	Con, Inh	DERM, RESP, EYES	Skin, respiratory system, eyes	No	NA[f]
Gasoline[e] 8006-61-9	890 mg/m^3	Inh, Abs, Con, Ing	DERM, EYES, RESP, CNS	Respiratory system	No	NA[f]
Methanol[e] 67-56-1	260 mg/m^3	Inh, Abs, Ing, Con	EYES, headache, drowsiness, CNS, vomiting, blindness	Eyes, skin, CNS, GI tract	No	NA[f]
Vermiculite[e]	5 mg/m^3	Inh, Con	RESP, EYES	Respiratory system, eyes	No	NA[f]
Alconox[e]	None listed	Inh, Ing	Irritation of mucous membrances, sneezing	Respiratory system	No	NA[f]

[a] (Inh) Inhalation; (Con) Skin or eye contact; (Ing) Ingestion; (Abs) Skin absorption.

[b] (EYES) Irritation/tearing; visual disturbance; (RESP) Respiratory System: nose/throat irritation; histologic fibrosis of lungs; cough/dyspnea/bronchitis/pneumonitis; (CNS) Central Nervous System: Dizziness/lightheaded/nausea; (DERM) Rashes/itching/redness; sensitization.

[c] If yes, identify agency and appropriate designation (ACGIH A1 or A2; NIOSH; OSHA).

[d] Waste related.

[e] Sampling related.

[f] Not Applicable: these materials will be containerized, controlled, and dispensed in accordance with standard acceptable practices.

Sources: American Conference of Governmental Industrial Hygienists, *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, 1990-1991, Second Printing.
National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, U.S. Department of Health and Human Services, June 1990.
Material Safety Data Sheets (see Appendix C).

Table A-2. Site investigation team.

Personnel	Discipline/Tasks Assigned
T. J. Meyer (EG&G Idaho)	Project Manager
IT Corp. - To be determined (TBD)	Field Team Leader
EG&G Idaho On-site Industrial Hygienist (IH)	Industrial Hygienist/Health Safety Officer
EG&G Idaho-TBD	Health Physics Technician
EG&G Idaho/IT Corp.-TBD	Sampling Team
TBD	Drilling Contractor

Names of specific personnel will be entered into the FTL and IH logbooks and Safe Work Permit at the start of each task. The names of all off-site subcontractors will be supplied to the Compliance Assurance Unit (CAU) Radiological Engineer (RE) to maintain and track ALARA goals.

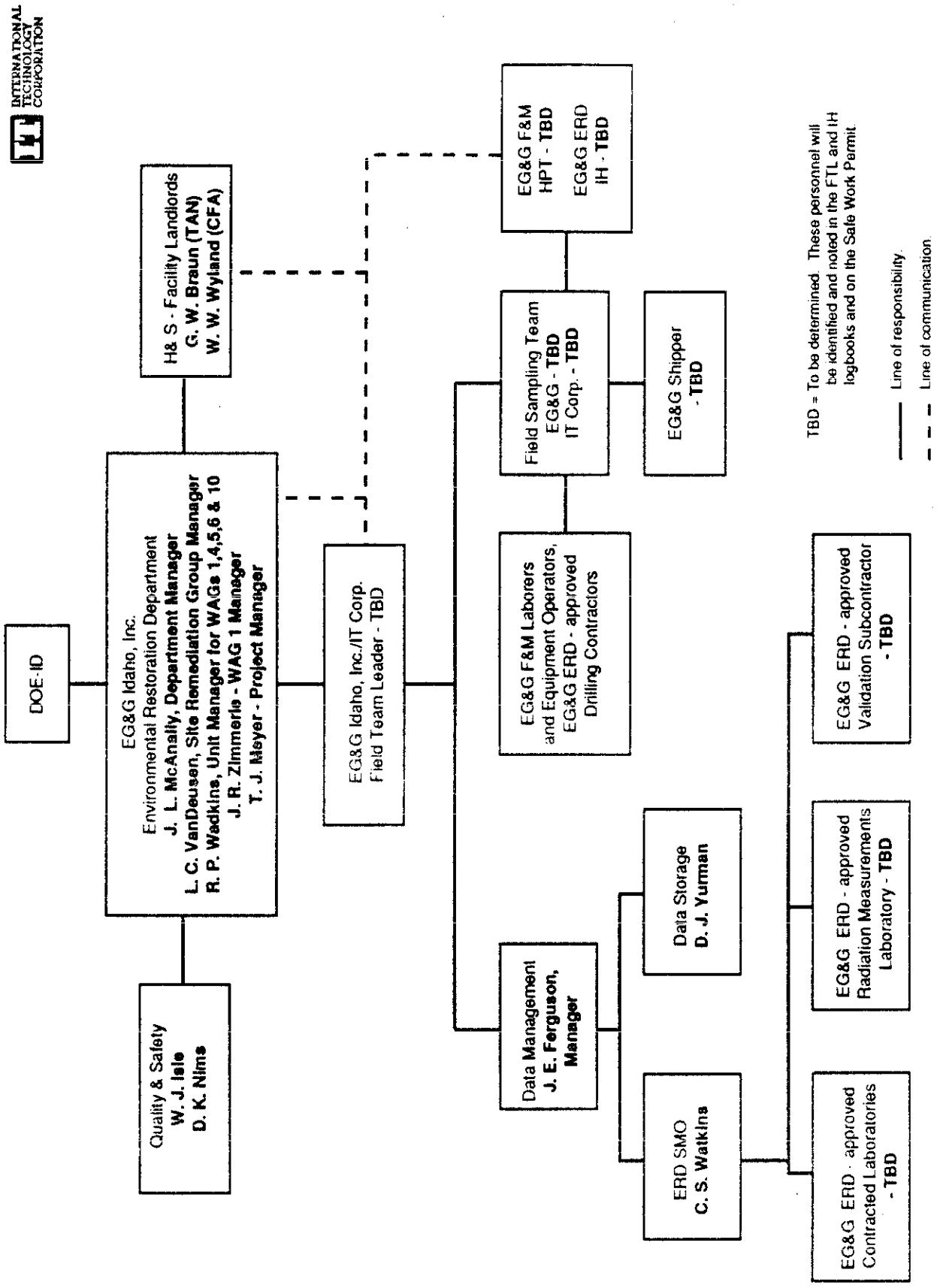

Figure A-3. EG&G Idaho, Inc. Environmental Restoration Department/field organization chart.

A.3 PERSONNEL TRAINING

All field personnel at the OU 1-03 and OU 4-10 sites will be trained in accordance with the Code of Federal Regulations Title 29 (29 CFR) 1910.120 and the EG&G Idaho *Safety Manual*, Section 8, "Safety Certifications, Training, and Meetings" (EG&G Idaho, 1992d). All personnel working on the sampling sites shall have completed 40 hours of instruction in hazardous waste operations health and safety, in addition to three days of actual field experience under the direct supervision of a trained, experienced supervisor per the requirements of 29 CFR 1910.120. Site supervisors shall have at least eight additional hours of specialized training. Additional training requirements for task site personnel are listed in Table A-3.

Proof of completion of all required training courses (including refresher training) must be maintained on the site at all times. Form EG&G-2580, Health and Safety Permit Card, is acceptable proof of training provided all the required training is documented on the card and is current. Certification cards or copies of the certificate(s) issued by instructors or the institution where the training was received are also acceptable proof of training, and may be carried by personnel in lieu of Form EG&G-2580.

Project personnel will receive an initial orientation program outlining the specific operations and hazards associated with these projects, including a review of this H&S Plan, a discussion of the particular hazards at the sampling sites, use of personal protective equipment (PPE), work practices to minimize risk, safe use of project equipment, and use of engineering controls.

The FTL will conduct daily briefings at the start of the shift. The purpose of the briefings is to inform task personnel about new hazards at the site, changes to the health and safety plan, changes in procedures, and a review of PPE associated with the day's activities.

A.4 MEDICAL SURVEILLANCE PROGRAM

The requirements for medical surveillance shall be consistent with Section 4 of the generic H&S Plan (EG&G Idaho, 1991) and Section A.9.2 of this H&S Plan. The names of all off-site subcontractors will be given to the Compliance Assurance Unit (CAU) Radiological Engineer (RE) to maintain and track ALARA goals. All personnel required to wear hearing protection will receive baseline and annual audiograms, as well as training on the causes and prevention of hearing impairment.

Table A-3. Training required for task site personnel.

	Field Sampling Team	Project Manager	Industrial Hygienist/ Health Safety Officer	Health Physics Technician	Drilling Contractor	Field Team Leader	Visitors
OSHA Training[a]	X	X	X	X	X	X	X
Task site orientation[b]	X	X	X	X	X	X	X
Decontamination							
Personnel	X	X	X	X	X	X	X
Equipment	X		X	X		X	
Hazard communication	X	X	X	X	X	X	X
Signs, tags, warning devices	X	X	X	X	X	X	X
Hazardous waste site supervisor		X				X	
Hearing conservation	X	X	X	X	X	X	X
Radiation worker qualification	X	X	X	X	X	X	X
First Aid/CPR response						X[c]	
Respirator fit test qualification	X	X	X	X	X	X	X

a OSHA hazardous waste operations health and safety training, as required by 29 CFR 1910.120, should be current through original or refresher certification and requalification. The Field Team Leader will verify current training prior to the start of each task.

b May include review of Area Emergency Plans.

c At least two persons on site during sampling activities will be trained as First Aid/CPR responders.

A.5 HAZARD EVALUATION

A.5.1 Potential On-site Hazards

Based on available information, potential on-site hazards include exposure to chemical agents, fire and explosion hazards, radiological and biological hazards, noise, and other general industrial safety hazards. The generic H&S Plan (EG&G Idaho, 1991) provides a discussion of the general site hazards such as slip/trip hazards, uneven terrain, handling of heavy objects, and other potential hazards, which will not be readdressed here. The specific hazards associated with the sampling sites and activities are presented below.

A.5.2 Hazards Analysis

Hazard evaluation is addressed in Section 5 of the generic H&S Plan (EG&G Idaho, 1991). A hazard classification, as required by DOE Order 5481.1B and DOE-ID Order 5481.1B, has been prepared for the TSF-03 burn pit, WRRTF-01 burn pits, and the CFA-01 landfill. That report documents a hazard classification for these Track 2 sampling activities (see "Hazards Classification for Sampling the Waste Area Group 1 and 4 Track 2 Interagency Agreement Sites," EG&G Idaho, 1992e).

A.5.2.1 Chemical Agents. Hazards during drilling and sampling consist of the potential inhalation of metal-contaminated dust and volatile organic vapors, and possible skin contact with various contaminants. Personal protective clothing and equipment will be worn to minimize the potential for chemical exposure. The hazard potential of the substances and materials expected to be present at the three sites is listed in Table A-1. Material Safety Data Sheets (MSDSs) for hazardous materials on site are included as Appendix C. All hazardous materials brought on site for equipment decontamination will be stored in properly labeled containers.

A.5.2.2 Fire and Explosion Hazards. As a precaution, the on-site IH will monitor the atmosphere for combustible gases at the boreholes during drilling/sampling activities using a combustible gas indicator. The IH will stop operations if combustible gases exceed 10% of the lower explosive limit (LEL). Since these operations will be outdoors, natural ventilation will help to reduce the potential hazard.

A.5.2.3 Radiological Hazards. Based on previous sampling activities, there are no radiological hazards at these sites. Track 2 activities will be surveyed with field instruments, and if radiation levels exceed 100 counts per minute (cpm) above background beta/gamma, or if any alpha activity is detected, operations will stop until the on-site Health Physics Technician (HPT) evaluates the situation and determines appropriate PPE following the *EG&G Idaho Company Procedures*

Manual (EG&G Idaho, 1992f) and procedures presented in the *Radiological Controls Manual* (EG&G Idaho, 1992g).

A.5.2.4 Biological Hazards. Based on available information, biological hazards may include snakes, spiders, and ticks in the brush and high grasses at the Track 2 sites. Bites may occur if care is not taken to avoid these hazards. Prompt first aid will be administered if this type of injury occurs.

A.5.2.5 Industrial Safety Hazards. Industrial hazards associated with drilling and heavy equipment may be encountered. Task operations personnel may be subject to cuts and bruises when working with this equipment. Injury can be minimized by wearing protective clothing, hard hats, and steel-toed shoes or boots. Loose clothing or neck chains, including security/thermoluminescent dosimeter (TLD) badge neck chains, shall not be worn and long hair shall be secured when working around equipment with moving parts or any other potentially hazardous equipment.

A.5.2.6 Drilling Hazards. Drilling involves a number of hazards including, but not limited to, the following: injuries from flying debris, moving parts, hydraulic failures, unguarded points of operation, noise, airborne particulates, equipment rollover, and other hazards associated with the transportation and use of drill rigs. The supplier of the drill rig shall ensure equipment is well maintained, meets existing safety requirements, and is inspected daily and before releasing the drill rig to new projects. Safe work practices for drilling are presented in Section A.7 of this plan.

A.5.2.7 Electrical Hazards. Based on available information, electrical hazards are the use of portable generators for power field equipment and overhead electrical lines at the CFA Landfill I. Ground-fault circuit interrupters will be used on all outdoor connections. Care will be taken to keep the generator and associated equipment out of and away from any water (if present at the work site). As a precaution, drilling masts will be located at a minimum of 25 feet from all overhead electrical lines, and drilling should not be done any closer than 5 feet from buried electrical or other utilities.

A.5.2.8 Noise Hazards. The main direct sources of noise for this project are produced by the drill rig and portable combustible engines (e.g., generators). The machinery associated with activities can physically damage the ear and hinder communications. Noise levels are expected to exceed 85 dB(A) (decibels on the A-weighted scale). Noise monitoring will be done in accordance with 29 CFR 1910.95 and will be conducted as deemed necessary by the HSO. Personnel working near the drill rig will be required to wear noise-reduction rating equipment of 26 dBs.

A.5.2.9 Heat/Cold Stress. During extreme weather conditions, proper exposure monitoring, clothing, fluid intake, and/or work/rest regiments will be implemented by the on-site IH or the FTL per the EG&G Idaho *Industrial Hygiene Manual*, Section 20 (EG&G Idaho, 1992c). Some of the

tasks in this project will probably be completed when there is a potential for heat stress resulting from the ambient air temperature. The FTL will monitor the temperature and adjust work/rest cycles according to the response of sampling personnel. Any team member who exhibits heat stress symptoms such as dizziness, profuse sweating, skin color change, vision problems, or confusion will be removed immediately from the work area and allowed to rest. If symptoms persist or if the FTL deems necessary, the team member will be taken to the nearest medical facility.

Exposure to low temperatures may also be a factor when work is done in the evening hours, if winds are high, if unpredictable weather moves in, and in the winter months (e.g., at 50°F, with a 25 mph wind, the equivalent chill temperature is 32°F). *EG&G Idaho Company Procedure Manual*, Number 11.10 (EG&G Idaho, 1992f), discusses the hazards of cold stress. The FTL and the on-site IH will monitor workers for symptoms of cold stress such as whitening of the skin, especially at the extremities (nose, ears, fingers, etc.).

A.6 LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

A.6.1 Personal Protection Used on Previous Site Visits

Level D personal protective equipment was worn during previous field activities at the TSF-03 burn pit and at the CFA Landfills II and III, located east and northwest of CFA Landfill I, respectively.

A.6.2 Personal Protective Equipment

Sampling personnel must wear the following modified Level D personal protective equipment unless the on-site IH instructs otherwise:

- Hard hat
- Latex gloves (cloth inner gloves are optional)
- Steel-toed leather boots or shoes
- Suitable work clothing (coveralls or Tyvek if recommended)
- Appropriate eye protection
- Disposable shoe covers.

The non-sampling personnel will wear Level D personal protective equipment, which includes:

- Hard hat
- Leather gloves
- Steel-toed leather boots or shoes

- Long-sleeved coveralls
- Appropriate eye protection.

A.6.2.1 Respiratory and Dermal Requirements - Personal Protective Equipment. Personnel must wear Level D personal protective equipment (PPE) as described above and in Section 6 of the generic H&S Plan (EG&G Idaho, 1991). Any upgrades or downgrades of PPE for work activities will be based on monitoring by the on-site IH. Required PPE in excess of the equipment listed above will be documented on the Safe Work Permit.

A.6.2.2 Selection Criteria. PPE is selected based on the toxicity of and the potential for exposure to the various hazardous agents of concern, and the risks associated with that exposure. Factors that were considered for toxic and hazardous agents include exposure routes, duration and expected levels of exposure, and health hazards associated with exposure to the expected levels. Routes of exposure, expected levels, and health hazards (symptoms of overexposure) associated with the expected on-site hazardous agents of concern are listed in Table A-1. Based on the above, and on the past history, the types and quantities of known contaminants, and the low probability of encountering significant unknown contaminants at these three Track 2 sites, the recommended level of PPE is Level D. The levels of organics in the soils at these sites are expected to be in the parts per billion range (see "Hazards Classification for Sampling the Waste Area Group 1 and 4 Track 2 Interagency Agreement Sites", EG&G Idaho, 1992e). Airborne concentrations of organic vapors are expected to be this low, as well. No detectable radiation levels have been measured at these sites. Therefore, Level D PPE is justified for these activities.

A.6.2.3 Modification for Personal Protection Requirements. If organic vapor readings exceeding the levels listed in Section A.6.3 of this plan are encountered in the breathing zone, work will stop, and site conditions will be evaluated by the site health and safety professionals. The IH may recommend altered work practices or PPE based on this screening information. Higher levels of PPE are discussed in Section 6 of the generic H&S Plan (EG&G Idaho, 1991). Any increased level of PPE will be documented on the Safe Work Permit.

Similarly, the on-site HPT will check radiation levels using the field instruments listed in Section A.9.1 of this plan. If readings exceed those listed in Section A.6.3 of this plan, work will stop, and the HPT will follow requirements in the *Radiological Controls Manual* (EG&G Idaho. 1992g). If field instruments detect beta/gamma activity exceeding 100 counts per minute above background (cab) or any alpha activity in environmental samples to be sent off site for analysis, a sample will be submitted to the Radiation Measurements Laboratory (RML) for confirmation of field screening results. Radiation personal protective equipment and zone levels are given in Sections 6.6 and 8.2.2, respectively, of the generic H&S Plan (EG&G Idaho, 1991).

The atmosphere in the immediate work zone and samples collected during drilling will be monitored using instruments such as photoionization detectors (PIDs), flame ionization detectors (FIDs), and radiation survey meters in order to verify adequacy of PPE. Action levels requiring PPE upgrade are given for sustained organic vapor readings in the parts per million (ppm) range as listed in Section A.6.3. Sustained measurements near or exceeding the levels listed in Section A.6.3 will require continued monitoring with the PIDs and/or FIDs and combustible gas indicator. If elevated levels do not dissipate, work will be stopped until the IH and the FTL decide on a course of action that will allow safe operations (e.g., an upgrade in PPE level).

Periodic evaluation of employee exposure to hazardous substances and materials will be performed by the on-site IH, based on known/anticipated site conditions.

A.6.2.4 Levels of Protection. Engineering controls such as exclusion zone design and drill rig positioning will be used whenever feasible to minimize potential exposure and minimize the need for PPE beyond Level D. At the initial entry, each work location may be monitored for hazardous contaminants using appropriate instruments such as a PID, FID, combustible gas indicator, and radiation survey meters as described in Section A.6.2.3 of this plan.

A.6.3 Action Levels Regarding Limitations in Tasks Assigned, Personal Protective Equipment Requirements, and Withdrawal from Site

For all tasks, if organic vapor readings exceed 5 ppm sustained for 5 minutes or 50 ppm for 2 minutes in the worker's breathing zone, all work in the exclusion area will be stopped, and the situation will be assessed by the IH and the FTL. The values listed in Table A-4 comprise the selection criteria for PPE with respect to volatile organic compounds.

If field radiation detection instruments exceed 100 cab for beta/gamma or detect any alpha activity, all work in the exclusion area will be stopped, and the situation will be assessed by the HPT. Any additional requirements from the *EG&G Idaho Company Procedures Manual* (EG&G Idaho, 1992f) and *Radiological Controls Manual* (EG&G Idaho, 1992g) will be followed.

If the combustible gas indicator exceeds 10% of the LEL, the on-site IH will stop operations until the level drops.

If any worker faints, becomes dizzy, sick, or generally incoherent, all work in the exclusion zone will be stopped. All workers will leave the exclusion zone, and the situation will be assessed by the IH, the HPT, and the FTL.

Table A-4. Values using organic vapor analyzers (PID/FID).

Reading of	Requires
0-5 ppm	Level D Personal Protective Equipment
5-10 ppm	Level C Personal Protective Equipment
10-500 ppm	Level B Personal Protective Equipment
500 ppm +	Level A Personal Protective Equipment

The Project Manager will be notified of any event in which action levels are exceeded, work is stopped, and situations are evaluated by the IH (HSO), HPT, and/or FTL.

A.7 SAFE WORK PRACTICES

The safe work practices listed in Section 7 of the generic H&S Plan (EG&G Idaho, 1991) are excellent general practices. These safe work practices will be adhered to for all tasks. Additionally, a Safe Work Permit will be obtained for all tasks.

All drilling operations will be performed in accordance with the DOE-ID *Drilling Safety Manual* (DOE-ID, 1983). Pre-drilling safety practices include the following:

- Set up an exclusion zone, delineated with barrier tape, rope, or traffic control cones, 20-30 ft around the drill rig.
- Check the outrigger jack location for stability before the mast is to be raised.
- Inspect the condition of all equipment.
- Inspect cables, making sure none are frayed.
- Make sure the cable hook has a safety latch to prevent hoisted objects from falling off the hook.
- Ensure that all guards are in place.
- Inspect the cathead rope to ensure that it is dry, in good condition, and is attached properly.
- Make sure all engine shut-off switches operate properly and that all personnel are familiar with their locations and use.
- Clear objects and personnel from the mast/rig area before raising the mast.
- Check to make sure the mast is bolted in place to prevent it from coming down while drilling.
- Move and secure all lines away from the rotary area.
- Show all personnel the location of the rotary shut-off switches and how to operate them.
- Move any objects that could present trip hazards near the drill rig.

The FTL or designate will inspect the drill rig prior to use to ensure that the equipment is functioning safely and properly and the air/hydraulic lines are secured.

The safe work practices for drill rig operations include the following:

- Drilling will cease during rain, high winds, or lightning.
- The rig shall be operated by a person certified by the Idaho Department of Water Resources. The operator must be able to identify pending failures and supervise the drilling assistants.
- The terrain should be level and the condition of the ground such that unexpected movement of the rig will be unlikely.
- Employees involved in the drilling operation shall not wear any loose and/or poorly-fitted clothing which could get caught in any exposed moving machinery. Footwear shall be steel-toed.
- If dusty conditions prevail, the on-site IH (HSO) will evaluate the situation for the appropriate level of personal protection.
- Emergency stop devices are required for the prime movers on drilling rigs to allow the operator or others to quickly respond to an emergency and prevent an accident or at least limit the injury. Emergency stops must be manually reset before restarting prime movers.
- The area should be roped off, marked, or posted to keep the area clear of pedestrian traffic spectators.
- Two 20 lb ABC fire extinguishers shall be readily available for use.

A.8 WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY

To reduce the spread of hazardous substances and materials by workers from potentially contaminated areas to clean areas, a controlled area consisting of three work zones (exclusion zone, decontamination and contaminant reduction zone, and support zone) will be established and clearly marked at each Track 2 site (see Figures A-4, A-5, and A-6). The size and number of zones will be based on the known or suspected degree of hazard. Site entry will be controlled to minimize the number of individuals within the controlled area. Unnecessary personnel will be excluded and only authorized visitors will be allowed to enter this area.

Exclusion zones will be clearly delineated with black and yellow barrier tape, rope, or traffic control cones. Access to the exclusion zone will be limited to personnel who have received the

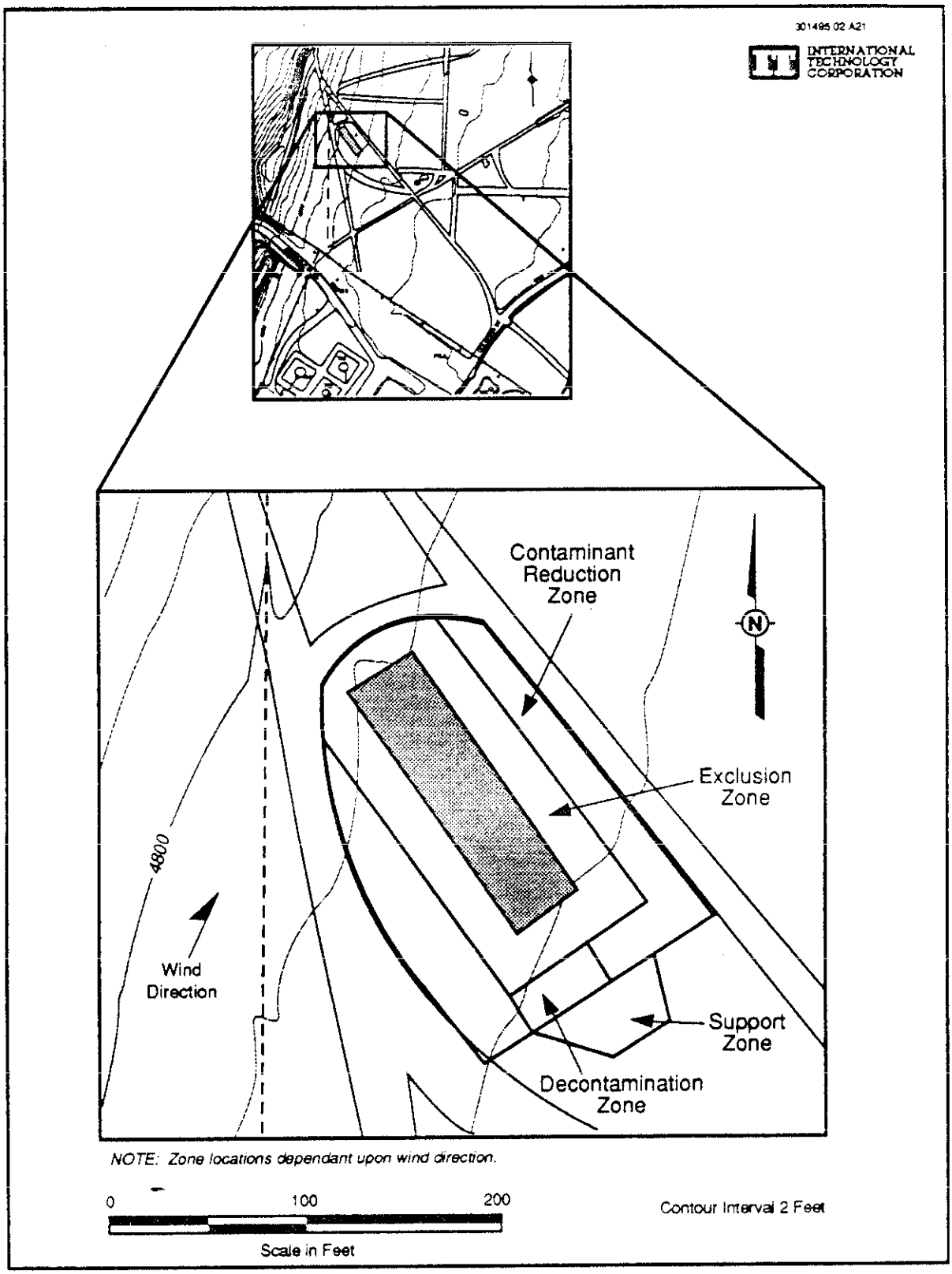

Figure A-4. Locations of exclusion, contaminant reduction, decontamination, and support zones at the OU 1-03 TSF-03 burn pit.

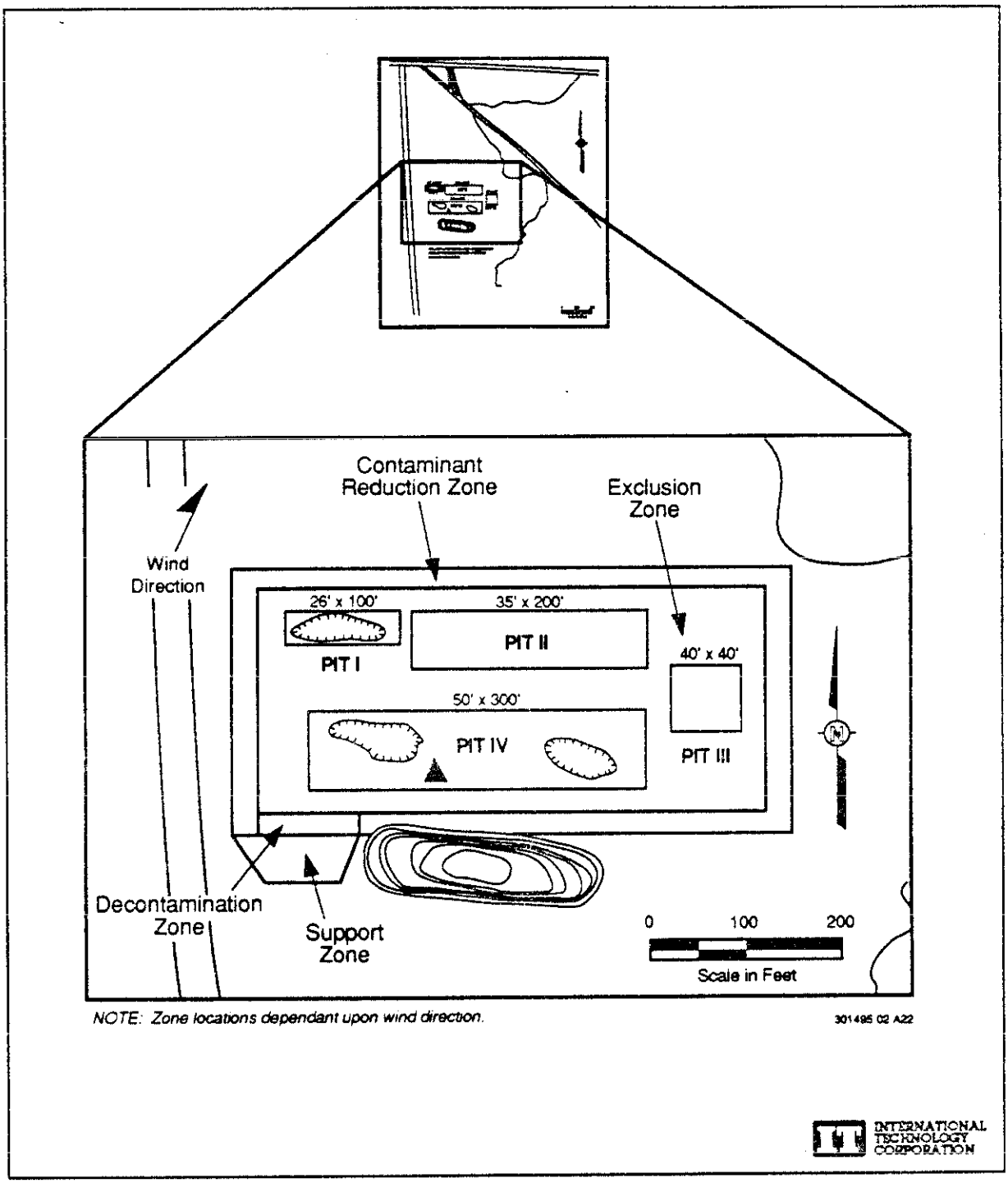

Figure A-5. Locations of exclusion, contaminant reduction, decontamination, and support zones at the OU 1-03 WRRTF-01 burn pits.

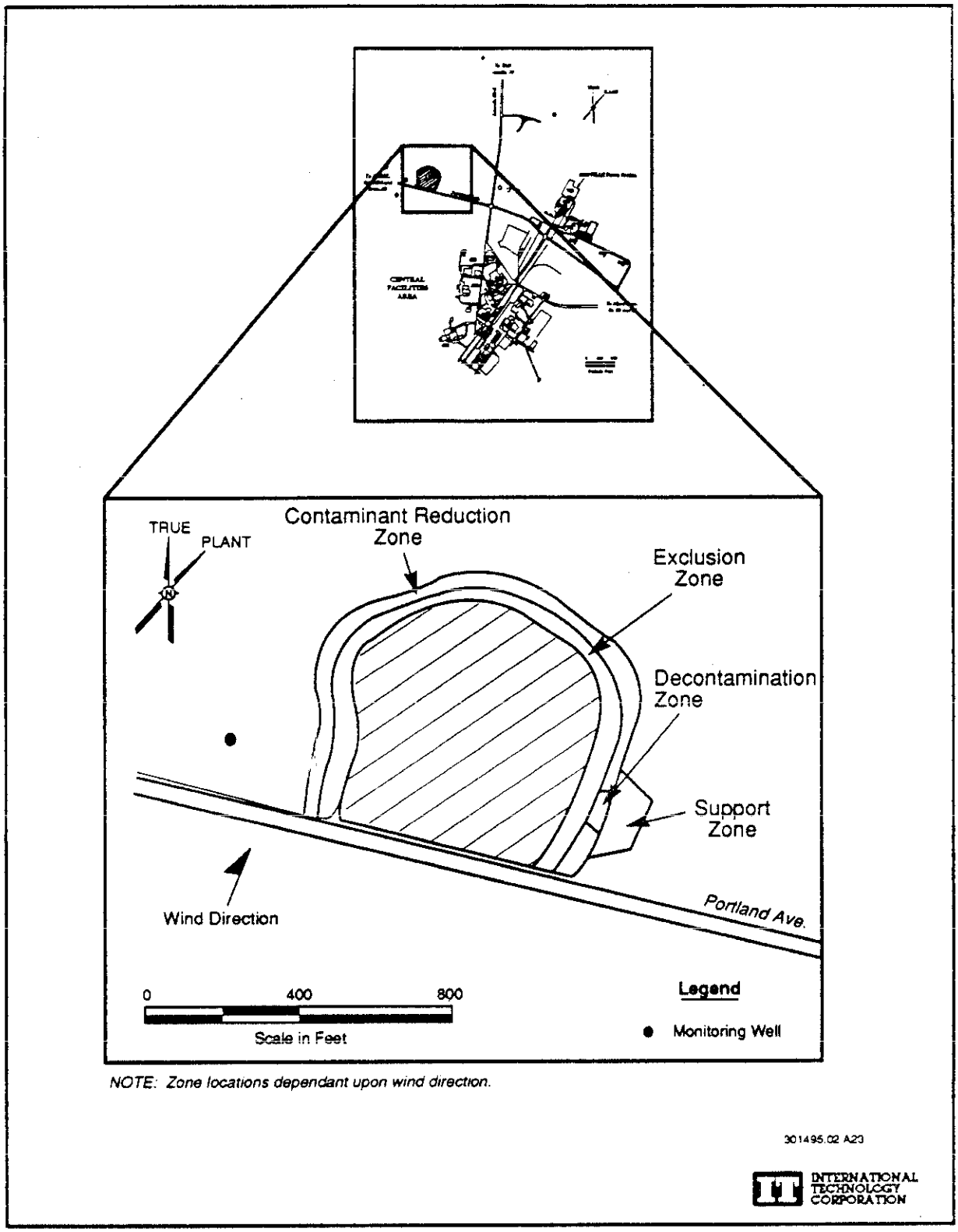

Figure A-6. Locations of exclusion, contaminant reduction, decontamination, and support zones at the OU 4-10 CFA Landfill I.

required training described in Section 3 of this H&S Plan. In the exclusion zone, collected samples will be placed in appropriate sample containers, and the sample containers will be placed in Ziploc® bags.

The decontamination/contaminant reduction zone will consist of an area set up for decontamination of personnel and small equipment that has been in contact with the exclusion zone. All decontamination supplies will be located in, and decontamination will take place in, the decontamination zone. Materials not able to be decontaminated will be placed in a labeled container and disposed of or transported to another suitable location for decontamination. Samples packaged in the exclusion zone will be passed to the decontamination zone. All items will be surveyed for radioactivity by the HPT prior to being moved into the support zone or being removed from the site.

The support zone (i.e., the site trailer) will be established outside the decontamination zone and will include an area for staging emergency response equipment, such as the eye wash and fire extinguishers, during site operations. The support zone will remain clean and free of soil and contaminated equipment.

A.9 ENVIRONMENTAL AND PERSONNEL MONITORING

A.9.1 Operations and Monitoring Equipment

The IH and HPT will open the field site daily, check the calibration of instruments (see Table A-5), and perform or update the Safe Work Permit and/or the job hazard assessment.

An HNU PID, OVA FID, or equivalents, will be used for detecting organic vapors. Monitoring for organic vapors will be conducted by the on-site IH to ensure that levels do not exceed those presented in Section A.6.3 of this plan. The type of organic vapor detection equipment used will be determined by the on-site IHs. A combustible gas indicator will be used to monitor for combustible gases, oxygen, and toxic gases, and to ensure that levels do not exceed 10% of the LEL. A wet bulb globe temperature (WBGT), or equivalent, heat stress monitor and a noise dosimeter will be used to monitor heat stress conditions and noise levels, respectively. All equipment used by the IHs will be maintained by them per the manufacturer's recommendations.

A Ludlum 2A with a pancake-style GM detector, or equivalent instrument, will be used for detecting beta/gamma contamination. An instrument for alpha monitoring (ASP-1, Ludlum 61, or equivalent) will be used to monitor for alpha emitters at these Track 2 sites. Radiological surveys will be conducted to make sure that levels are less than 100 cpm above background beta/gamma, that there

Table A-5. Typical operations and monitoring equipment for the OU 1-03 and OU 4-10 Track 2 investigations.

Type of Equipment	Number Needed	Calibrated[a]
HNU PID, OVA FID, or equivalent	1	Daily[b]
Ludlam 2A, or equivalent	1	Biannually
Ludlam 14-c, or equivalent	1	Biannually
Combustible gas indicator	1	Daily[b]
Ludlam 61, or equivalent	1	Biannually
Noise dosimeter	1	Daily[b]
Wet bulb globe temperature (WBGT) heat stress monitor, or equivalent	1	Daily[b]

a Calibration methods are contained in the *EG&G Idaho Company Procedures Manual*, Number 11.4, "Calibration of Industrial Hygiene Instruments", or will be calibrated according to the manufacturer's instructions.
b Calibrate every time equipment is turned on.

is no detectable alpha, and to determine PPE to control exposure to any radioactive contaminants.

Monitoring for VOCs, combustible gases, and radioactivity will be continuous during drilling operations. Noise level and heat stress monitoring will be intermittent (approximately 4 hours per day). Table A-5 list the types of operations and monitoring equipment and their calibration frequencies.

A.9.2 Medical Surveillance Procedures

Enrollment in the EG&G Idaho medical surveillance program for hazardous waste site workers is required for all task site workers not already participating in such a program. Enrollment in a hearing conservation program may be required for some persons if noise exposures exceed the 8-hour time-weighted average (TWA) of 85 dB(A). Noise exposures will be evaluated on an individual basis, as needed.

A.9.3 Personnel Monitoring

For all tasks to be performed, the following personal monitoring device(s) shall be used:

- Breathing zone measurements will be taken using a PID or FID.
- Whole body frisks and surveys of the site will be conducted by the HPT to assess contamination levels. Whole body frisks will be conducted on site workers when they enter the decontamination zone from the exclusion zone. A site survey will be performed at the site before any site activities commence. These surveys will be conducted in accordance with the *Radiological Controls Manual*, Chapter 4, "Radioactive Contamination Control" (EG&G Idaho, 1992g).
- TLD badges will be worn by all personnel entering the exclusion zone.
- Combustible gas indicators will be used to monitor for gases in the boreholes during drilling.

A.9.4 Operating Procedures and Methods for Surveillance

The FTL will be responsible to follow the guidelines set forth in the generic H&S Plan (EG&G Idaho, 1991) for (a) heat and cold stress (Section 9.4), (b) work stress (Section 9.4), (c) barriers, signs, and tags (Section 9.6), and (d) physical hazard control and monitoring (Section 9.6).

A.10 DECONTAMINATION PROCEDURES

A.10.1 Decontamination of Personnel

All personnel entering the exclusion and decontamination zones will wear the required PPE. When exiting the exclusion zone and entering the decontamination zone, a whole-body frisk for detection of radiological contamination will be performed by the HPT. If personal radiological contamination has occurred, the HPT will assist with decontamination according to the requirements outlined in EG&G Idaho Company Procedure 10.4, "Decontamination of Personnel and Personal Property" (EG&G Idaho, 1992f).

PPE should be removed in the decontamination zone in the following order:

- Hard hat
- Disposable shoe covers
- Coveralls or Tyvek
- Eye protection
- Latex gloves.

After exiting the task site, all personnel should wash any exposed skin thoroughly before eating, drinking, smoking, chewing, or using the restroom.

A.10.2 Decontamination of Drilling, Sampling, and Monitoring Equipment

Prior to decontamination, all equipment will be surveyed by the HPT for radiological contamination.

Decontamination and cleaning of drill rigs and other drilling equipment will be accomplished by using a high-pressure steam cleaner and uncontaminated tap water. For persistent contamination, the washing will be followed by a methanol rinse and an organic-free water rinse. Methanol will be used to remove any adhering film that is not soluble in water. This solvent was selected because it is not expected to be found in the waste at these Track 2 sites and because it is not a laboratory contaminant. Methanol will be stored in labeled, exclusive-use bottles. Personnel performing decontamination procedures will read the MSDS for proper safe use and handling (see Appendix C). Decontamination procedures are documented in the SAPs (EG&G Idaho, 1992a and b), in ERD Standard Operating Procedure (SOP) 11.4, "Field Decontamination of Heavy Equipment, Drill Rigs, and Drilling Equipment" (EG&G Idaho, 1992h), and in the EG&G Idaho Geosciences Unit *Field Sampling Method (FSM #8) Decontamination* (EG&G Idaho, 1992i).

Sampling equipment is decontaminated by washing and scrubbing using a nonphosphate detergent, followed by a potable water rinse, an organic-free water rinse (if necessary), a methanol rinse (optional), and a second organic-free water rinse, followed by air drying. Sample equipment decontamination is documented in the SAPs (EG&G Idaho, 1992a and b), in the ERD SOP 11.5, "Field Decontamination of Sampling Equipment" (EG&G Idaho, 1992h), and in the EG&G Idaho Geosciences Unit *Field Sampling Method (FSM #8) Decontamination* (EG&G Idaho, 1992i).

The decontamination water will be contained, drummed, and stored at the Area of Contamination as specified in each SAP (EG&G Idaho, 1992a and b), and disposed of appropriately, depending upon sampling results. The WAG Manager of the TAN Portable Water Treatment Unit (PWTU) may accept the decontamination water if it meets acceptance criteria.

A.10.3 Decontamination Modification (e.g., surfaces, materials, instruments, equipment)

Monitoring instruments and other equipment will be cleaned of soil or decontaminated with tap water before it is removed from the decontamination reduction zone. The cleaned instruments and equipment will be surveyed with field instruments for hazardous and radiological contamination.

A.10.4 Disposal Procedures

Disposal of cuttings, decontamination fluids, sampling equipment, PPE, and samples is addressed in Section 1.7 of the respective SAPs (EG&G Idaho, 1992a and b).

A.11 EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION

A.11.1 Emergency Reference List

Table A-6 lists the current emergency numbers for INEL, CFA, and TAN.

A.11.2 Emergency Routes

During dayshift, Monday through Thursday, the TAN medical facility located at TAN-603 (phone 526-6263) is staffed from 7:30 a.m. to 5:30 p.m. by a full-time nurse. The CFA medical facility is fully staffed Monday through Friday from 7:30 a.m. to 4:30 p.m. Assistance for any serious emergency in the TAN and CFA areas may be obtained through the CFA medical facility, where staffing is minimized during off hours (phone 526-2356).

Table A-6. Emergency reference list.

INEL - Wide Emergency Contacts	
Warning Communication Center (WCC)	777
Area Emergency Action Director	6-2830
First Aid	6-6263
Occupational Medical Program	6-2356
Ambulance	777
Fire	777
Security	777
Explosives expert (Richard Green)	6-2702
OU 4-10 CFA Landfill I Emergency Contacts	
Field Team Leader (IT Corp.-TBD)	F-net
Project Manager (T. J. Meyer)	5-5928
CFA Industrial Hygiene (Bob Parker)	6-4645
CFA Area Health Physics Technician (CFA F&M-TBD)	6-6619
CFA Area Safety (Jim Southwick)	6-6347
WAG 4 Manager (Bill Pigott)	5-5894
CFA Medical Facility	6-2356
OU 1-03 TSF-03 and WRRTF-01 Burn Pits Emergency Contacts	
TAN Industrial Hygiene (EG&G ERD CAU-TBD)	6-9618
TAN Area Health Physics Technician (CFA F&M-TBD)	6-6619
TAN Area Safety (Parley Williams)	6-6004
TAN Area Operations Shift Manager	6-2509
Field Team Leader (IT Corp.-TBD)	F-net
Project Manager (T. J. Meyer)	5-5928
WAG 1 Manager (Jerry Zimmerle)	5-5892
TAN Medical Facility	6-6263

This emergency reference list will be posted at each site.
TBD = To be determined.

A requirement of this H&S Plan is that workers not already familiar with the location of the facilities mentioned above must tour the facilities before doing any work described in this plan. The FTL will conduct any necessary tours.

Figures A-7, A-8, and A-9 show the locations of the TSF-03 and WRRTF-01 burn pits and the emergency routes to the TAN medical facility (TAN-603). Figure A-10 shows the location of the CFA-01 landfill and the emergency route to the CFA medical facility (CFA-603). These informative figures will be posted at the respective Track 2 sites. Figure A-11 shows the emergency route to the CFA in case serious emergencies occur at either of the two TAN sites.

DOE-ID firemen are qualified to render first aid. The DOE fire department also maintains a hazardous material (HAZMAT) van equipped to respond to an emergency involving a release of a hazardous material.

A.11.3 Emergency Procedures

In general, emergency procedures given in Section 11 of the generic H&S Plan (EG&G Idaho, 1991) will be followed. In case of a large-scale emergency or major personnel injury, the respective TAN and CFA Area Emergency Plans will be implemented by the respective Facility Managers.

A.11.3.1 Additional or Modified Emergency Procedures. The F-net radio communication system will be available at the work site at all times, and will be provided by the HPT and the FTL. A portable eye-wash station, a basic radiological contamination spill kit, a first aid kit, and two 20-lb ABC fire extinguishers will be available at the work site at all times. A vehicle will also be in close proximity and accessible during the entire project. Hand signals and the buddy system per Section 11.1.7 in the generic H&S Plan (EG&G Idaho, 1991) will be reviewed and followed in an emergency.

A.11.3.2 Requirements for Task Site Evacuation. The FTL will evaluate and establish evacuation routes prior to the start of activities at each site based on the information in Figures A-7 through A-11. The evacuation routes will follow the shortest distance over accessible roads to the medical dispensary in TAN-603 (Figure A-8) or the medical dispensary at CFA-603 (Figure A-10). Notification will be performed by notifying the dispensary directly, by calling the warning communication center, and by contacting the shift manager. If deemed necessary, patients from TAN may be transferred to CFA-603 (Figure A-10) by medical personnel. CFA-603 is located 27 miles south of TAN (Figure A-11). Normal travel time is approximately 45 minutes. This information will be posted in the Field Logbook at the task site.

INTERNATIONAL TECHNOLOGY CORPORATION

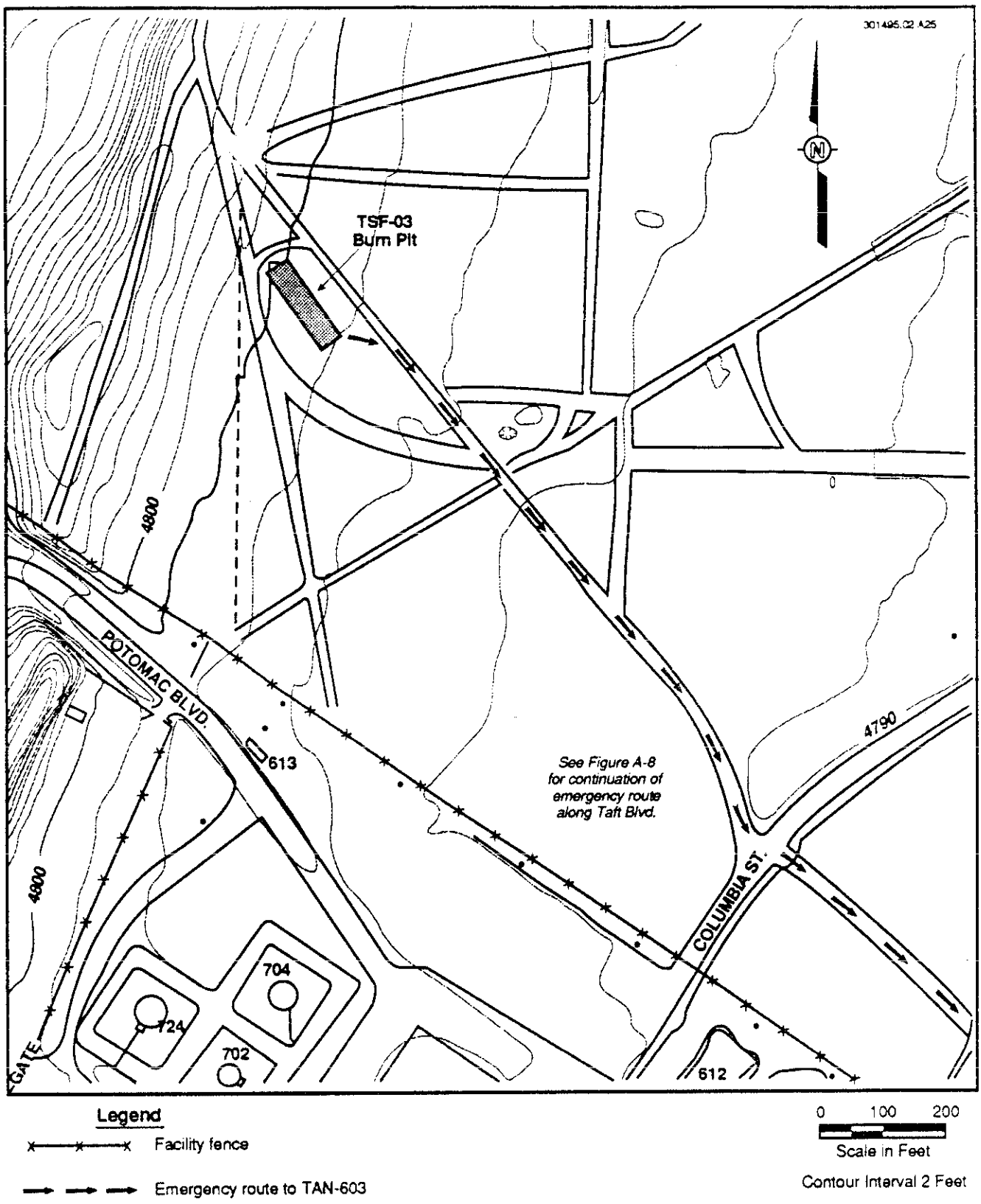

Figure A-7. Location map of the TSF-03 burn pit and emergency route to the TAN medical facility.

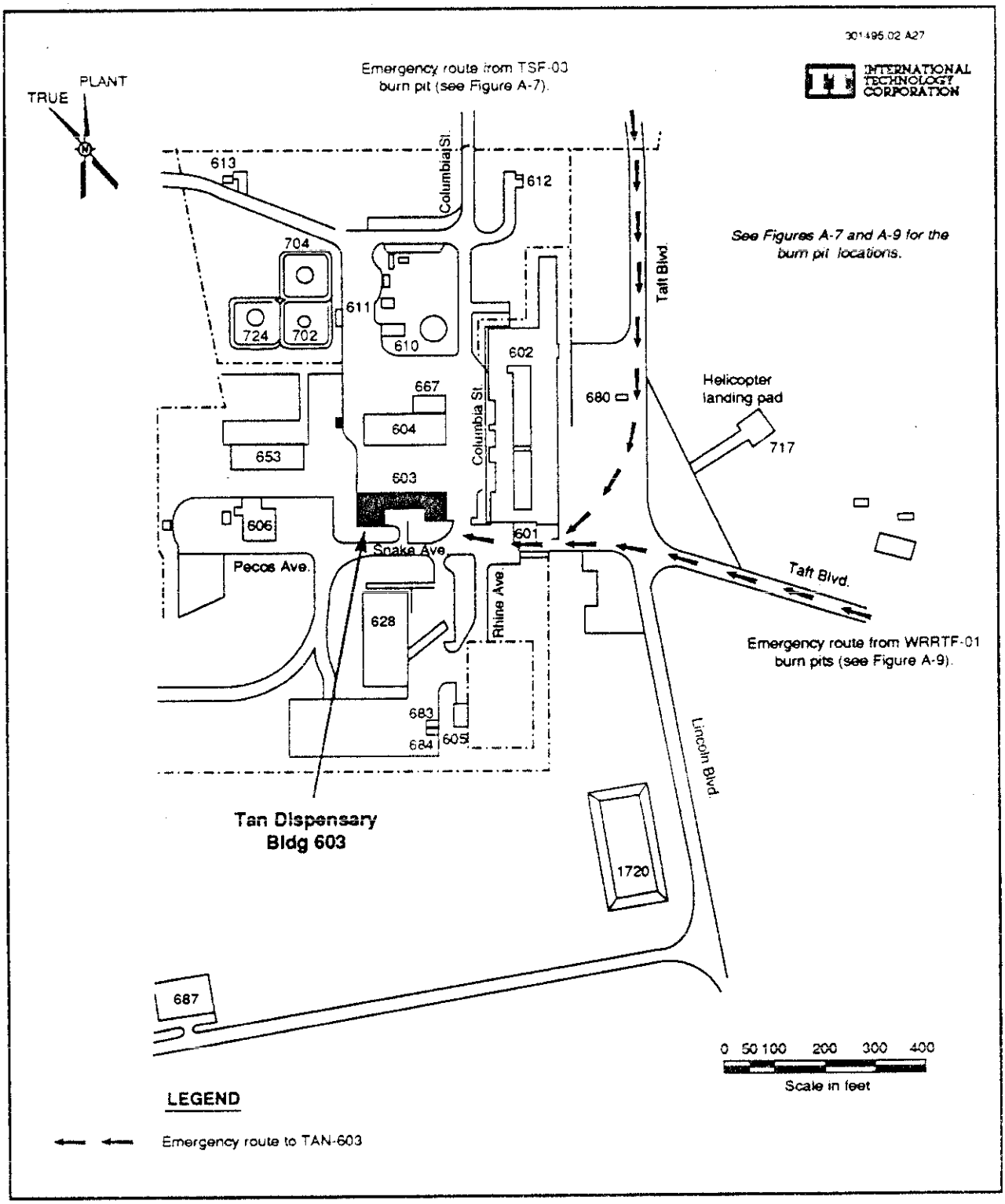

Figure A-8. Location map of TAN-603 (the TAN medical facility) and emergency routes from the TSF-03 and WRRTF-01 burn pits.

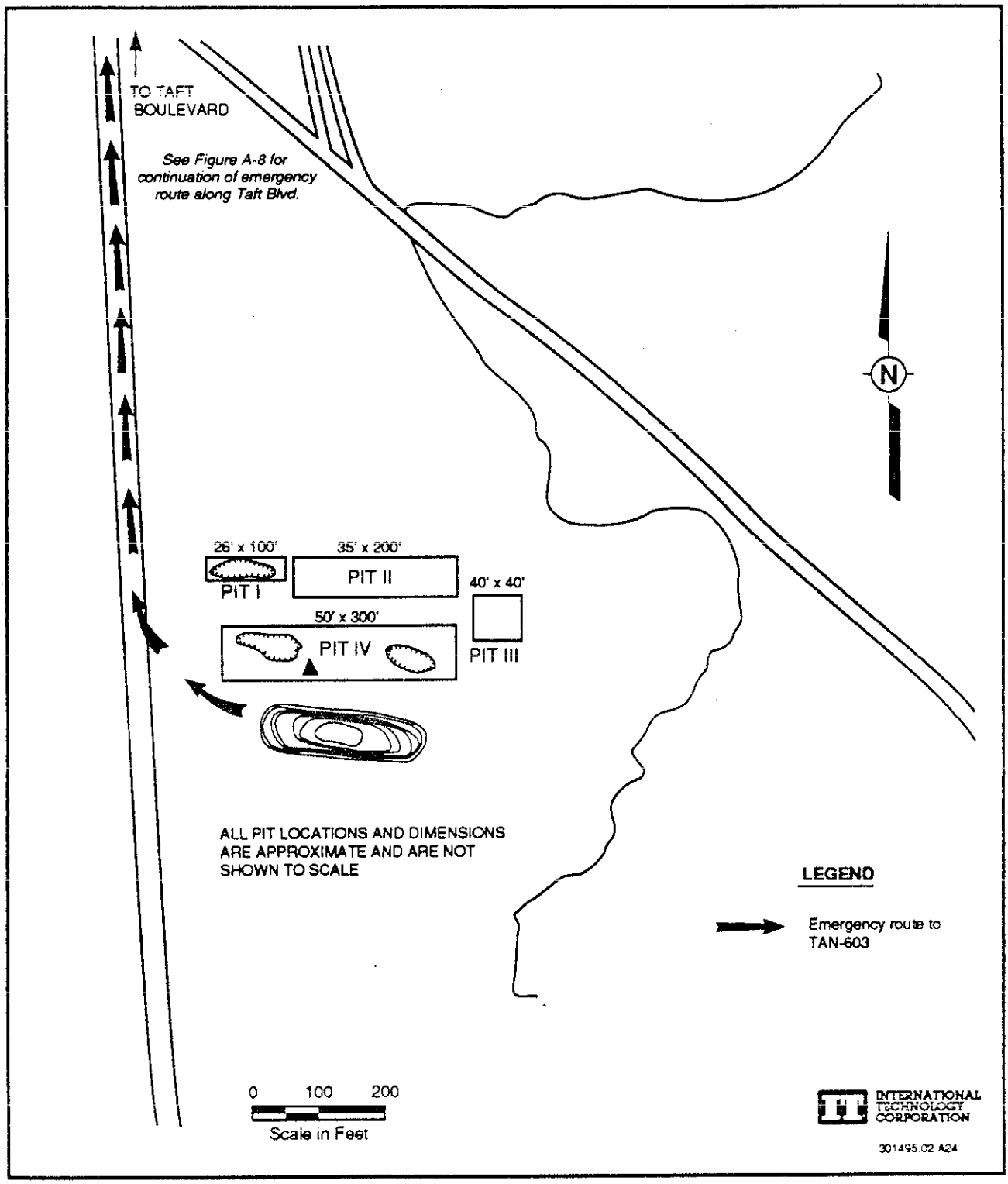

Figure A-9. Location map of the WRRTF-01 burn pits and emergency route to the TAN medical facility.

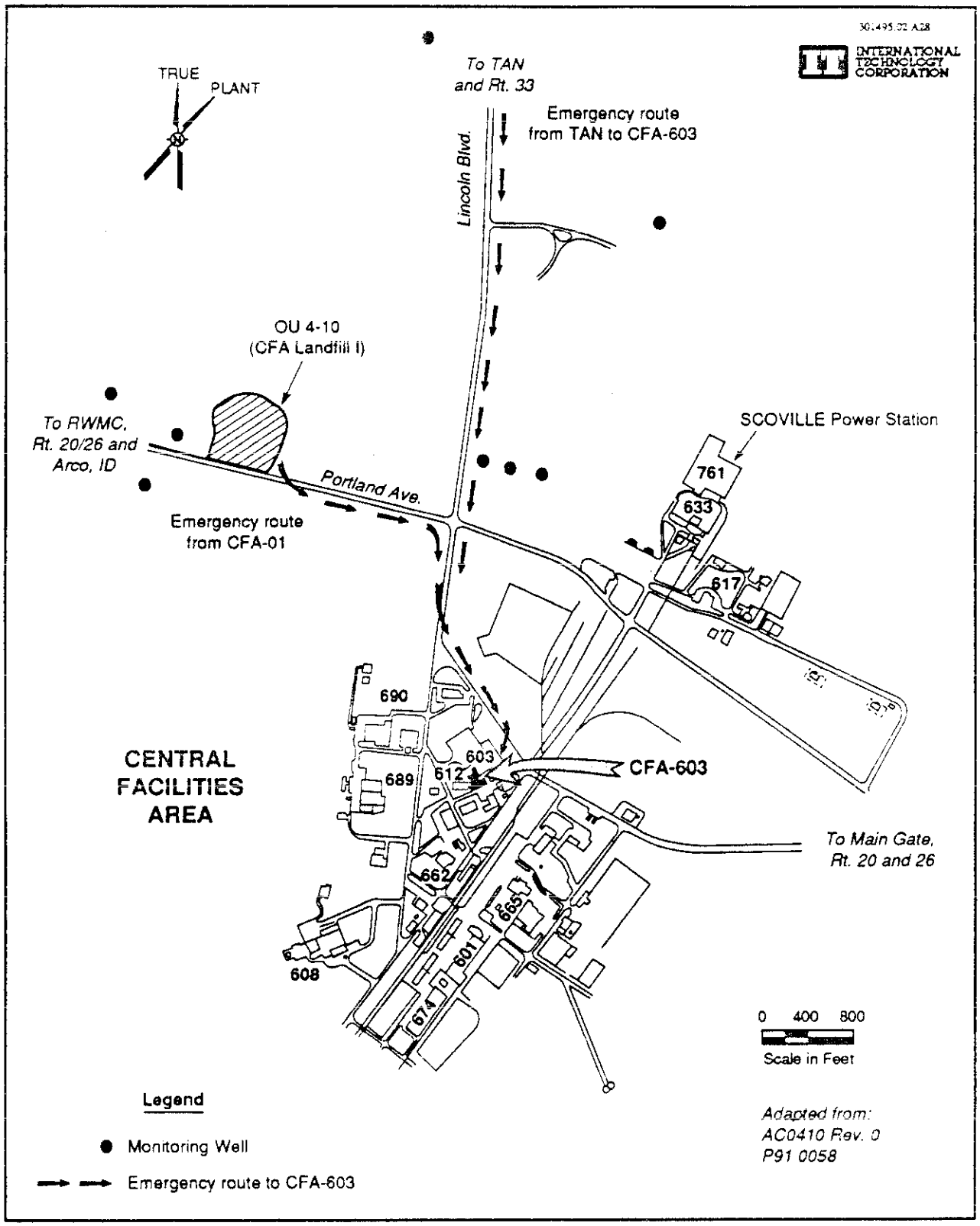

Figure A-10. Location map of the CFA-01 landfill and emergency route to the CFA medical facility.

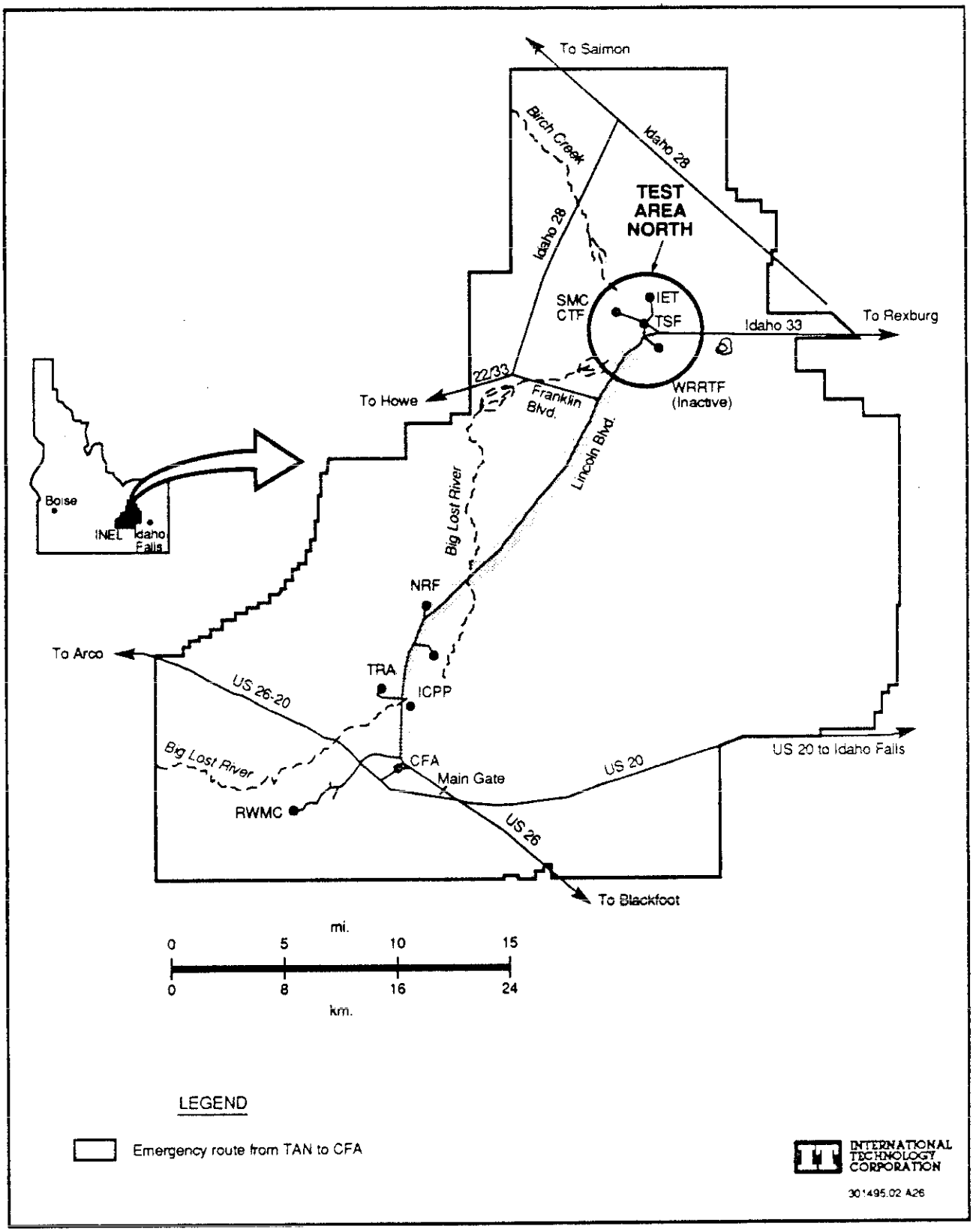

Figure A-11. Emergency route to the Central Facilities Area from TAN.

Prior to starting work, the FTL will brief site personnel on the location of the emergency equipment and the evacuation procedures and route. The FTL will put a copy of Figures A-7 through A-11 (as appropriate to each site) in the Field Logbook that will have a highlighted site-specific evacuation route.

A.11.3.3 Task Site Warning Devices.

- Portable two-way F-net radio will be available at all times at each site
- Facility sirens for general area emergencies
- Hand signals for task specific emergencies [see Section 11.1.7 of the generic H&S Plan (EG&G Idaho, 1991)].

A.11.3.4 Task Site Emergency Responsibilities. Table A-7 shows the responsibilities of task site personnel. Any task site personnel trained in first aid and/or cardiopulmonary resuscitation (CPR) may administer these life-saving techniques to emergency victims.

A.11.3.5 Procedures for Inclement Weather. Operations will cease in the event of winds exceeding 25 mph on a sustained basis, electrical storms, heavy rains, or heavy snow as determined by the FTL and on-site IH or HPT.

A.11.3.6 Reentry Procedures. If a task site emergency results in the evacuation of the task site, personnel shall reenter the task site only as directed by the FTL as specified in Section 11.1.10 of the generic H&S Plan (EG&G Idaho, 1991).

A.11.4 Emergency Equipment

Equipment will be inspected and maintained by the technicians. The FTL will check all emergency equipment prior to starting operations (Table A-8).

A.12 ADDITIONAL INFORMATION

Offsite personnel requiring entrance to the exclusion zone for a limited time, but not performing work that involves the potential disturbance of or contact with contaminated materials, will be allowed access if escorted by the site HSO or the FTL, but only during periods when no hazardous substances can be encountered, no hazardous operations are occurring, and/or hazardous operations have ceased. These personnel will not enter the exclusion zone unless they have the appropriate site-specific training (see Table A-3). Training shall be verified by the FTL. All visitors to the site shall be briefed regarding task site hazards by the FTL prior to entering the site.

Table A-7. Responsibilities of task site personnel.

Name	Responsibility	Action
IT Corp.-TBD	Field Team Leader	Direct task emergency site
TBD	Drilling	Evacuation
EG&G Idaho Personnel	HPT/IH	Recommend protective measures
EG&G Idaho/IT Corp.-TBD	Sampling	Call for help as directed
G. W. Braun (EG&G Idaho)	TAN Facility Manager	Initiate large scale emergency action as needed
W. W. Wyland (EG&G Idaho)	CFA Facility Manager	Initiate large scale emergency action as needed

TBD: To be determined. Names of specific personnel will be entered into the IH and FTL logbooks and Safe Work Permit at the start of each task.

Table A-8. Emergency equipment.

Fire extinguishers -	
Number Available:	2
Location:	On the transportation vehicle
Maintenance schedule:	Monthly inspections by the IH
First Aid Kits (see Table A-9) -	
Number Available:	1
Location:	On the transportation vehicle
Maintenance schedule:	Inventoried prior to and after each use by the IH
Portable eyewashes -	
Number Available:	1
Location	On the transportation vehicle
Maintenance schedule:	Shall be stored empty. Prior to sampling activities, it shall be filled with clean water and maintained by the IH
Basic radiological contamination spill kit (see Section 11.3 of the generic H&S Plan) -	
Number Available:	1
Location:	On the transportation vehicle
Maintenance schedule:	Inventoried prior to and after each use by the HPT

Table A-9. First aid supplies.

Task	Location
All	Transport vehicle

Items:

2 boxes of triangular bandages
2 boxes of 4-inch bandage compresses
1 box of gauze pads
1 box of knuckle bandages
3 boxes of 1-inch adhesive bandages
1 box of wound wipes
1 box of iodine wipes
1 box of burn compound
1 box of scissors and forceps
1 box of adhesive tape
1 box of eye pads
1 box of ammonia inhalers

Personnel with only incidental contact with the task will not be required to read this H&S Plan but will be briefed on site emergency procedures. The decision concerning incidental classification will be made by the FTL in consultation with the HSO. If the requirement of reading this H&S Plan is waived, the worker will be escorted to the task site while his job is being performed.

The HSO will not be required to be on site whenever operations are present. However, this individual or designee will be available by at least radio or telephone for consultation concerning health and safety matters whenever operations are ongoing. When the HSO is not present, the FTL will be responsible for site safety.

A.13 HEALTH AND SAFETY CERTIFICATION FORM

Task Title:

Project Manager:

Field Team Leader:

I certify that I have been give a copy of the task-specific ERD Health and Safety Plan for the Track 2 OU 1-03 and OU 4-10 Investigations and agree to comply with the procedures described therein. I further certify that I understand the potential health and safety hazards of the program (as outlined in this Health and Safety Plan) and have been trained in the use of personal protective equipment selected for this task.

Employee:

_____

(Print) (Signature) (Date)

Company of Employment: _____

Field Team Leader:

_____

(Print) (Signature) (Date)

Health and Safety Officer:

_____

(Print) (Signature) (Date)

REFERENCES

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Appendix A

Scope of Work For
OU 1-03 Track 2 Investigation

SCOPE OF WORK FOR OU 1-03 TRACK 2 INVESTIGATION

1. Field Sampling Plan

TSF-02 Service Station Spill. The TAN 664 Building is a small service station limited to dispensing gasoline, propane, motor oil, windshield washer fluid and antifreeze. No maintenance is done there and, with the exception of empty containers, no wastes are generated. One spill of 217 gallons of gasoline occurred in 1981 or 1982, when the pump island hose disengaged from the pump island. The fuel was hosed down with water into the surrounding soils. Since the main contaminants of concern are volatile organics and the spill occurred over ten years ago, it is unlikely that any of the contaminants remain in the soil as a contaminant source. Finally, the site underwent a underground storage tank upgrade in FY-91. All observed contaminated soils were excavated at that time and confirmation soil samples were taken.

TSF-38 Bottle Site. In May 1991, 10 to 15 broken glass laboratory bottles, three intact bottles, several rusted ether cans and areas of stained soil were discovered approximately 100 yards east of the TSF gravel pit. The intact bottles were observed to contain an unknown solid material(s). The origin and history of the site is unknown. Field screening did not detect any radioactivity or organic vapors, respectively. An activity to remove the cans and bottles, along with any associated soil contamination, is scheduled for the Spring of 1992. The cleanup will be performed in accordance with Department of Energy procedures.

TSF-03 and WRRTF-10 Burn Pits. The TSF-03 and the WRRTF-01 Burn Pits were used for open burning of combustible waste, petroleum products and solvents from 1958 to 1975. The normal operating procedure at the burn pits was to burn every time materials were dumped. Therefore, it is likely that most of the volatile and semi-volatile hazardous materials would have been destroyed. The sites are now covered with soil and natural vegetation has been reestablished. The most likely contaminants present at these sites are heavy metals related to the processes at the TAN facilities (lead, chromium, and mercury).

2. Initial Evaluation

TSF-02 Service Station Spill. Based on the evaluation of existing information, it was determined that additional data collection is unnecessary. Therefore, with concurrence of the FFA/CO Project Managers, no further action is recommended for this site. The basis for this determination will be documented further in the OU 1-03 Track 2 Summary Report.

TSF-38 Bottle Site. Based on the evaluation of existing information and anticipated removal activities, it was determined that additional data collection is unnecessary. Therefore, with concurrence of the FFA/CO Project Managers, no further action is recommended for this site. The basis for this determination will be documented further in the OU 1-03 Track 2 Summary Report.

TSF-03 and WRRTF-1 Burn Pits. Additional data for chromium, lead and mercury in the soil from the burn layers within the burn pits are required. Existing information regarding volatile organic compounds (VOCs) and radioactive contamination will be reevaluated, using new field screening data. If a risk evaluation determines that metal contaminants pose a risk of greater than a Hazard Index of 1 for non-carcinogenic contaminants and a cancer risk of greater than 10^{-4} for carcinogenic contaminants for the scenarios presented in the conceptual model, then no further action will be required at these sites. Otherwise, the sites would be transferred into an interim action or the WAG 1 comprehensive RI/FS.

3. Scope For OU 1-03

I. **TSF-03 - A.** The exact location of the burn pit will be determined by employee interviews and site visits. If the site has been regraded, revegetated, or is otherwise unnoticeable, a shallow trench will be excavated to find evidence of the burn pit location and the burn layer.

B. Four to eight randomly distributed soil samples will be collected from the burn layer and analyzed for chromium, lead, and mercury.

C. Field screening for VOCs in soil headspace and a field survey for gamma radiation will also be done. If positive results are detected for VOCs or gamma radiation, then confirmation samples will be sent for laboratory analyses.

D. If VOCs are detected in any samples during field screening, a second sample will be collected at the same location(s) at a depth of approximately 5 feet below the burn layer. A sample

for chromium, lead and mercury will also be collected. If positive results are detected for VOCs or gamma radiation, then confirmation samples will be sent for laboratory analyses.

E. One judgmental soil sample will be collected from the area of highest VOC contamination, based on the field screening and analyzed for chromium, lead and mercury. If no significant concentrations of VOCs are detected, then this sample will be collected from the center of the burn pit.

II. **WRRTF-01 - A.** In each burn pit, four to eight randomly distributed soil samples will be collected from the burn layer and analyzed for chromium, lead and mercury. One random soil sample will be collected from the center of each burn pit and also analyzed for chromium, lead and mercury.

B. Field screening for VOCs is soil headspace and a field survey for gamma radiation will also be done at each of the soil sample locations. If positive results are detected for VOCs or gamma radiation, then confirmation samples will be sent for laboratory analyses.

C. If VOCs are detected in any samples during field screening, a second sample will be collected at the same location(s) at a depth of 5 feet below the burn layer. A sample for chromium, lead and mercury will also be collected. If positive results are detected for VOCs or gamma radiation, then confirmation samples will be sent for laboratory analyses.

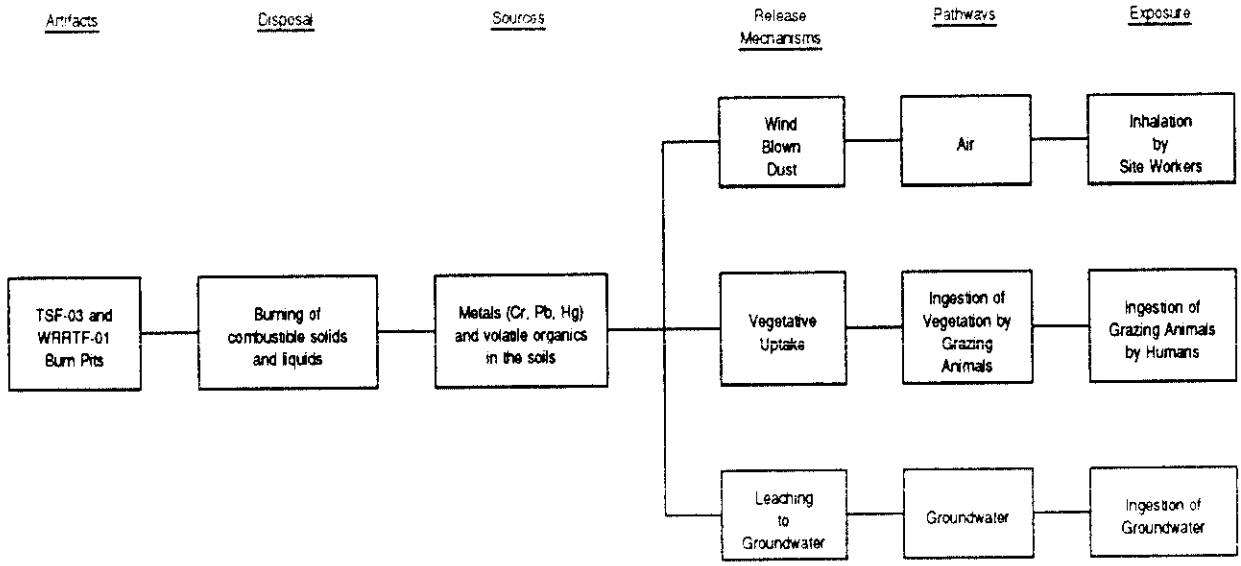

TABLE 1. Data Quality Objectives Summary for OU 1-03.

Data Quality Objective Elements	INEL WAG 1 OPERABLE UNIT 03	
	TSF-02 and TSF-38	TSF-03 & WRRTF-01 Burn Pits
Objectives(s)	Not Applicable	- Identify burn pit areas. - Identify soil contamination that may be within the burn pits. - Assess risk due to inhalation of dust by site workers and the ingestion of animals grazing at the site.
Data Quality Factors		
Prioritized Data Use(s)	Not Applicable	- Site characterization. - Risk Assessment.
Contaminants of Concern	Not Applicable	chromium, lead, mercury, volatile organics. (VOCs)
Risk-Based Level of Concern		
chromium lead mercury VOCs in soil headspace.	Not Applicable	Cr, Pb, Hg - Hazard Index > 1 and a carcinogenic risk > 10^{-4}. VOCs - 10% portable field instruments detection limits
Reporting Limit		
chromium lead mercury VOCs in soil headspace.	Not Applicable	Cr - 1000 ppb (CRDL) Pb - 500 ppb (CRDL Hg - 20 ppb (CRDL) - 10% CRDL for detected VOCs.
Analytical Levels	Not Applicable	Site Characterization and Risk Assessment I, II, III.
Critical Samples	Not Applicable	All confirmatory VOC samples.
Data Quality Needs		
Sample/Analysis Procedures 1 - Sample Collection 2 - Sample Analysis	Not Applicable	1 - Use DOE approved SOPs for sample collection. 2 - CLP-TAL for Cr, Pb, & Hg in soils & portable field instruments for VOCs in headspace.

5. Deliverables and Schedule

1.	Draft Scope of Work to EPA/IDHW.	12-11-91
2.	EPA/IDHW comments on draft SOW or DOE.	01-16-92
3.	Draft FSP to EPA/IDHW.	03-17-92
4.	EPA/IDHW comments on draft FSP to DOE.	04-14-92
5.	Revised Final FSP that incorporates EPA/IDHW comments approved by DOE.	04-28-92
6.	Draft Summary Report to EPA/IDHW.	03-02-93
7.	EPA/IDHW comments on Summary Report to DOE.	03-30-93
8.	Revised Summary Report that incorporates EPA/IDHW comments.	04-27-93

Appendix B

Scope of Work For
OU 4-10 Track 2 Investigation

SCOPE OF WORK FOR OU 4-10 TRACK 2 INVESTIGATION

1. Site History and Background

CFA-01 Central Facilities Area (CFA) Landfill I. Operable Unit (OU) 4-10 consists of only one site; the CFA-01 CFA Landfill I. The CFA Landfill I operated as a Solid Waste Management Unit (SWMU) from the early 1950's to 1970 in conjunction with an incinerator. CFA Landfill I was operated such that material was incinerated and/or crushed, and then buried. The landfill was first used in 1951, mainly to provide a location for disposal of wastes generated by the construction of the CFA facilities. The CFA Landfill I gradually evolved into the INEL municipal landfill, however the exact time frame for this use is unknown. The landfill was abandoned in 1970-71, and has a final surface area of approximately 8-10 acres.

A wide variety of waste was disposed of in CFA Landfill I that consisted mainly of solid waste with probably some minor amounts of liquid waste. Since no exact disposal records exist for CFA Landfill I, the source term information from the subsequent CFA Landfill II, which had a waste stream similar to CFA Landfill I, will be used to determine the types of hazardous waste that could have been disposed of in CFA Landfill I. The predicted hazardous waste source term for the CFA Landfill I, based on the Industrial Waste Management Information System database for CFA Landfill II from 1971-1986, will be assumed to consist of paints, solvents, chemicals, heavy metals, heavy metal-bearing liquids, asbestos, and petroleum by-products that were incinerated and/or crushed prior to burial. Radioactive wastes were not disposed of at the CFA Landfills.

There are no reports of response actions at the site and there have been no known releases to the environment from the CFA Landfill I. Existing soil borings and monitoring well data from around CFA Landfills II and III have not indicated any migration of suspected contaminants from the landfills at the soil/bedrock interface, the first sedimentary interbeds or ground water (last collected in July 1991), based on monitoring requirements in 40 CFR 265.90 for landfills.

There are no current land uses at the CFA Landfill I. To the west of the CFA Landfill I, active landfilling operations are being conducted at CFA Landfill III. It is planned that the CFA Landfill I remain inactive, and eventually be closed in compliance with regulatory requirements.

2. Initial Evaluation

CFA-01. Additional data are required to determine; if volatile organics and metal contaminants are migrating from the landfill; and if those contaminants pose a risk greater or less than a Hazard Index of 1 for non-carcinogenic contaminants, and a cancer risk of greater or less than 10^{-4} to 10^{-6} for carcinogenic contaminants. If the risk estimate for the assumed exposure scenarios is less than the level of acceptable risk for the OU, no further action will be required. Otherwise, and interim action or RI/FS scoping will be recommended.

Additional data pertaining to cap design and landfill gas abatement are also required to determine the readiness for closure of the CFA Landfill I.

3. Scope for OU 4-10

Phase I - Site Mapping. Delineate the boundaries of the CFA Landfill I using existing site maps, aerial photographs and/or geophysical surveying. Construct a topographic map for the landfill surface at a scale of one inch equals one hundred feet with a 2-foot contour interval.

Phase II - Vapor Detection. Identify and characterize the presence of vapors emanating vertically through the surface cover and laterally past the boundary of the CFA Landfill I. Methane, petroleum and chlorinated hydrocarbon analytes will be required.

Phase III - Soil Cover Investigation. Identify and characterize volatile organics and metal contaminants within the landfill soil cover. Characterize the physical properties of the soil cover with respect to closure requirements.

Phase IV - Vertical Contaminant Migration Investigation. Drill 4 to 6 boreholes, and identify and characterize volatile organics and metal contaminants in soil/leachate samples from the landfill waste, at the soil cover/basalt interface and the first sedimentary interbed beneath the landfill. Evaluate the physical properties and thickness of the soils to help characterize the fate and transport of any potential migrating contaminants.

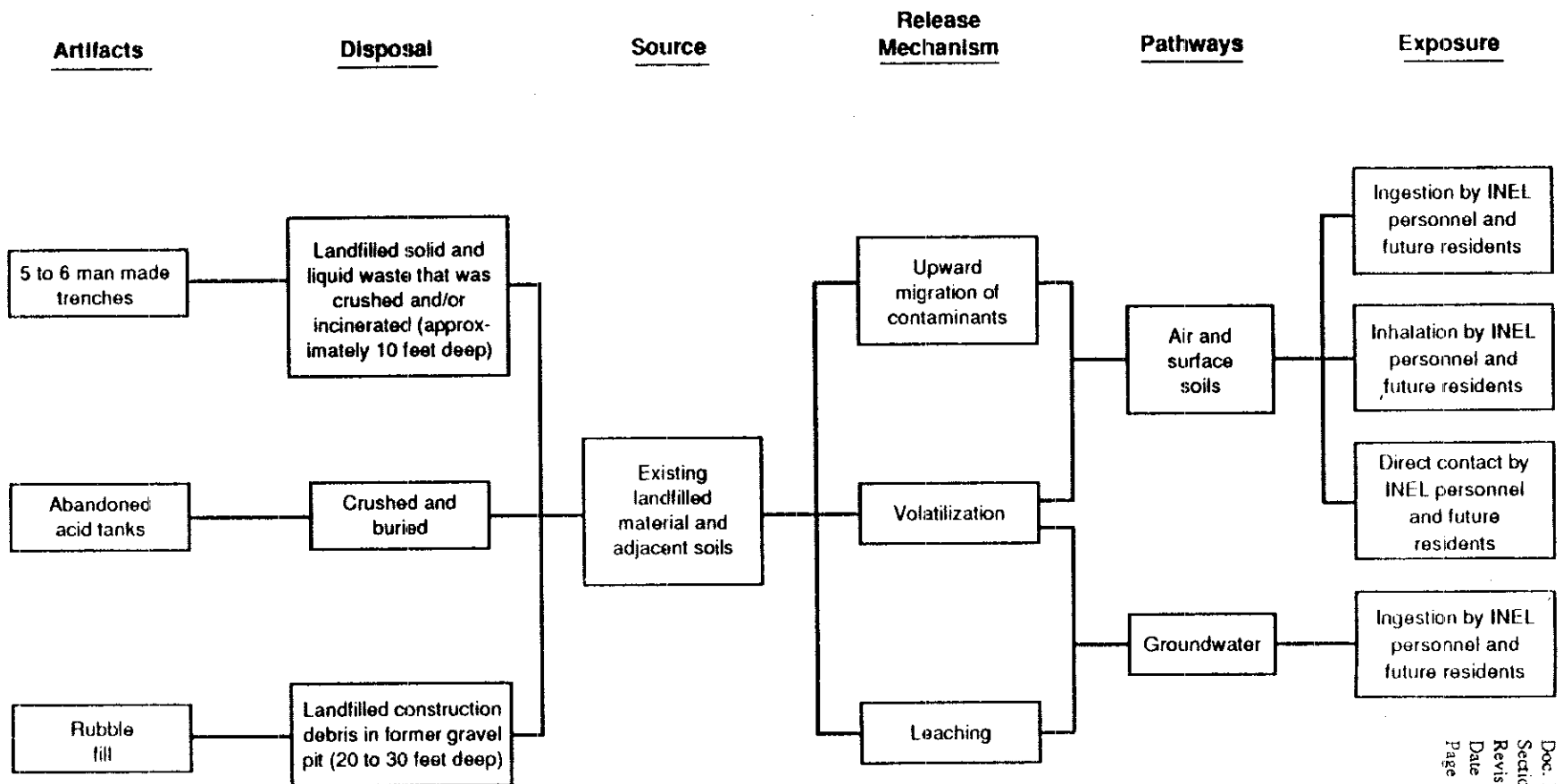

Figure 3. Conceptual model for OU 4-10 CFA landfill I

INTERNATIONAL TECHNOLOGY CORPORATION

301495.02 A16

4. Data Quality Objectives Summary

Data Quality Objective Elements	INEL WAG 4 Operable Unit 4-10
Objective(s)	- Define the boundaries of the landfill. - Determine if contaminants are migrating from the landfill and identify those contaminants. - Assess risk due to exposure to migrating contaminants. - Assess closure requirements for landfill.
Data Quality Factors	
Prioritized Data Use(s)	- Site Characterization. - Risk Assessment.
Contaminants of Concern	In soils: TCL volatiles and TAL metals. In soil vapor: methane, petroleum and chlorinated VOCs.
Risk-based Level of Concern	
Volatile organics (VOCs) Metals VOCs in soil vapor	Hazard Index > 1 or, a Carcinogenic Risk > 10^{-4}.
Reporting Limit	
1. In soils: volatile organics metals	1. CLP CRQLs for volatile organics and CRDLs for metals.
2. VOCs in soil vapor:	2. 10x the instrument D.L.
Appropriate Analytical Levels	- Site Characterization: I, II, III, V - Track 2 Risk Assessment: I, II, III, IV, V
Critical Samples	- One sample per analysis per soil layer from each borehole. - 70% completeness for surface soils and soil vapor samples.
Data Quality Needs	
Sample/Analysis Procedures - Sample Collection - Sample Analysis	1. Use DOE and/or EPA approved SOP procedures. 2. CLP for TCL volatile organics and TAL metals in soils. Laboratory PID/FID/ECD for methane, petroleum and chlorinated VOCs for soil vapor.

5. Deliverables and Schedule

1.	Draft Scope Of Work to EPA/IDHW.	02/07/92
2.	EPA/IDHW comments on draft SOW to DOE.	03/07/92
3.	Draft FSP to EPA/IDHW.	06/24/92
4.	EPA/IDHW comments on draft FSP to DOE.	07/23/92
5.	Revised Final FSP that incorporates EPA/IDHW comments approved by DOE.	08/06/92
6.	Draft Summary Report to EPA/IDHW.	05/18/93
7.	EPA/IDHW comments on Summary Report to DOE.	06/16/93
8.	Revised Summary Report that incorporates EPA/IDHW comments.	07/15/93

Appendix C

Material Safety Data Sheets for On-Site Hazardous Materials at the OU 1-03 and OU 4-10 Track 2 Site Investigations

M S D S

*** IDENTIFICATION ***

RECORD NUMBER : 267862
LANGUAGE : ENGLISH
PRODUCT NAME(S) : DIESEL FUEL
PRODUCT IDENTIFICATION DATA : VAN WATERS & ROGERS MSDS NO.: L0153
DATE OF MSDS : 1989-11-24

*** SUPPLIER INFORMATION ***

SUPPLIER/DISTRIBUTOR : Van Waters & Rogers Ltd (Canada)
ADDRESS : 9800 Van Horne Way
Richmond British Columbia
Canada V6X 1W5
EMERGENCY TELEPHONE NO.(S) : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

DIESEL FUEL

VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B.C. V6X 1W5

WHMIS CODES: B.3 D.2B

EMERGENCY ASSISTANCE

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC
(800) 424-9300.

FOR PRODUCT AND SALES INFORMATION

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

PRODUCT IDENTIFICATION

PRODUCT NAME: DIESEL FUEL CAS NO.:
COMMON NAMES/SYNONYMS: A COMPLEX MIXTURE VW&R CODE: L0153
OF ALIPHATIC, OLEFENIC, NAPHTHENIC AND AROMATIC HYDROCARBONS

FORMULA: MIXTURE DATE ISSUED: 06/88
HAZARD RATING (NFPA 704) SUPERCEDES: NONE
HEALTH: 1 HAZARD RATING SCALE:
FIRE: 2 0=MINIMAL 3=SERIOUS
REACTIVITY: 0 1= SLIGHT 4=SEVERE
SPECIAL: NONE 2=MODERATE

HAZARDOUS INGREDIENTS

			EXPOSURE LIMITS, PPM			
			OSHA	ACGIH	OTHER	
COMPONENT	CAS NO.	%	PEL	TLV	LIMIT	HAZARD
MIXTURE OF ALIPHATIC OLEFINIC, NAPHTHENIC AND AROMATIC HYDROCARBONS (UNREPORTED)		>99	100	100	NONE	COMBUSTIBLE

PHYSICAL PROPERTIES

BOILING POINT, DEG F: 216-371 VAPOR PRESSURE, MM HG/20 DEG C: 30
MELTING POINT, DEG F: N/A VAPOR DENSITY (AIR=1): 4
SPECIFIC GRAVITY (WATER=1): 0.85 WATER SOLUBILITY, %: INSOLUBLE
APPEARANCE AND ODOR: WHITE EVAPORATION RATE (BUTYL ACETATE=1): <1
OR PALE YELLOW LIQUID; PETROLEUM ODOR

----------FIRST AID MEASURES----------

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.

GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION. IF VOMITING OCCURS SPONTANEOUSLY, KEEP VICTIM'S HEAD BELOW HIS HIPS TO PREVENT HIS BREATHING THE VOMITUS INTO HIS LUNGS.

----------HEALTH HAZARD INFORMATION----------

PRIMARY ROUTES OF EXPOSURE: INHALATION, SKIN OR EYE CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: BREATHING VAPOURS MAY IRRITATE THE NOSE AND THROAT AND CAUSE COUGHING AND CHEST DISCOMFORT, AND ANESTHETIC.

EYE CONTACT: LIQUID AND MIST MAY IRRITATE THE EYES.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR RE-PEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS.

SWALLOWED: SWALLOWING THE LIQUID MAY RESULT IN VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, DO NOT ALLOW VOMITUS TO BE BREATHED INTO THE LUNGS AS EVEN A SMALL QUANTITY IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

----------TOXICITY DATA----------

ORAL: NO DATA FOUND

DERMAL: NO DATA FOUND

INHALATION: NO DATA FOUND

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

OTHER DATA: NONE

PERSONAL PROTECTION

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE VAPORS OR MISTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS.

APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

FIRE AND EXPLOSION INFORMATION

FLASH POINT, DEG F: 52 FLAMMABLE LIMITS IN AIR, %
METHOD USED: PMCC LOWER: 0.7 UPPER: 5.0
EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO_2, OR ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF- CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTINGUISH ALL NEARBY SOURCES OF IGNITION.

HAZARDOUS REACTIVITY

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

MATERIALS TO AVOID: STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE AND CARBON DIOXIDE.

SPILL, LEAK, AND DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. EXTINGUISH ALL IGNITION SOURCES. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL AND PLACE RESIDUE IN WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL.

CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES

TO ASCERTAIN PROPER DISPOSAL PROCEDURES.
NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

----------SPECIAL PRECAUTIONS----------

HANDLING AND STORAGE PRECAUTIONS: KEEP AWAY FROM HEAT, SPARKS, AND FLAMES. STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. VENT CONTAINER FREQUENTLY, AND MORE OFTEN IN WARM WEATHER, TO RELIEVE PRESSURE. ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT AND USE ONLY NON-SPARKING TOOLS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

----------PREPARATION INFORMATION----------

CONTACT MSDS CO-ORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

----------NOTICE----------

VAN WATERS & ROGERS LTD. EXPRESSLY DISCLAIMS ALL EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCT PROVIDED.

M S D S

Canadian Centre for Occupational Health and Safety

*** IDENTIFICATION ***

RECORD NUMBER : 204213
LANGUAGE : ENGLISH
PRODUCT NAME(S) : GASOLINE REGULAR UNLEADED
PRODUCT IDENTIFICATION DATA : PRODUCT CODE: C00000107304
DATE OF MSDS : 1989-10-12

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Sunoco Incorporated
ADDRESS : 36 York Mills Road
North York Ontario
Canada M5P 2C5
Telephone: 519-337-2301
EMERGENCY TELEPHONE NO.(S) : 519-337-2301 (24 hours) Brenda Anderson

*** MATERIAL SAFETY DATA ***

*** SECTION 1 - IDENTIFICATION ***

PRODUCT NAME - GASOLINE REGULAR UNLEADED
M.S.D.S DATE: 10/12/89
UN/NA NUMBER: UN1203
SYNONYMS.....: UNLEADED REGULAR GASOLINE
CAS REGISTRY NO:
CAS NAME.....: NO CLASSIFICATION - MIXTURE
CHEMICAL-FAMILY: A BLENDED MOTOR FUEL
INFORMATION:
SUPPLIER...: BRENDA ANDERSON
PHONE.....: 519-337-2301

*** SECTION 2 - INGREDIENTS ***

LIGHT PETROLEUM DISTILLATE CONTAINING MANGANESE ANTIKNOCK ADDITIVE (18 MG/L MN), BENZENE 0.1-2% USE AS A MOTOR FUEL ONLY. DO NOT USE FOR ANY OTHER PURPOSE. WHMIS CLASSIFICATION: CLASS B DIV 2; CLASS D DIV 2A UPON REQUEST.

*** SECTION 3 - PHYSICAL DATA ***

BOILING POINT.....: LT 100-437 (DEG. F) LT 38-225 (DEG. C)
MELTING POINT.....: N/A (DEG. F) (DEG. C)
SPECIFIC GRAVITY....: 0.74 (H2O=1)
PACKING DENSITY.....: N/A (KG/M3)
VAPOR PRESSURE.....: 325 - 525 (MM HG AT 20C)
VAPOR DENSITY.....: 4 (AIR=1)
SOLUBILITY IN WATER.: NIL (% BY VOL)
PH INFORMATION.....: N/A AT CONC. G/L H2O
% VOLATILES BY VOL..: 100
EVAPORATION RATE....: RAPID&VARIES (ETHYL ETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE.....: COLORLESS LIQUID. G
ODOR.....: GASOLINE ODOR

ODOR THRESHOLD.....: 15(EST) (PPM)

*** SECTION 4 - FIRE AND EXPLOSION DATA ***

FLASH POINT - 40 CLOSED CUP (DEG. F) -40 (DEG. C)
AUTOIGNITION TEMP. APPROX. 750 (DEG. F) APPROX. 400 (DEG. C)

—NFPA CLASSIFICATION— ——HAZARD RATING——
HEALTH - 1 0 - LEAST 3 - HIGH
FIRE - 3 1 - SLIGHT 4 - EXTREME
REACTIVITY 0 2 - MODERATE
SPECIFIC HAZARD
—FLAMMABLE LIMITS IN AIR—
LOWER EXPLOSIVE LIMIT (LEL) 1.5 % VOL.
UPPER EXPLOSIVE LIMIT (UEL) 7.6 % VOL.

FIRE AND EXPLOSION HAZARDS ————
EXTREMELY FLAMMABLE LIQUID (FLASH POINT LESS THAN 20F)

EXTINGUISHING MEDIA ————————
WATER FOG. CHEMICAL FOAM. DRY CHEMICAL POWDER. CARBON DIOXIDE.

SPECIAL FIRE FIGHTING INSTRUCTIONS—
WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIRE FIGHTING IN CONFINED SPACE.

*** SECTION 5 - HEALTH HAZARD INFORMATION ***

EXPOSURE LIMITS———————— SUN RECOMMENDATION
8HR. TIME WEIGHTED PERMISSIBLE EXPOSURE 100 PPM MG/M3
SHORT TERM EXPOSURE LIMIT: 015 MINUTES 150 PPM MG/M3

*** ROUTES OF EXPOSURE AND EFFECTS ***

INHALATION ————————————
EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE, THROAT. DIZZINESS, LOSS OF BALANCE AND COORDINATION; UNCONSCIOUSNESS, COMA; RESPIRATORY FAILURE AND DEATH. MATERIAL HAS CAUSED CANCER IN ANIMAL STUDIES, THE SIGNIFICANCE TO HUMAN HEALTH IS UNDER STUDY.

SKIN ————————————
MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT.

EYE ————————————
CONTACT WITH THE EYE MAY CAUSE TEMPORARY SMARTING.

INGESTION ————————————
HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD IF SWALLOWED AND VOMITING OCCURS.

*** FIRST AID ***

INHALATION ————————————
MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.

SKIN ————————————
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. WASH CLOTHING BEFORE REUSE.

EYE ————————————
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL ASSISTANCE.

INGESTION ————————————
DO NOT INDUCE VOMITING] DO NOT GIVE LIQUIDS] OBTAIN MEDICAL ASSISTANCE. SMALL AMOUNTS WHICH ACCIDENTALLY ENTER MOUTH SHOULD BE RINSED OUT UNTIL TASTE OF IT IS GONE.

*** SECTION 6 - REACTIVITY DATA ***

STABILITY————————————
STABLE.

M S D S

Canadian Centre for Occupational Health and Safety

*** IDENTIFICATION ***

RECORD NUMBER : 204232
LANGUAGE : ENGLISH
PRODUCT NAME(S) : GASOLINE REGULAR LEADED
PRODUCT IDENTIFICATION DATA : PRODUCT CODE: C00000107004
DATE OF MSDS : 1988-10-06

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Sunoco Incorporated
ADDRESS : 36 York Mills Road
North York Ontario
Canada M5P 2C5
Telephone: 519-337-2301
EMERGENCY TELEPHONE NO.(S) : 519-337-2301 (24 hours) Brenda Anderson

*** MATERIAL SAFETY DATA ***

*** SECTION 1 - IDENTIFICATION ***

PRODUCT NAME - GASOLINE REGULAR LEADED

M.S.D.S

DATE: 10/06/88

UN/NA

NUMBER: UN1203
SYNONYMS.....: LEADED REGULAR GASOLINE
CAS REGISTRY NO:
CAS NAME.....: NO CLASSIFICATION - MIXTURE
CHEMICAL-FAMILY: MOTOR FUEL WITH LEAD
INFORMATION:
SUPPLIER...: BRENDA ANDERSON
PHONE.....: 519-337-2301

*** SECTION 2 - INGREDIENTS ***

LIGHT PETROLEUM DISTILLATE CONTAINING LEAD ANTIKNOCK ADDITIVE (0.29 G/L
PB)BENZENE 0.1-2% USE AS A MOTOR FUEL ONLY. DO NOT USE FOR ANY OTHER
PURPOSE. WHMIS CLASSIFICATION: CLASS D DIV 2A; CLASS B DIV 2 UPON
REQUEST.

*** SECTION 3 - PHYSICAL DATA ***

BOILING POINT.....: 100 - 435 (DEG. F) 38 - 225 (DEG. C)

INCOMPATIBLE MATERIALS————
INCOMPATIBLE WITH
STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION————
PRODUCTS: CARBON MONOXIDE AND ASPHYXIANTS
POLYMERIZATION————————
WILL NOT OCCUR.

*** SECTION 7 - SPECIAL PROTECTION INFORMATION ***

VENTILATION ————————
USE ONLY WITH ADEQUATE VENTILATION. VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT.
*** PERSONAL PROTECTIVE EQUIPMENT ***
EYE ————————————
PRODUCT MINIMALLY IRRITATING TO EYES. LOCAL SAFETY POLICY DECISION.
GLOVES ————————————
IMPERVIOUS GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE AVOIDED.
RESPIRATOR ————————————
CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION.
OTHER ————————————
NONE NORMALLY NEEDED.

*** SECTION 8 - DISPOSAL PROCEDURES ***

AQUATIC TOXICITY ————————
NOT DETERMINED.
SPILL, LEAK OR RELEASE————
PREVENT IGNITION; STOP LEAK; VENTILATE AREA. WEAR RESPIRATORY PROTECTION FOR LARGE SPILL, LEAK OR RELEASE.
WASTE DISPOSAL METHOD————
FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS.

*** SECTION 9 - SPECIAL PRECAUTIONS ***

STORAGE AND HANDLING CONDITIONS——
KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER TIGHTLY CLOSED. NFPA CLASS IA STORAGE. AVOID PROLONGED BREATHING OF MIST OR VAPOR. NEVER SIPHON BY MOUTH.

*** SECTION 10 - ADDITIONAL PRECAUTIONS AND LABELS ***

SUN RECOMMENDS PRECAUTIONARY LABELING FOR SERVICE STATION PUMPS; PORTABLE CONTAINERS; AND DRUMS. ADDITIONALLY FOR DRUMS A "HAZARDOUS WHEN EMPTY" PICTORAL LOGO AND DOT FLAMMABLE LIQUID LABEL ARE REQUIRED. SPECIFICS AVAILABLE UPON REQUEST.

MELTING POINT.....: N/A (DEG. F)
(DEG. C)
SPECIFIC GRAVITY....: 0.74 (H2O=1)
PACKING DENSITY.....: N/A (KG/M3)
VAPOR PRESSURE.....: 325 TO 525 (MM HG AT 20C)
VAPOR DENSITY.....: 4 (AIR=1)
SOLUBILITY IN WATER.: NIL (% BY VOL)
PH INFORMATION.....: N/A AT CONC. G/L H2O
% VOLATILES BY VOL..: 100
EVAPORATION RATE....: RAPID&VARIES (ETHYL
ETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE.....: BRONZE COLORED LIQUI
ODOR.....: D. GASOLINE ODOR
ODOR THRESHOLD.....: 15(EST) (PPM)

*** SECTION 4 - FIRE AND EXPLOSION DATA ***

FLASH POINT - 40 CLOSED CUP (DEG. F) -40
(DEG. C)
AUTOIGNITION TEMP. APPROX. 750 (DEG. F) APPROX. 400
(DEG. C)

---NFPA CLASSIFICATION--- ------HAZARD RATING------
HEALTH - 1 0 - LEAST 3 - HIGH
FIRE - 3 1 - SLIGHT 4 - EXTREME
REACTIVITY 0 2 - MODERATE
SPECIFIC HAZARD
---FLAMMABLE LIMITS IN AIR---
LOWER EXPLOSIVE LIMIT (LEL) 1.5 % VOL.
UPPER EXPLOSIVE LIMIT (UEL) 7.6 % VOL.
FIRE AND EXPLOSION HAZARDS ----------
EXTREMELY FLAMMABLE LIQUID (FLASH POINT LESS THAN 20F)
EXTINGUISHING MEDIA ----------
WATER FOG. CHEMICAL FOAM. DRY CHEMICAL POWDER. CARBON
DIOXIDE.
SPECIAL FIRE FIGHTING INSTRUCTIONS----
WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIRE FIGHTING
IN CONFINED
SPACE.

*** SECTION 5 - HEALTH HAZARD INFORMATION ***

EXPOSURE LIMITS---------- SUN RECOMMENDATION
8HR. TIME WEIGHTED PERMISSIBLE EXPOSURE 100 PPM
MG/M3
SHORT TERM EXPOSURE LIMIT: 015 MINUTES 150 PPM
MG/M3
*** ROUTES OF EXPOSURE AND EFFECTS ***
INHALATION ----------
EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE,
THROAT.
DIZZINESS, LOSS OF BALANCE AND COORDINATION;
UNCONSCIOUSNESS, COMA;
RESPIRATORY FAILURE AND DEATH. MATERIAL HAS CAUSED CANCER

IN ANIMAL
STUDIES, THE SIGNIFICANCE TO HUMAN HEALTH IS UNDER STUDY.
SKIN ----------
PRACTICALLY NON-TOXIC IF ABSORBED (LD50 GREATER THAN 2000 MG/KG).
MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT.
EYE ----------
CONTACT WITH THE EYE MAY CAUSE TEMPORARY SMARTING.
INGESTION ----------
HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD IF SWALLOWED
AND VOMITING OCCURS.
*** FIRST AID ***
INHALATION ----------
MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.
SKIN ----------
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. WASH CLOTHING BEFORE
REUSE.
EYE ----------
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS,
OBTAIN MEDICAL ASSISTANCE.
INGESTION ----------
DO NOT INDUCE VOMITING] DO NOT GIVE LIQUIDS] OBTAIN MEDICAL ASSISTANCE.
SMALL AMOUNTS WHICH ACCIDENTALLY ENTER MOUTH SHOULD BE RINSED OUT UNTIL
TASTE OF IT IS GONE.

*** SECTION 6 - REACTIVITY DATA ***

STABILITY----------
STABLE.
INCOMPATIBLE MATERIALS----------
INCOMPATIBLE WITH STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION----------
PRODUCTS: CARBON MONOXIDE, ASPHYXIANTS, AND LEAD OXIDES.
POLYMERIZATION----------
WILL NOT OCCUR.

*** SECTION 7 - SPECIAL PROTECTION INFORMATION ***

VENTILATION ----------
USE ONLY WITH ADEQUATE VENTILATION. VENTILATE AS NEEDED TO COMPLY WITH
EXPOSURE LIMIT.
*** PERSONAL PROTECTIVE EQUIPMENT ***
EYE ----------
PRODUCT MINIMALLY IRRITATING TO EYES. LOCAL SAFETY POLICY DECISION.
GLOVES ----------

IMPERVIOUS GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE
AVOIDED.

RESPIRATOR ----------

CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH
CERTIFIED RESPIRATORY PROTECTION.

OTHER ----------

NONE NORMALLY NEEDED.

*** SECTION 8 - DISPOSAL PROCEDURES ***

AQUATIC TOXICITY ----------

NOT DETERMINED.

SPILL, LEAK OR RELEASE----------

PREVENT IGNITION; STOP LEAK; VENTILATE AREA. WEAR RESPIRATORY
PROTECTION FOR LARGE SPILL, LEAK OR RELEASE.

WASTE DISPOSAL METHOD----------

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS.

*** SECTION 9 - SPECIAL PRECAUTIONS ***

STORAGE AND HANDLING CONDITIONS------

KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER TIGHTLY CLOSED.
NFPA CLASS IA STORAGE. AVOID PROLONGED BREATHING OF MIST OR VAPOR.
NEVER SIPHON BY MOUTH.

*** SECTION 10 - ADDITIONAL PRECAUTIONS AND LABELS ***

SUN RECOMMENDS PRECAUTIONARY LABELING FOR SERVICE STATION PUMPS;
PORTABLE CONTAINERS; AND DRUMS. ADDITIONALLY FOR DRUMS A "HAZARDOUS
WHEN EMPTY" PICTORAL LOGO AND DOT FLAMMABLE LIQUID LABEL ARE REQUIRED.
SPECIFICS AVAILABLE UPON REQUEST.

M S D S

Canadian Centre for Occupational Health and Safety

*** IDENTIFICATION ***

RECORD NUMBER : 6153
LANGUAGE : ENGLISH
PRODUCT NAME(S) : METHANOL, METHYL ALCOHOL

*** MANUFACTURER INFORMATION ***

MANUFACTURER : OCELOT AMMONIA CO
ADDRESS : SUITE 1000
1055 WEST HASTINGS STREET
VANCOUVER BRITISH COLUMBIA
CANADA V6E 2E9
Telephone: 604-684-7500

*** MATERIAL SAFETY DATA ***

PRODUCT TRADE NAME(S): METHANOL, METHYL ALCOHOL

PRODUCT DESCRIPTION: A CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC ALCOHOL ODOR WHICH IS DETECTABLE AT 50-100 PPM AND ABOVE IN AIR
CHEMICAL FAMILY: ALCOHOLS

INGREDIENTS

METHYL ALCOHOL CA. 100% (SKIN) OR 260 MG/M3 TLV: 200 PPM

CURRENT OSHA TLV: ACGIH (1977) TLV ADDS (SKIN) NOTATION WHICH INDICATES A POTENTIAL CONTRIBUTION TO OVERALL EXPOSURE VIA ABSORPTION THROUGH THE SKIN. NIOSH HAS RECOMMENDED A 10-HR TWA OF 200 PPM WITH A CEILING OF 800 PPM (15 MINUTE SAMPLE). HUMAN, ORAL LDLO 340 MG/KG.

PHYSICAL PROPERTIES OF PRODUCT

SOLUBILITY (%): COMPLETE
BOILING POINT OF PRODUCT: 148 DEG F
VAPOUR PRESSURE OF PRODUCT: 100 MMHG @ 70 DEG F
VAPOUR DENSITY OF PRODUCT: 1.1 (AIR = 1)
SPECIFIC GRAVITY OF PRODUCT: 0.7928 (68 DEG F/68 DEG F)
PERCENT VOLATILE (%): 100

EVAPORATION RATE: 1 (CCL/4 = 1)
FLASH POINT OF PRODUCT: 52 DEG F (11 DEG C) CLOSED CUP
LOWER EXPLOSIVE LIMIT: 6
UPPER EXPLOSIVE LIMIT: 36.5
MOLECULAR WEIGHT: 32.04
AUTO-IGNITION TEMP: 867 DEG F (465 DEG C)

FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA: CO2, DRY CHEMICAL, ALCOHOL FOAM, AND WATER MIST OR FOG. ALCOHOL FIRES ARE CLASS B FIRES, USE A BLANKETING EFFECT TO SMOTHER FIRE.
SPECIAL FIRE FIGHTING PROCEDURES: FIREFIGHTERS SHOULD USE SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE AND FULL PROTECTIVE CLOTHING WHERE THIS MATERIAL IS INVOLVED IN A FIRE IN AN ENCLOSED PLACE
UNUSUAL FIRE/EXPLOS HAZARDS: IT IS A MODERATE EXPLOSION HAZARD AND DANGEROUS FIRE HAZARD WHEN EXPOSED TO HEAT, SPARKS OR FLAMES AND CAN REACT VIGOROUSLY WITH OXIDIZING AGENTS

HEALTH HAZARD DATA

TLV'S: 200 PPM (SKIN) OR 260 MG/M3
METHANOL IS A POISONOUS, NARCOTIC CHEMICAL THAT MAY EXERT ITS EFFECTS THROUGH INHALATION, SKIN ABSORPTION OR INGESTION. BODY ELIMINATION OF METHANOL IS SLOW, AND THE TOXIC EFFECTS CAN BE COMPOUNDED BY REPEATED EXCESSIVE EXPOSURES OVER SEVERAL DAYS. TOXIC EFFECTS ARE EXERTED UPON THE NERVOUS SYSTEM, ESPECIALLY THE OPTIC NERVE. INGESTION CAN PRODUCED BLINDNESS. SYMPTOMS OF OVEREXPOSURE INCLUDE DIZZINESS, BLURRING OF VISION, NAUSEA, CARDIAC DEPRESSION, MUSCULAR INCOORDINATION AND NARCOSIS. SOLVENT ACTION CAN DRY THE SKIN AND CAUSE DERMATITIS.

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: IRRIGATE WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL HELP.
SKIN CONTACT: WASH AFFECTED AREA WITH SOAP AND WATER; APPLY SKIN LOTIONS.
INHALATION: REMOVE VICTIM TO FRESH AIR AND PREVENT FURTHER EXPOSURE FOR 7 DAYS. OBTAIN MEDICAL ASSISTANCE IF VICTIM IS NOT FULLY NORMAL WITHIN 10 MINUTES.
INGESTION: REFER TO MEDICAL AID; IF PATIENT IS CONSCIOUS GIVE 8 OZ. OF JUICE OR WATER, INDUCE VOMITING, ADMINISTER 1 TSP. OF BAKING SODA IN A GLASS OF WATER

REACTIVITY DATA

METHYL ALCOHOL IS A FLAMMABLE MATERIAL, BUT IS STABLE UNDER NORMAL STORAGE AND USE CONDITIONS. IT DOES NOT UNDERGO HAZARDOUS POLYMERIZATION. AVOID CONTACT WITH STRONG OXIDIZING AGENTS SUCH AS NITRATES, PERCHLORATES OR SULFURIC ACID. OXIDATION PRODUCTS IN AIR INCLUDE OXIDES OF CARBON AND NITROGEN.

SPILL OR LEAK PROCEDURES

CLEANUP: NOTIFY SAFETY PERSONNEL. REMOVE ALL SOURCES OF IGNITION; PROVIDE ADEQUATE VENTILATION. ABSORB ON VERMICULITE, PAPER OR OTHER ABSORBENT. SPILLS IN SENSITIVE AREAS MAY BE DILUTED AND FLUSHED TO GROUND WITH A WATER SPRAY. DO NOT FLUSH TO SEWER. FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS.
DISPOSAL: DISPOSE OF LARGE QUANTITIES OF WASTE VIA A LICENSED WASTE SOLVENT

DISPOSAL COMPANY, OR RECLAIM VIA FILTRATION AND DISTILLATION PROCEDURES. IT CAN BE INCINERATED. BURN IN AN APPROVED INCINERATOR OR OPEN PIT AWAY FROM BUILDINGS AND PEOPLE.

PERSONAL PROTECTION

PROVIDE ADEQUATE VENTILATION TO MEET TLV REQUIREMENTS. EXHAUST VENTILATION WITH 100 LFM MINIMUM SHOULD BE USED WHERE VAPOR EXPOSURE IS LIKELY. PREVENT SKIN CONTACT BY WEARING RUBBER GLOVES. PROTECTIVE APRONS, BOOTS AND FACE SHIELDS SHOULD BE USED WHERE SPLASHING MAY OCCUR. USE SAFETY GLASSES IN OTHER AREAS OF USE. REMOVE METHANOL CONTAMINATED CLOTHING PROMPTLY. EYE WASH STATIONS AND SAFETY SHOWERS SHOULD BE AVAILABLE IN AREAS OF USE. EXHAUST FANS SHOULD BE EXPLOSION PROOF. NO SMOKING IN AREAS OF USE. RESPIRATOR PROTECTION FOR EMERGENCY: USE AIR-SUPPLIED OR SELF-CONTAINED RESPIRATORS ABOVE TLV. A FULL FACEPIECE IS REQUIRED ABOVE 2000 PPM.

STORAGE AND HANDLING

STORAGE AND HANDLING: PREVENT SKIN CONTACT. DO NOT BREATH VAPORS. THIS MATERIAL IS POISONOUS WHEN INTRODUCED INTO THE BODY METABOLISM. DO NOT INGEST. STORE IN A WELL-VENTILATED, FIRE-PROOF AREA. GROUND AND ELECTRICALLY INTERCONNECT CONTAINERS FOR TRANSFER. USE SPARK-PROOF TOOLS. KEEP AWAY FROM HEAT AND IGNITION SOURCES. NO SMOKING IN AREAS OF STORAGE OR USE.

ADDITIONAL INFORMATION

NIOSH RECOMMENDS PREPLACEMENT MEDICAL EXAMS FOR INDUSTRIALLY EXPOSED WORKERS, PERIODIC MEDICAL SURVEILLANCE, AND PROMPT EYE EXAMINATIONS FOR EYE CONTACT WITH METHANOL OR FOR ANY OVEREXPOSURE.

MATERIAL SAFETY DATA SHEET

MSDS Number: EXV 901
Revision: 0
Date: November 1990
Telephone For Information And Emergency Response:

SOLICO COMPANY
5119 Edith Blvd
Albuquerque, NM
(505) 345-1633

SECTION I - PRODUCT IDENTIFICATION

Trade names and Synonyms: Solico brand vermiculite, Micalite

Chemical Name and Family: Exfoliated (expanded) vermiculite, Magnesium-Aluminosilicate Mineral

Chemical Formula: $(Mg,Ca,K,Fe^{II})_3\ (Si,Al,Fe^{III})_4\ O_{10}\ (OH)_2\ 4(H_2O)$

CAS# (Chemical Abstract Service): 01318-00-9

Transportation Classifications

Surface Freight Classification: Vermiculite, Other Than Crude

USA DOT CLASS: Nonhazardous
USA DOT ID#: Not Applicable
USA DOT LABEL: Not Applicable

CANADA Transportation of Dangerous Goods TDG CLASS: Nonhazardous

NPCA-HMIS Hazard Index

Health: 1 Flammability: 0 Reactivity: 0 Personal Protection: E

SECTION II- HAZARDOUS INGREDIENTS/IDENTY INFORMATION

Ingredient, (CAS#, Chemical & Common Names):	Total Dust	Respirable Dust
Percent by Weight:	Not Applicable	NOT Applicable
Exposure Limits, OSHA:	15mg/m^3	5mg/m^3
Exposure limits, ACGIH:	10mg/m^3	5mg/m^3

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: Not Applicable
Specific Gravity: Not Applicable
Vapor Pressure: Not Applicable
Volatiles (%): Not Applicable
Vapor Density: Not Applicable
Evaporation Rate: Not Applicable
Bulk Density (lb/cuft): 4 to 9
Solubility in Water: None
pH Value (in water): 6 to 8
Odour Threshold: Unknown

Appearance and Odour: Brown to golden brown flakes. No odour.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: None Flammable Limits: None LEL: None UEL: None

Extinguishing Media: None Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

SECTION V - REACTIVITY DATA

Stability: Stable Stability Conditions to Avoid: None known

Incompatability, Materials to Avoid: Strong halogenated oxidizers

Hazardous Decomposition or Byproducts: Not Applicable

Hazardous Polymerization: Will not occur

Polymerization Conditions to Avoid: Not Applicable

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY	TOXICOLOGICAL PROPERTIES
Inhalation:	Vermiculite dust released in handling or mixing may cause symptoms typical of nuisance dust including coughing, sneezing, and minor respiratory irritation.
Skin and Eye:	Direct eye contact may cause minor physical or mechanical irritation. Skin contact has no known harmful effects.
Ingestion:	Adverse health effects from injestion are not expected.

Carcinogenicity According to NTP, IARC, and OSHA: Not Applicable

Medical Conditions Generally Agrivated by Exposure: None Known

Emergency and First Aid Procedures: If inhaled, get fresh air. If symptoms persist, consult a physician. In case of eye contact, flush with eye wash or water. If irritation, blinking, or tearing persist, consult a physician.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material is Released or Spilled: Clean up spills with normal house cleaning methods and implements.

Waste Disposal and Handling & Storage Special Precautions: None.

SECTION VIII - CONTROL MEASURES

Respriatory Protection: Wear dust mask, NIOSH, Type TC-21C-XXX.

Ventilation: Local exhaust recommended to reduce dust levels.

Protective Gloves: Not required Eye Protection: Goggles optional

Other Protective Clothing: Normal work clothes

Work/Hygenic Practices: Observe the precautions noted above.

Supplimental Information: Expanded vermiculite is processed from ore concentrate. The ore bodies contain other naturally occuring minerals in addition to vermiculite. These include tremolite and actinolite. Both of these minerals occur in two forms: Fibrous, which is assbestiform, and Massive, which is non-asbestosform. The ore which we process has been extensively tested by qualified environmental service and test groups. In all cases they report that there are "No Detectable Levels of Asbestos Present".

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List): ALCONOX

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name: ALCONOX, INC.	Emergency Telephone Number: (212) 473-1300
Address (Number, Street, City, State, and ZIP Code): 215 PARK AVENUE SOUTH NEW YORK, N.Y. 10003	Telephone Number for Information: (212) 473-1300 Date Prepared: JANUARY 1, 1991 Signature of Preparer (optional):

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
THERE ARE NO INGREDIENTS IN ALCONOX WHICH APPEARED ON THE OSEA STANDARD 29 CFR 1910 SUBPART Z.				

Section III — Physical/Chemical Characteristics

Boiling Point	N.A.	Specific Gravity (H_2O = 1)	N.A.
Vapor Pressure (mm Hg.)	N.A.	Melting Point	N.A.
Vapor Density (AIR = 1)	N.A.	Evaporation Rate (Butyl Acetate = 1)	N.A.

Solubility in Water: APPRECIABLE (GREATER THAN 10 PER CENT)

Appearance and Odor: WHITE POWDER INTERSPERED WITH CREAM COLORED FLAKES - ODORLESS

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used): NONE	Flammable Limits	LEL: N.A.	UEL: N.A.

Extinguishing Media: WATER, CO_2, DRY CHEMICAL, FOAM, SAND/EARTH

Special Fire Fighting Procedures: FOR FIRES INVOLVING THIS MATERIAL DO NOT ENTER WITHOUT PROTECTIVE EQUIPMENT AND SELF CONTAINED BREATHING APPARATUS

Unusual Fire and Explosion Hazards: NONE

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid: NONE
	Stable	XX	

Incompatibility (Materials to Avoid): AVOID STRONG ACIDS

Hazardous Decomposition or Byproducts: MAY RELEASE CO_2 GAS ON BURNING

Hazardous Polymerization	May Occur		Conditions to Avoid: NONE
	Will Not Occur	XX	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES Skin? NO Ingestion? YES

Health Hazards (Acute and Chronic): INHALATION OF POWDER MAY PROVE LOCALLY IRRITATING TO MUCOUS MEMBRANES. INGESTION MAY CAUSE DISCOMFORT AND/OR DIARRHEA.

Carcinogenicity: NTP? NO IARC Monographs? NO OSHA Regulated? NO

Signs and Symptoms of Exposure: EXPOSURE MAY IRRITATE MUCOUS MEMBRANES. MAY CAUSE SNEEZING.

Medical Conditions Generally Aggravated by Exposure: RESPIRATORY CONDITIONS MAY BE AGGRAVATED BY POWDER

Emergency and First Aid Procedures: EYES-FLUSH WITH PLENTY OF WATER FOR 15 MINUTES SKIN-FLUSH WITH PLENTY OF WATER INGESTION-DRINK LARGE QUANTITIES OF WATER, GET MEDICAL ATTENTION FOR DISCOMFORT

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: MATERIAL FOAMS PROFUSELY. SHOVEL AND RECOVER AS MUCH AS POSSIBLE. RINSE REMAINDER TO SEWER. MATERIAL IS COMPLETELY BIODEGRADABLE.

Waste Disposal Method: SMALL QUANTITIES MAY BE DISPOSED OF IN SEWER. LARGE QUANTITIES SHOULD BE DISPOSED OF ACCORDING TO LOCAL REQUIREMENTS FOR NON-HAZARDOUS DETERGENT.

Precautions to Be Taken in Handling and Storing: STORE IN A DRY AREA TO PREVENT CAKING.

Other Precautions: NO SPECIAL REQUIREMENTS OTHER THAN THE GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.

Section VIII — Control Measures

Respiratory Protection (Specify Type): DUST MASK

Ventilation	Local Exhaust: NORMAL	Special: N.A.	
	Mechanical (General): N.A.	Other: N.A.	

Protective Gloves: USEFUL-NOT REQUIRED Eye Protection: USEFUL-NOT REQUIRED

Other Protective Clothing or Equipment: NOT REQUIRED

Work/Hygienic Practices: NO SPECIAL PRACTICES REQUIRED

• U.S.G.P.O. 1986-491-529/45775