

**Site Health and Safety Plan for the
Helicopter Hangar Area, Fire Training Area, and
Ordnance Demolition Area
at Fort George G. Meade, Maryland**

**Prepared for:
U.S. Army Environmental Center
Aberdeen, Maryland**

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PLAN APPROVAL

**FORT GEORGE G. MEADE
FIRE TRAINING AREA
SITE HEALTH AND SAFETY PLAN**

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List of Acronyms and Abbreviations

ANSI	American National Standards Institute
CFR	Code of Federal Regulations
CHSD	Corporate Health and Safety Director
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
CWP	Comprehensive Work Plan
dBA	Decibels on the A-weighted scale
EPA	Environmental Protection Agency
EOD	Explosive Ordnance Disposal
EMS	Emergency Medical Services
EZ	Exclusion Zone
FGGM	Fort George G. Meade
FID	Flame Ionization Detector
FS	Feasibility Study
FTA	Fire Training Area
GC	Gas Chromatograph
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHA	Helicopter Hangar Area
HASP	Health and Safety Plan
IDW	Investigation Derived Waste
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute of Occupational Safety and Health
ODA	Ordnance Demolition Area
ORS	Occurrence Reporting System
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA	Quality Assurance
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SDTM	Site Deputy Task Manager
SHSM	Site Health and Safety Manager
SHSO	Site Health and Safety Officer
SOP	Standard Operating Procedure
SPM	Site Project Manager
STM	Site Task Manager
SWP	Safety Work Permit
UL	Underwriters' Laboratory
USAEC	United States Army Environmental Center
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds
WBG	Wet Bulb Globe Thermometer

EXECUTIVE SUMMARY

The U.S. Army Environmental Center (USAEC) policy is to provide a safe and healthful workplace for all employees and subcontractors. The accomplishment of this policy requires that operations at the Fort George G. Meade Fire Training Area (FTA), Helicopter Hangar Area (HHA), and Ordnance Demolition Area have an overall plan and consistent proactive approach to health and safety issues.

The policy and procedures in this plan apply to all areas of the HHA, FTA and ODA. The provisions of this plan are to be carried out whenever activities are initiated at the HHA, FTA and ODA that could be a threat to human health or the environment. This plan implements a policy and establishes criteria for the development of procedures for day-to-day operations to prevent or minimize any adverse impact to the environment and personnel safety and health and to meet standards which define acceptable management of hazardous and radioactive materials and wastes. The plan is written to utilize past experience and best management practices to minimize hazards to human health or the environment from events such as fires, explosions, or any unplanned release of hazardous or radioactive waste to air, soil, or surface water.

This plan shall be available for on-site inspection and review by all subcontractors and USAEC personnel and shall be easily accessible in the field for on-site personnel. During on-site activities, all personnel, including subcontractors and visitors, are expected to comply fully with the requirements of this plan and other Analysas Corporation and USAEC policies and procedures. Site activities shall be performed in accordance with all applicable Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910 and 1926, and applicable Environmental Protection Agency (EPA) requirements and consensus standards.

It is understood that it may not be possible to determine actual working conditions in advance of the work. Therefore, the plan must allow the opportunity to provide a range of protection based upon actual working conditions that could be encountered while conducting on-site activities.

1.0 INTRODUCTION

The following site- and task- specific Health and Safety Plan (HASP) is prepared to address health and safety issues related to conducting the Remedial Investigation/Feasibility Study (RI/FS) at the Fire Training Area (FTA), Helicopter Hangar Area (HHA), and the Ordnance Demolition Area (ODA) at Fort Meade, Maryland. This plan follows the format recommended by the U.S. Environmental Protection Agency (EPA) for RI/FS and complies with the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR 1910.120 for investigations at hazardous waste sites.

1.1 HASP Components

This HASP provides information on the following topics:

- Key health and safety personnel.
- Risk analysis (site hazards).
- Worker training.
- Personal protective equipment (PPE).
- Medical surveillance requirements.
- Frequency and types of monitoring.
- Site control measures.
- Decontamination procedures.
- Standard Operating Procedures (SOPs) for the site.
- Contingency plans.

This HASP provides information applicable to the activities of conducting a RI/FS. All HASPs will be reviewed and approved by Analysas Corporation and USAEC personnel to ensure that the plans comply with USAEC policies and procedures.

1.2 SITE DESCRIPTION

Fort George G. Meade (FGGM) is located in Anne Arundel County, Maryland, between Washington, D.C., and Baltimore, Maryland (Figure 1-1). The closest town is Laurel, Maryland, which is located less than five miles to the west.

The base has been a permanent U.S. Army installation since 1917. The installation contains administration, recreational, and housing facilities, as well as limited training areas and firing/combat ranges. The FGGM community consists of a residential population and daytime work force of approximately 20,000.

Based on a review of available information about Fort Meade, including a review of previous investigations, historical and current practices at Fort Meade's HHA, FTA and ODA, that may pose a threat to human health and the environment are:

- Waste petroleum, oil, solvents, and other lubricant products; pesticides; heavy metals; polynuclear aromatic hydrocarbons; PCBs and potentially other types of hazardous wastes may be encountered.

- Unexploded ordnance (UXO) on the surface and beneath the training and range areas poses a potential threat to health and safety because of the risk of explosions. Additionally, ordnance detonated in demolition areas may release contaminants to soils and groundwater.
- Blister agents may be encountered when conducting soils contact work, including drilling and handling auger flights.

The location of the HHA, FTA and ODA are shown on the Fort George G. Meade site map. (See Figure 1-2) The site map for the HHA is shown in Figure 1-3, the site map for the FTA is shown in Figure 1-4, and the site map for the ODA is shown in Figure 1-5.

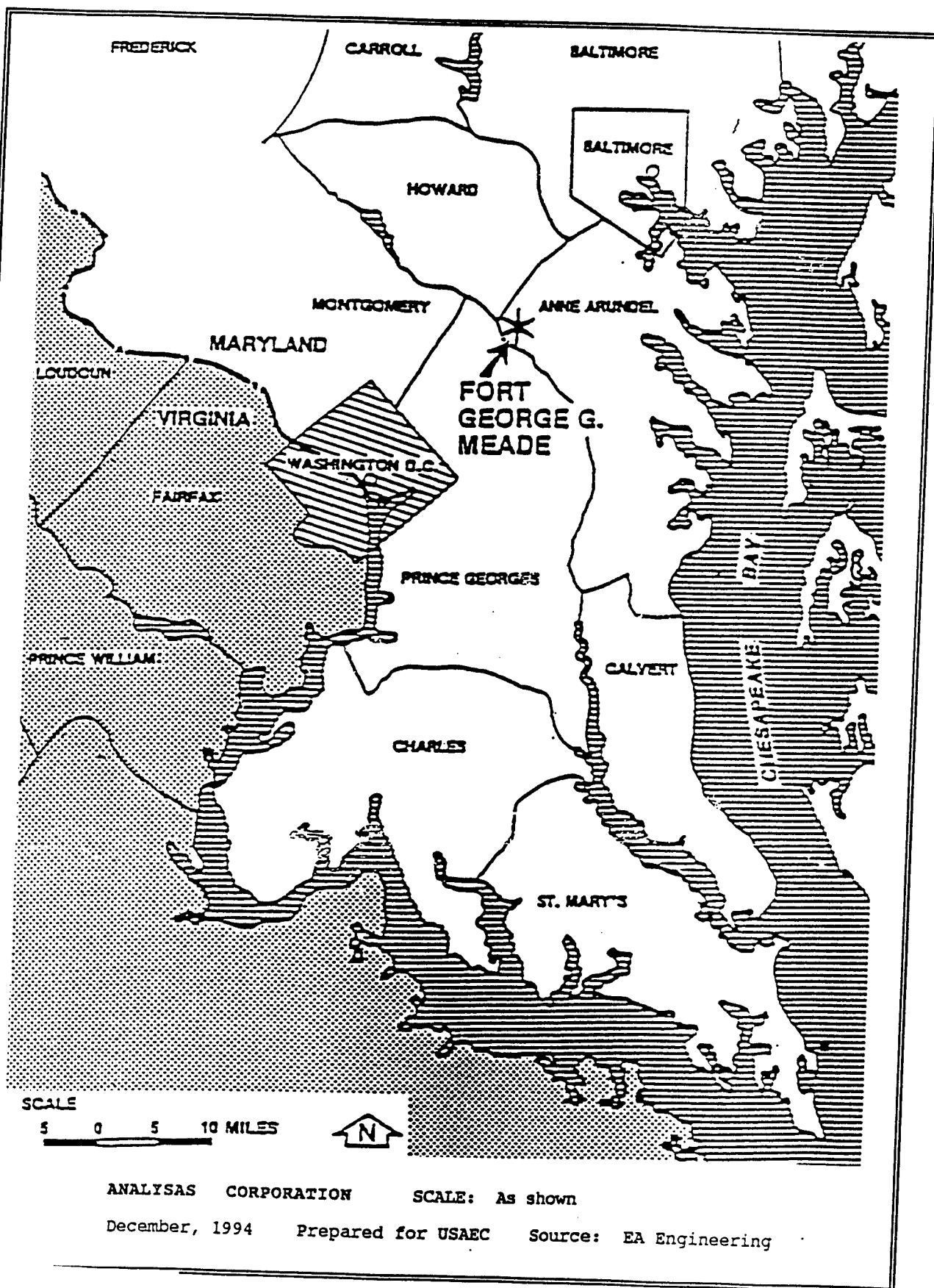
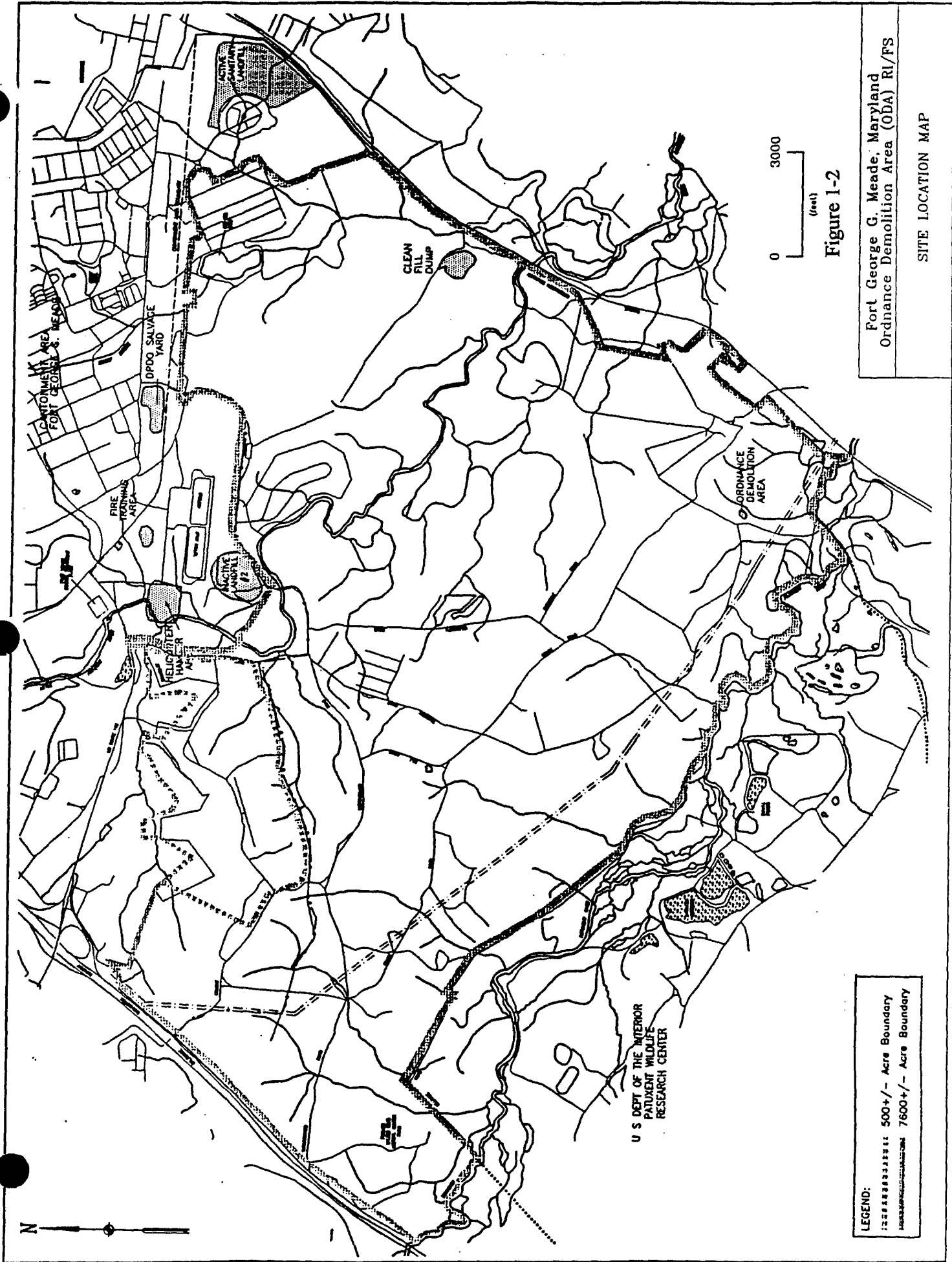


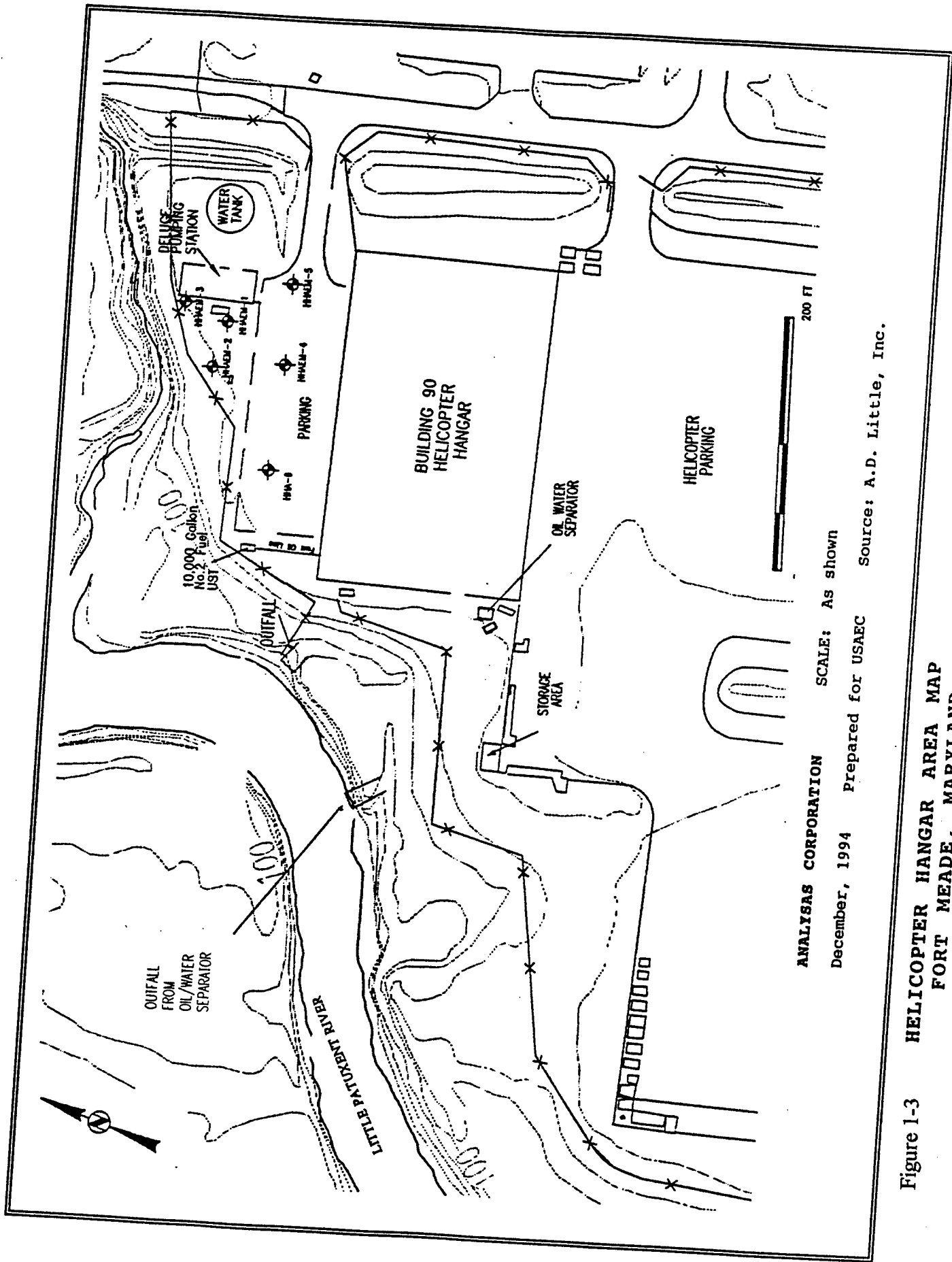
Figure 1-1 FORT MEADE LOCATION MAP, MARYLAND



Fort George G. Meade, Maryland
Ordnance Demolition Area (ODA) RI/FS

SITE LOCATION MAP

LEGEND:
500+/- Acre Boundary
7500+/- Acre Boundary



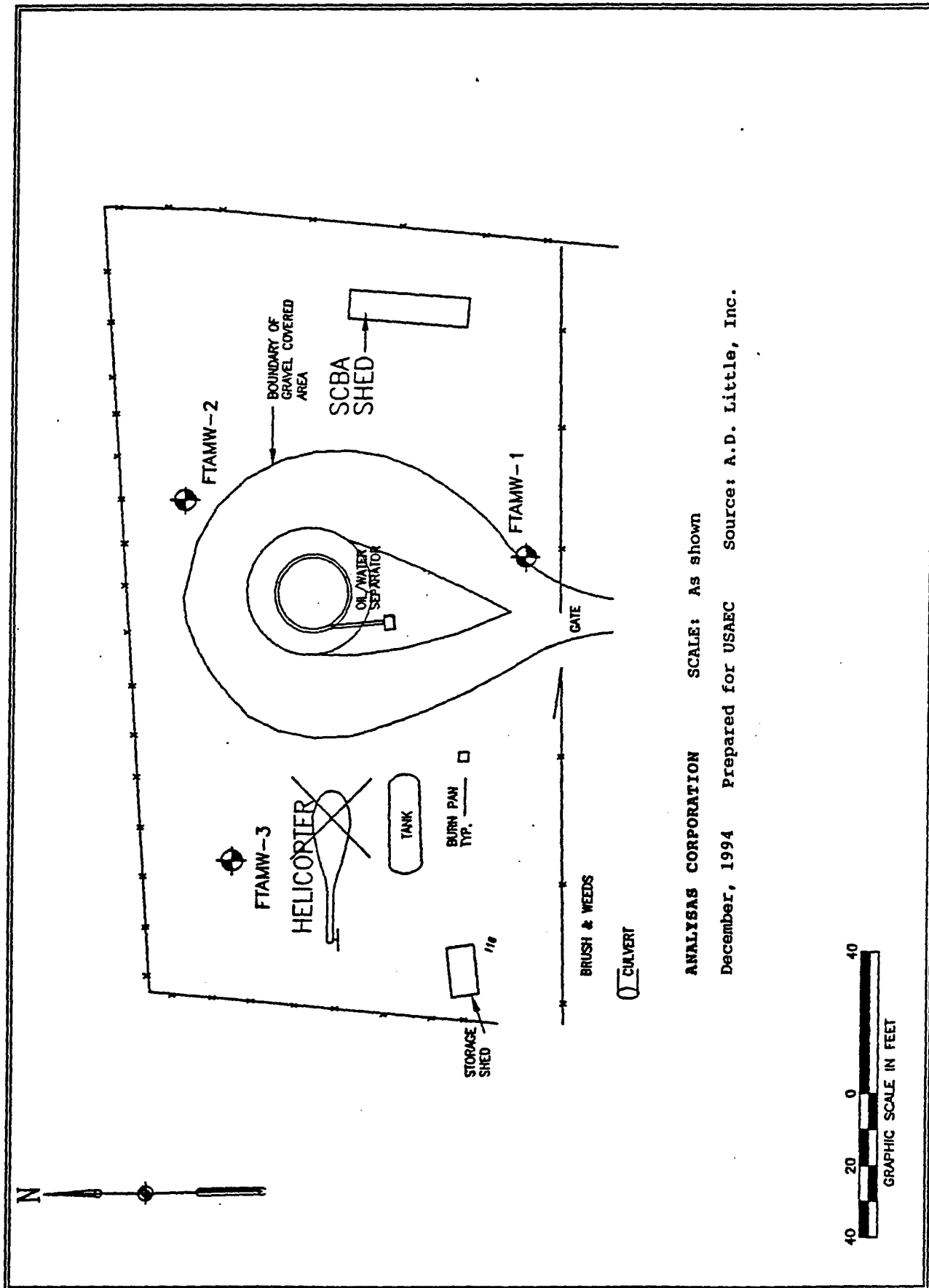


Figure 1-4 FIRE TRAINING AREA MAP
FORT MEADE, MARYLAND

N

Wildlife Loop

Earthen Berm

Ordinance
Demolition
Pit

Shed

ODAMW-3

ODAMW-2

ODAMW-1



Figure 1-5

Fort George G. Meade, Maryland
Ordinance Demolition Area RI/FS

Ordinance Demolition Area Map

ODAMW-1
EXISTING MONITORING WELLS

2.0 COMPREHENSIVE WORK PLAN

A comprehensive work plan (CWP) is developed and written for each work project conducted during the RI/FS at Fort George G. Meade in accordance with the requirements of 29 CFR 1910.120. A review of the CWP shall be conducted by all members or representatives of the review committee for this HASP. The CWPs shall be written and executed in accordance with this HASP. Each CWP shall contain a scope of work which describes all anticipated tasks which will be conducted during the work project and that summarized the tasks required to perform each operation safely.

The tasks addressed in this HASP are associated with RI/FS activities being conducted at the FTA and the HHA to evaluate the nature and extent of contamination. These activities include:

- Install monitoring wells, obtain groundwater level measurements, and perform aquifer tests.
- Conduct field investigations for volatile organic compounds.
- Collect groundwater, surface water, sediment and soil samples.
- Collect trip, field and rinsate blanks, and 10% field duplicates for quality control.
- Manage investigation derived waste, such as soil cuttings, drilling mud, drilling water, well development water, well purging water, decontamination water, and any other waste generated by the RI/FS activities.
- Conduct a job site screening for unexploded ordnance for all intrusive activities.

2.1 Project Documentation

2.1.1 Site Logbook

A site logbook shall be dedicated to each project for the purpose of documenting and summarizing all pertinent site activities, work efforts, and daily events. Observations to be recorded in the site logbook shall include, but are not limited to, the following: site conditions, site operations, instrumentation monitoring and calibration information, site entrants, accidents or injuries, and attendance at pre-entry and periodic health and safety briefings. Site personnel may view the contents of the site logbook or document their account of any event in the logbook. The Site Health and Safety Officer (SHSO) is responsible for maintaining the project site logbook as a record of site activities and project events. Additional permits and forms may be required during site activities as documentation of project activities. Required project documentation may include, but is not limited to, the following:

- Site Health and Safety Plan.
- Site Health and Safety Plan Acceptance forms signed by each site worker.
- Project Logbook.
- Site instrumentation monitoring and calibration logs.
- Safety Work Permits (SWPs).
- Accident and illness reports.
- Inspection reports.
- Worker medical records.
- Worker training records.

These items shall be considered a part of the project documentation and shall be maintained on-site by the SHSO for the duration of the project. Upon completion of the project, all documentation will be maintained with the site project logbook as a part of the project's historical records.

2.1.2 Corrective Actions

Corrective actions are those measures taken to rectify any occurrence that fails to follow criteria specified in this HASP. Corrective action may be initiated by any person performing work or involved in support of the project at any time.

2.1.2.1 Field Activities

The majority of corrective actions will be of short duration. Examples include documentation errors or failure to date and sign a field monitoring form. Corrective actions will be initiated by bringing the discrepancy to the attention of the appropriate personnel. Corrections will be accomplished at the time of the disclosure under supervision of the Corporate Health and Safety Director. Any discrepancies of health and safety protocol, such as the use of ineffective PPE, entering the Support Zone from the Contamination Reduction Zone (CRZ) without completing the decontamination, or failure to calibrate instruments prior to use, will also be considered short-term events. Work shall be suspended until the corrective action is performed under the supervision of the SHSO or Site Health and Safety Manager (SHSM).

2.1.2.2 Occurrence Reporting

The occurrence reporting system (ORS) may be initiated any time an employee, contractor, or subcontractor reports problems, concerns, conditions, or events that could adversely affect safety, the environment, health, quality, security, or site operations. Any occurrence is to be reported to the SHSO. If the event involves a real-time occurrence that requires assistance from the base emergency services, on-site personnel should first take actions to mitigate the occurrence and the situation should be reported. Any other USAEC procedures for occurrence reporting should also be followed.

2.1.2.3 Field Changes and Variances

Any deviation from the HASP or the CWP, or change in established work procedures must be reported and recorded in the field logbook for field changes and variances, when the deviation occurs. The record should be signed by the SHSO to document the deviation from the HASP or the CWP.

A variance is a routine change in any aspect of the written procedure that would not affect the quality of data or analytical results. A field change is a deviation that could adversely affect the quality of data being generated. A copy of the record for a field variance or change will be distributed to the project quality assurance (QA) representatives.

All personnel involved in the work process will be informed of these changes. All field personnel will be explained of how data quality will be affected.

3.0 SITE ORGANIZATION

USAEC subcontracts some site management activities such as engineering support, construction, technical support, and monitoring to other firms and organizations. All subcontractors and their anticipated services for each work project must be specified in the CWP. Therefore, both the roles and responsibilities for site operations may change as different organizations are subcontracted to perform services during various work projects conducted at the HHA, FTA and ODA.

3.1 Key Personnel

Table 3.1 represents the organizational structure for the HHA, FTA and ODA project. A brief description of the responsibilities of the key staff is found. Additional project roles which may be required will be dictated by anticipated work project site operations. The identity of the person or organization fulfilling the role and a contact number for each person or organization must also be specified.

Table 3.1 Site Roles

SITE ROLES
USAEC Technical Contact - Mr. Scott Hill
USAEC Safety and Environmental Services Contact - Ms. Vivian Graham
Analysas Corporation Site Program Manager - Mr. Rich Tringale
Analysas Corporation Task Manager - Ms. Alison Doherty
Analysas Corporation Deputy Task Manager - Mr. Peter Mattejat
Analysas Corporation Site Health and Safety Director (CHSD) - Mr. Sid McNair
Analysas Corporation Site Health and Safety Officer (SHSO)
Subcontractor Health and Safety Representative (SHSR)

3.2 Site Roles and Responsibilities

The sections below contain descriptions of anticipated site roles and responsibilities. Site roles and responsibilities are not limited to those listed below. Additional site roles and responsibilities or changes in key personnel shall be added as an addendum to this plan if the roles are permanent for all site activities. The roles and responsibilities of key personnel for each contractor shall also be identified in the HASP.

3.2.1 USAEC Technical Contact

The USAEC Technical Contact is Mr. Scott Hill, who is primarily responsible for the oversight and coordination of all Fort Meade HHA, FTA and ODA operations and activities. The USAEC Safety and Environmental Services contact will be Mrs. Vivian Graham, who can be contacted at (410) 671-4480. The responsibilities of the Technical Contact include, but are not limited to, the following:

- Managing site access for all personnel entering the Fort Meade HHA, FTA and ODA (e.g., USAEC employees, subcontractors, and site visitors).
- Coordinating the identification and control of potential site health and safety hazards.
- Ensuring the communication of health and safety information to HHA, FTA and ODA entrants.
- Assembling and maintaining all HHA, FTA and ODA operations, structures, and facilities.
- Reviewing and approving all site activities, operations, HASPs, and CWP.

3.2.1 Site Program Manager

The Site Program Manager (SPM) is primarily responsible for monitoring technical progress, reviewing and approving all work products, and quality assurance on all deliverables before their submission to USAEC. The SPM will provide oversight, monitor financial and schedule control, and institute any related necessary corrective action. The SPM is designated as the Corporate Sponsor for all technical and administrative issues associated with the performance of this task and will serve as a point of contact for any concerns or recommendations pertaining to the activities being performed by Analysas Corporation or their subcontractors.

3.2.2 Site Task Manager

The Site Task Manager (STM) reports directly to the Site Program Manager. The STM is responsible for project staffing and direct management of all staff assigned to this project; direct financial and schedule control; review and approval of all deliverables; recommending necessary corrective actions to the Program Manager; and continuing liaison with the USAEC Project Officer. The STM is responsible for ensuring that the USAEC Project Officer is kept apprised of technical progress and of any problems that may arise. All subcontractor activities in the performance of this project will be coordinated by the STM.

3.2.3 Site Deputy Task Manager

In the absence of the STM, the Site Deputy Task Manager (SDTM) will serve as the Site Task Manager and maintain awareness of the day-to-day status of the project. The SDTM will report directly to the Site Task Manager. The SDTM will be responsible for all technical coordination of work activities performed at Analysas' Oak Ridge Corporate Office.

3.2.4 Corporate Health and Safety Director

The Corporate Health and Safety Director (CHSD) is responsible for all health and safety aspects of this project, as well as providing health and safety oversight as required. The Site Health and Safety Officer will receive guidance from the CHSD as needed.

3.2.5 Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) shall be a person designated by the CHSD to be able to perform actual on-site health and safety supervision of all site activities, under the direction of the CHSD. The SHSO is required to have fulfilled the training requirements and medical monitoring requirements for exclusion zone access, to have a minimum of 2 years health and safety experience through work activities or education, and to have previously performed or been trained as a supervisor for hazardous waste sites. The responsibilities of the SHSO shall include, but are not limited to the following:

- Coordinating with the SHSR.
- Overseeing the selection, inspection, storage, and maintenance of personal protective clothing and equipment to be used on-site.
- Establishing and maintaining work zones to prevent the potential spread of contamination during work and decontamination activities.
- Controlling entry and exit of all personnel and observers into the zones.
- Participating in the preparation and implementation of the HASP and CWP.
- Conducting periodic inspections to ensure the compliance of all site entrants with health and safety measures outlined in the HASP.
- Confirming each worker's suitability for hazardous waste site work based upon a physician's recommendation and Hazardous Waste Operations and Emergency Response (HAZWOPER) physical, as well as maintaining records to that effect on-site, including documentation of worker participation in the necessary medical surveillance programs and respiratory protection programs.
- Maintaining and inspecting records of each on-site worker's training required for each work effort in accordance with 29 CFR 1910.120.
- Ensuring that all prospective site personnel sign and date the field logbook to verify that the requirements for informing personnel of site-specific potential health hazards and other health and safety information covered in the HASP, as well as medical surveillance and training requirements for individual workers for site access, have been met.
- Performing monitoring of ambient site conditions for potential personnel exposures as well as monitoring of workers for symptoms of exposure or for conditions related to other on-site hazards and conditions including both physical stresses, such as temperature extremes, and psychological stresses.
- Performing daily field calibrations of all environmental monitoring equipment used to detect ambient site conditions and potential personnel exposures as outlined in the

HASP, as well as maintaining documentation of such instrument calibration in the work project logbook.

- Ensuring that all monitoring equipment is operating correctly according to this HASP and the manufacturer's instructions and providing maintenance if authorized.
- Conducting pre-entry and periodic health and safety briefings which include, but are not limited to, subjects such as site hazard communications and information concerning the site emergency action plan and emergency response actions and responsibilities, as well as the locations of fire alarms, extinguishers, telephones, and sanitation facilities.
- Establishing and posting at the site an emergency action plan, telephone numbers, and appropriate radio communication information.

The SHSO has the authority to order a cessation of any site activities that the SHSO perceives to be immediately dangerous to life, to the health of site personnel or the community, or to the environment. The SHSO is also authorized to order the commencement of work activities once the subject of concern has been resolved to the satisfaction of all health and safety personnel consulted.

3.2.6 Subcontractor Health and Safety Representatives (SHSR)

The SHSR is responsible for the health and safety of subcontractor personnel performing tasks onsite to support the RI/FS. The SHSRs will work closely with the SHSO to ensure that subcontractor personnel comply with the requirements stated in this HASP.

3.2.7 Field Personnel

The responsibilities of all field personnel involved in site operations include, but are not limited to, the following:

- Taking all reasonable precautions to prevent injury to themselves and their fellow employees; using *all of their senses* and information collected from field instrumentation to alert them of potentially harmful situations.
- Performing only those tasks that the personnel believe they can do safely, and immediately reporting any accidents and unsafe conditions to the SHSO.
- Notifying the SHSO of any existing medical conditions (e.g., allergies, diabetes, pregnancy) that require special consideration. USAEC approval and/or a physician's recommendation may be required before an individual with a medical condition may be assigned specific field tasks.
- Avoiding unnecessary or deliberate contact with any potentially contaminated substances (i.e., walking through puddles, pools, and mud) and avoiding placement of monitoring and sampling equipment on potentially contaminated surfaces.
- During the equipment decontamination process, preventing spillage of decontamination water, whenever possible. If a spill occurs, containing the liquid, if possible, and notifying the appropriate USAEC authorities and the SHSO.

- Avoiding splashing contaminated materials.
- Being familiar with the physical characteristics of the site, including:
 - wind direction;
 - accessibility to site authorities, equipment, and vehicles;
 - communications of available fire alarm boxes, telephones, and radios;
 - areas of known or suspected contaminations or "hot zones;"
 - site access;
 - nearest site resources (e.g., restrooms and breakrooms);
 - overhead power lines; and
 - buried electrical lines and underground piping systems.
- Maintaining for proper disposal all wastes generated during site operations.
- Reporting all injuries, regardless of how minor, to the SHSO.
- Reporting physically to the SHSO of any personnel incurring an injury or illness related to work activities.
- Abiding by a buddy system, with each site worker being responsible for keeping track of his or her partner in the event of an incident or emergency situation.
- Becoming familiar with the procedures required within the HASP, and CWP's.
- Conducting all tasks in accordance with the HASP and the CWP for each work project.
- Reporting to the SHSO or their direct supervisor any information regarding site operations or conditions that may have an impact on the health and safety of the operation.

4.0 RISK/HAZARD ANALYSIS

4.1 Identification and Assessment of Potential Site Hazards

Hazards that may be encountered at this site can be classified into four general categories: explosives and unexploded ordnance, chemical and radioactive, physical, and environmental hazards. Chemical hazards are site specific and involve the potential exposure to chemical contaminants in soil and ground water. Physical hazards are generally occupationally specific and may involve some type of accident, exposure to noise, and electrical hazards, etc. Environmental hazards are created by natural environmental circumstances such as poisonous plants, poisonous animals, insect bites, etc.

A preliminary evaluation will be conducted by the SHSO to ensure that site activities, personnel protection, and emergency response are consistent with the levels of contaminants expected to be encountered. Additional data obtained during the course of work will be used to update this evaluation.

If other contaminants are encountered on site all personnel will be made fully aware of their hazardous properties and the appropriate procedures that will be utilized to prevent exposure.

4.1.1 Physical Hazards

4.1.1.1 Explosives and Unexploded Ordnance

Any work, surface or intrusive, to be performed in suspect or known unexploded ordnance (UXO) areas must be accomplished in accordance with the USAEC UXO contractor requirements. Actual work locations in suspect or known UXO areas and access to them must be surveyed for UXO hazards before any field work begins.

When performing downhole magnetometry surveys during drilling operations in suspect or known UXO areas, measurement must be taken at intervals of every 4 feet to the depth of concern (unless site specific conditions indicate a necessity to perform monitoring at intervals of less than every 4 feet). The decision to perform downhole magnetometry at intervals other than every 4 feet must be justified by a site-specific analysis that supports that need. Prior to each measurement, the drill rig and equipment must be "backed off" the hole to a distance of approximately 20 feet to eliminate interference to the magnetometry equipment.

The UXO contractor shall prepare and submit to the U.S. government a final report covering all operations and activities conducted under this contract. Of particular interest is reporting the specifics of any anomalies or ferrous items recorded on instrumentation while performing downhole magnetometry.

No UXO operations will be conducted during the hours between sunset to sunrise, or during electric storms or severe weather conditions. Additionally, no UXO operations will be conducted if severe weather conditions are imminent.

Additional details of the UXO surveying program are presented in Attachment A, Standard Operating Procedure from the UXO subcontractor.

4.1.1.2 Noise

Hazard: The operation of large or heavy equipment such as drill rigs, bulldozers, and backhoes can create areas where noise levels exceed 85 decibels on the A-weighted scale (dBA). Exposure to excessive noise levels may lead to temporary or permanent hearing loss.

Controls: Hearing protection shall be worn by site personnel where noise levels are suspected or shown by noise level meter monitoring to exceed 85 dBA. The SHSO will monitor suspect areas to determine the noise level being generated. Areas where noise levels are greater than 85 dBA will be posted as "Noise Hazard Areas - Hearing Protection Required."

4.1.1.2 Site Working Conditions Hazards

Hazards: Due to the nature of the site and the fact that the work will take place outdoors, there will be a large number of physical hazards due primarily to site working conditions. These hazards include, but are not limited to, personnel encounters with objects and conditions that may cause slips, trips, falls, or cuts.

Controls: Personnel should be aware of site hazards and site conditions. Minimum PPE for site operations should include a hard hat, safety glasses with side shields or goggles, work clothing, gloves (as issued by the SHSO), and hard-toed, American National Standards Institute (ANSI) Z41.1-approved footwear.

4.1.1.3 Overhead Power Lines

Hazards: Overhead power lines pose a hazard for the operation of equipment when there is the possibility of contact.

Controls: A 50 foot minimum clearance shall be maintained from all lines 110 volts or greater. If the appropriate clearance cannot be maintained, the power lines shall be de-energized and grounded.

4.1.1.4 Buried Utility Lines

Hazards: Buried utility lines pose a hazard for the operation of equipment when there is the possibility of contact.

Controls: Fort Meade Engineering staff members will be contacted prior to any drilling activity to ascertain the presence and location of underground cables, utility lines, pipes and storage vessels at the proposed sites. Utility maps will be reviewed to determine the presence of any of the above-mentioned underground hazards. Drilling locations will also be screened for underground hazards using a pipe and cable locator prior to the commencement of any drilling activity.

4.1.1.5 Fire/Explosion

Hazards: When site work involves a disturbance of hydrocarbon-contaminated soils, the potential for a fire/explosion may be present. The primary sources of flammable gases/vapors are:

- Methane, a by-product of the decay of organic material
- Vapors from volatile organic compounds in the soil

Controls: During most operations, periodic monitoring of flammable vapors/gases using a combustible gas indicator/oxygen meter will alert site workers to the presence of dangerous concentrations of these contaminants. Air monitoring requirements for combustible gases are delineated in Section 7.1.2.4 of the HASP. ABC fire extinguishers will be provided to personnel on site. All personnel have been trained in their use. The emergency response aspects of fire suppression are included in Section 10.2.4 of the HASP.

4.1.1.6 Drilling

Hazard: Drilling activities create excessive noise, involve moving machinery, can expose workers to overhead and buried physical hazards, and can potentially expose workers to chemical and physical hazards released through contaminated soil and/or groundwater.

Controls: The selection of locations for each monitoring well drilling activity site and sampling site will take into account buried utility pipe lines, wires, conduits and tanks, or other potentially dangerous structures, including UXO and military supplies. Overhead power lines and obstructions will also be surveyed. Prior to raising the mast, the area overhead and surrounding the rig will be checked by the drilling foreman and the Site Health and Safety Officer (SHSO). No drilling will be conducted within 50 feet of an overhead power line or obstruction.

When rotary drilling/sampling, drill rods will not be racked more than one and a half times the height of the mast. During the drilling operations and rig setup and takedown, all people who enter the Exclusion Zone will wear hard hats, safety shoes/boots, protective coveralls, and safety glasses/face shields to protect themselves from the physical hazards. Respiratory protection may be required based on area and personnel monitoring.

If during drilling there is any indication that underground tanks, drums, or other containers are being encountered, the drilling will be halted immediately and the SHSO notified. Indications that a waste container may have been encountered include (1) change in the speed or momentum of the auger, (2) visual examination of auger cuttings, (3) odor noted in the cuttings, and/or (4) the presence of airborne total volatile organics as measured with a direct-reading instrument.

4.1.1.7 Sampling

Hazards: Preservatives will be applied to samples taken in the field and the possibility exists for direct contact with potentially hazardous substances.

Controls: Personnel protective equipment (PPE) must be worn as delineated in Section 5.3 of the HASP. Material Safety Data Sheets (MSDSs) will be maintained on site for all hazardous materials utilized.

4.1.1.8 Temperature Extremes

A. Heat Stress

Working in protective clothing can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the last being a life-threatening condition. If employees are dressed out in protective clothing and temperatures at the site are above 70° F, the wet bulb globe thermometer (WBGT) shall be monitored to assess the potential for heat stress. Sufficient cool water and disposable drinking cups will be provided in the rest area which would, if possible, be located in an area cooler than the work station. Work/rest schedules will be implemented, when necessary, within the guidelines of the SHSO standards.

B. Heat Exhaustion

Symptoms: Extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, pale clammy skin.

Treatment: Immediately remove victim from the work area. Allow victim to rest, cool off, and drink plenty of cool water. If the symptoms do not subside after a reasonable rest period, employees shall notify the SHSO and seek medical assistance.

C. Heat Stroke

Symptoms: Body temperatures often are between 107-110° F. Initial symptoms often include headache, dizziness, nausea, oppression, and dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

Treatment: Immediately evacuate the victim to a cool and shady area. Remove all clothing and lay the victim on his or her back with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels to the head. Sponge off the bare skin with cool water. Seek medical attention immediately.

D. Cold Stress

The primary hazards associated with working in the cold are hypothermia and frostbite.

E. Frostbite

Symptoms: Frostbite is most likely to occur in the extremities, especially in the fingers, toes, cheeks, and ears. In very early stages of frostbite, the affected body parts may feel numb and appear white. As frostbite progresses, the individual may experience pain and a loss of flexibility in the affected body part and the affected skin may appear waxy or translucent.

Treatment: Mild frostbite can be treated by immersing the affected part in warm water. Frostbitten tissue should not be rubbed. Deep frostbite is a very serious condition that requires immediate medical treatment.

F. Hypothermia

Symptoms: The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold; the heartbeat slows and sometimes becomes irregular, the pulse weakens and the blood pressure changes.

Treatment: Move the victim to a warm place. Cover the person with warm blankets, and warm the body slowly. Seek immediate medical attention.

Controls: Employees who must work under cold conditions should:

- Eat a proper diet and avoid alcohol,
- Wear proper boots and socks,
- Wear warm gloves if possible,
- Wear a hard hat liner that covers the ears, and
- Be aware of the conditions that are likely to cause frostbite and be prepared.

4.1.1.9 Confined Space Entry

Hazards: No confined space entry is anticipated during this project.

Controls: In the event that the need for confined space entry arises during site operations, the requirements of 29 CFR 1910.146 shall be fulfilled during all confined space operations.

4.1.1.10 Site Excavations

Hazards: No site excavations are anticipated during this project.

Control: In the event that the need for excavation arises during site operations, the requirements of 29 CFR 1926.650 through .652, Subpart P, shall be fulfilled during all excavation activities.

4.1.2 Chemical and Radioactive Hazards

Hazards: Overexposure to chemicals and/or radiation can result in effects ranging from no visible effect, to acute and/or chronic illness, injury, or death.

Controls: The sites have been well characterized by previous studies. Based on these studies, there has not been radioactive materials handling on this site in the past. Chemical exposure is a possibility during HHA, FTA and ODA site operations. The project Work Plans for HHA, FTA, and ODA list the primary contaminants of concern for ground water, surface water, and soils. Contaminants of concern were selected based on their toxicity and the concentrations that have previously been detected at the site. These data provide the highest known concentrations of that chemical in that medium. The concentrations listed do not necessarily reflect current conditions across the site. In addition, it is very likely that not all sources of contamination have been identified at this site.

Although the potential for acute symptoms of overexposure to site contaminants is considered low, such an occurrence would likely be the result of exposure to Volatile Organic Compounds (VOCs). Common symptoms of overexposure to VOCs include: headaches, dizziness, nausea, eye irritation, fatigue, loss of coordination, visual disturbances, abdominal pains, and cardiac arrhythmia.

MSDSs for all known or suspected site contaminants should be obtained by the SHSO prior to the start of field activities. These MSDSs shall be obtained and attached to this HASP. The MSDSs shall be available on-site during all operations.

4.1.3 Biological Hazards

Hazards: Examples of the stresses which may be encountered at the FTA include, but are not limited to, the following:

- insect bites or stings;
- ticks or other disease carrying vectors;
- poison ivy or poison sumac;
- pollens, grasses, and other allergens; and
- wildlife such as snakes, rodents, fowls, etc.

Controls: Field personnel should adhere to sanitation guidelines and site standard operating procedures in order to minimize potential contact with any hazardous biological agents.

4.1.4 Other Hazards

4.1.4.1 Illumination

Field activities at the HHA, FTA and ODA normally will be conducted during daylight hours, and a minimum of 5 footcandles will be required to conduct operations. (A footcandle is a unit of illumination equal to one lumen per square foot when measured at a surface that is everywhere one foot from a source of one candle power.) Actual field measurements of illumination will not be taken. A conservative guideline may be that field work commence 15 minutes after sunrise and could conclude 15 minutes prior to sunset. Adherence to the minimum 5 footcandles requirement will be based on the SHSO's best professional judgment.

4.1.4.2 Dusts/Mists

Some activities which operations may be conducted during site operations could have the potential to generate dusts or mists. A guideline for monitoring operations for potential dust or mist exposures is that the generation of a visible cloud of dust would constitute a need for investigation by the SHSO. Work operations should cease when visible dusts are being generated until the health and safety personnel can determine any risks of exposure.

Decontamination of equipment may involve the use of a high pressure sprayer. If the likelihood exists of contamination becoming airborne within the mist of the washer, the use of respiratory protection by decontamination personnel may be required.

4.1.4.3 Ergonomics

The interaction of personnel with their working environment at this site may also present potential hazards such as the incorrect lifting of heavy loads, equipment vibrations, improper body positioning, and negotiation of physical obstacles when accessing confined spaces. All of the aforementioned conditions are potential factors in site operations. Personnel should always position themselves properly and lift from the legs when lifting equipment or heavy objects and rely on the buddy system for assistance in lifting loads that are too heavy for one person. Back strain, the most common ergonomic hazard in the field, may be avoided, if site workers ask for assistance when they need it.

4.1.4.4 Hot Work

Hazards: No hot work is anticipated during site operations.

Controls: In the event hot work operations are required, the activities must be approved by the SHSO.

4.1.4.5 Heavy Equipment

Hazards: The hazards associated with the operation of heavy equipment are generally personnel injury, equipment damage, or property damage.

- Controls:**
- All heavy equipment shall be used in the manner intended. Drivers will operate all equipment in accordance with the manufacturers' instructions and within the safe operating parameters defined by the manufacturer.
 - All heavy equipment shall have current annual inspection certifications before use.
 - All heavy equipment shall be inspected daily by the operators or, as required, by certified inspectors before operations begin.
 - Applicable monthly, quarterly, and special inspections shall be completed prior to equipment operation. Completed instruction forms shall be available on-site at all times.
 - Where possible, heavy equipment in stationary operations should be barricaded (with hazard tape) at a sufficient distance for ground personnel to avoid swinging cabs, counterweights, and booms. When ground personnel are working in the vicinity of heavy equipment, they should inform the flagman of their presence.

4.1.4.6 Flammable Materials

Hazards: Flammable materials pose hazards as ignition sources. MSDSs for all site materials will be maintained on-site by the SHSO.

- Controls:**
- Flammable liquids shall be stored in an Underwriters' Laboratory (UL)-approved safety container designed and labeled for that purpose.
 - Flammable materials shall be stored in a common location to be determined by the SHSO.
 - No smoking or open flames shall be permitted within 50 feet of stored flammable materials.
 - Vapors from opened monitoring wells may be flammable and will be monitored during all activities for explosive atmospheres.

4.1.4.7 Compressed Gases and Systems

Hazards: No compressed gases and/or systems are expected to be used during site operations.

Controls: Any activities requiring compressed gas cylinders or systems should be evaluated and approved by the SHSO.

4.1.4.8 Destruction of Concrete

Hazards: The destruction of concrete poses the following hazards:

- A possibility for increased airborne concentration and inhalation of site contaminants. This is likely to occur if the ground below is heavily saturated with contaminants or contaminated water.
- A possibility for increased dust exposure when using a concrete saw.
- Flying debris will present eye and head injury hazards.
- Noise in excess of 85 dBA may be generated.
- Vibration to the hands and body of the person operating a jackhammer or other soil-breaking device.

Controls:

- Use engineering controls, as necessary, to reduce the level of exposure.
- Wear eye, face, head, and respiratory protection, as determined necessary by the SHSO.
- Use a sufficient supply of water to keep the operation wet and thus reduce the dust.
- Wear hearing protection as required. If ear plugs do not offer enough protection, use earmuff-type hearing protectors and plugs.
- To combat jackhammer vibration, provide good vibration-absorbing hand grips.

4.1.4.9 Adverse Weather Conditions

Hazards: During adverse weather conditions, lightning strikes to personnel or equipment may occur without warning. Lightning may be attracted to drill rigs, bulldozers, or other types of site equipment. Lightning can strike with relatively little or no warning, at any time when thunderclouds gather or when thundershowers are forecast. It is imperative that weather updates be monitored closely during field work, particularly in the summer.

Controls:

- In the event of thundershowers, shut down equipment and proceed to shelter.
- Wait a minimum of 30 minutes from the last lightning strike before returning to work.
- All drill masts and booms shall be lowered in the event of a lightning storm.

4.1.4.10 Traffic

Hazards: The possibility of vehicle-related injury or accident is inherent to field work. Accidents may occur during travel to or from the site as well as during on-site activities.

Controls: Vehicle and equipment operators shall adhere to federal, state, and local regulations regarding the operation of their motor vehicles and equipment. The number of passengers in or on a vehicle or piece of equipment shall not exceed the number that can be seated with a functional seat belt. Seat belts shall be used at all times by the persons riding in or on vehicles or equipment.

Personnel will not ride in/on vehicles or equipment in a manner not designed for conveyance of personnel (e.g., riding on the running boards of trucks or the fenders of front-end loaders). All vehicles that will enter the HHA, FTA and ODA must be registered with the SHSO.

4.1.4.11 Underground Hazards

Hazards: Underground hazards occur when underground installations are encountered during drilling or excavation work. These structures include gas utilities, power lines, product lines, concrete vaults, and tanks. These present a potential for electrocution, explosion, spills or releases, or injuries to the field personnel.

Controls: A pre-excavation meeting will be held to review the Excavation/Penetration Permit and work area to ensure all underground installations have been identified.

4.1.4.12 Hoisting and Rigging Operations

Hazards: No hoisting or rigging operations are expected during routine site operations.

Controls: If hoisting and rigging operations are required, approval is required from the SHSO.

5.0 SITE ACCESS REQUIREMENTS

Primary access to the HHA, FTA and ODA sites is controlled by means of monitoring personnel identification badges. Distribution and control of site access badges will be coordinated with the USAEC by the SHSO. To obtain access, all anticipated on-site employees are to complete a request form and meet the requirements described therein.

The minimum requirements for access on to the HHA, FTA and ODA sites are listed below. The health and safety training complies with the requirements specified in 29 CFR 1910.120.

- All personnel with access to the HHA, FTA and ODA are required to have a minimum of 24 hours of health and safety training.
- All personnel who will be performing work as hazardous waste site workers at the FTA and the HHA are required to have a minimum of 40 hours of health and safety training.
- All visitors who are granted site access are required to be escorted at all times by a person who meets the above-stated access requirements. Additionally, visitors are to abide by all requirements of the HASP.

5.1 Worker Training Requirements

The requirements for worker training for work projects conducted under this HASP shall be determined by the anticipated role of the worker and the job tasks which he or she is required to perform during each work project. Minimum training requirements for entry into a site for routine or occasional workers, CRZ or EZ workers (Levels A, B, C, and D workers), on-site supervisors, and non-workers or site visitors are listed below in Table 5.1. The regulatory basis for the requirements presented in Table 5.1 is located in 29 CFR 1910.120.

Other worker training requirements, will be project- and task-specific, and may include, but are not limited to, courses on the following subjects: respiratory protection, asbestos, hazard communication, specific carcinogens, and operation of specific equipment. The training requirements shall be dictated by 29 CFR 1910, 29 CFR 1926, and any other regulatory standards which would be applicable to site operations.

5.1.1 Training Documentation

Acceptable forms of documentation of worker training will be up-to-date certificates of training for all completed courses which are required for site access and operations. An up-to-date respiratory fit-test card will serve as an acceptable form of training documentation, as applicable. Training records will be maintained by the SHSO.

Table 5.1 Site Training Requirements

Operation Personnel	Site Health & Safety Briefing	24-Hr	40-Hr	8-Hr Supervisor	8-Hr Refresher ¹	Radiation Worker
Visitor ²	X					
Routine or Occasional Worker	X	X ³	X ⁴		X	X
On-Site Supervisor	X	X ⁵	X	X	X	X
Level A or B PPE	X		X		X	X
Level C PPE	X	X	X		X	X
Level D or No PPE	X	X	X		X	X

1. Annual requirement; however, personnel not receiving refresher training within 3 years of initial training or last refresher course at a minimum should repeat the initial course.
2. All visitors should be issued and instructed on the use of required PPE, receive a site-specific safety briefing, and be escorted by trained personnel. Visitors include personnel such as public officials, reporters, etc.
3. 24-hour training is adequate for workers if they are onsite only occasionally for a specific task (such as but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits. Examples of occasional workers include auditors and oversight personnel.
4. USAEC personnel are required to have 40 hours of health and safety training.
5. Supervisors of on-site workers who require only the 24-hour course need only take the 24-hour initial and 8-hour supervisor courses.

5.1.2 Equivalent Training

In special circumstances, according to the provisions of 29 CFR 1910.120 (e)(9), equivalent training such as hazardous waste site work experience, academic training and/or other forms of certification or training may be considered acceptable for compliance with the training requirements of 29 CFR 1910.120(e)(1) through (e)(4). The determination of whether equivalent training status is granted shall be determined and documented in writing by the SHSO.

5.2 Pre-Entry Health and Safety Briefing

All personnel shall be required to attend a pre-entry health and safety briefing prior to entering the site as a requirement for site access. This pre-entry health and safety briefing shall be conducted by the SHSO or by designated representatives who have been approved by the CSHD. The pre-entry health and safety briefing shall highlight the health and safety information presented in this HASP and the information contained in the CWP. This information may include, but is not limited to, the following:

- Site history.
- Site access requirements.
- Site chemical hazards and symptoms of exposure.
- Site physical hazards and recognition of hazards.
- Personnel and equipment decontamination requirements.
- Location of the site emergency assembly point.

- Emergency procedures.
- Location of the site emergency action plan.
- Other applicable information.

5.2.1 Documentation of Briefings

Attendance at the initial pre-entry health and safety briefings will be documented by the signature of all personnel present at the briefing and by the completion of the Personnel Training and Physical Examination Record.

5.2.2 Daily and Periodic Health and Safety Briefings

Daily safety briefings (or tail-gate meetings) will be conducted by the SHSO for all personnel. In addition, periodic health and safety briefings shall be held as necessary at the discretion of the CSHD, SHSO, and/or the SPM in order to summarize planned activities, to identify new hazards, or to clarify any task or project-related issues. All site personnel anticipated for the day's activities will be required to attend. The periodic health and safety briefings may include, but are not limited to, the following subjects:

- Task-specific PPE and respiratory requirements.
- Requirements for Safety Work Permits.
- Standard operating procedures (SOPs).

5.3 Personal Protection Requirements

5.3.1 Respiratory Protection

All respiratory equipment shall be approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA). All personnel required to use respiratory protection shall have an up-to-date quantitative respirator fit test and will wear only those respirators approved by the quantitative fit test. No site personnel will be issued a respirator without a valid respirator card.

5.3.2 Personal Protective Equipment

The SHSO shall specify the personal protective equipment (PPE) required for site activities, tasks, and work zones. This specification shall be based on possible site contaminants, OSHA guidelines, and chemical and radiological hazards information.

The PPE required may include, but is not limited to, the ensembles listed below in Table 5.3.

Table 5.3 Protective Equipment Levels

PPE LEVEL	PROTECTIVE EQUIPMENT*
D	Hard hat Safety glasses Steel-toed footwear Field work clothes Face shield ^b
D+	Above protection plus: Chemical-resistant polyethylene-lined Saranex [®] clothing Chemical-resistant disposable gloves Nitrile or butyl rubber outer boots
C	Above protection plus: Inner gloves Full-face respirator with organic vapor/high efficiency dust and mist cartridge. Other cartridges, PPE, or respiratory protection may be required depending upon site conditions.
* Chemical-resistant gloves, outer boots, and Saranex[®] clothing may be worn by personnel to reduce the danger of potential splashing and to maintain personal hygiene. The information in this table should not be construed to mean that all personnel are required to conform to this practice. All site personnel and visitors must contact the SPM or SHSO to confirm actual personal protection requirements prior to entering the site. ^b Full-faced face shield mounted on hard hats with safety glasses will be worn during the decontamination process.	

The requirement listed in Table 5.3 that safety glasses be worn under Levels D and D+ of protective equipment will not apply when the requirements for protective equipment are upgraded to Level C and respiratory protection with a full-face mask is required. Where the potential for chemical contaminant absorption exists, the outer protective garment will be made of a chemical-resistant woven material (Saranex[®] or a more protective material) which forms a protective barrier against detrimental chemicals for a specific period of time based on the chemical in question. Each chemical has its own permeating ability, and the resistance of the protective clothing will vary with each chemical. For some chemicals, the risk of chemical permeation increases when an outer protective garment becomes damp from soil or water contact. The SHSO shall determine the appropriate PPE ensemble, with input from the CSHD as needed.

5.3.3 PPE Upgrade Authority

Persons with the following site roles shall have the authority to order the upgrade or downgrade of PPE levels during ongoing site activities: the CSHD or the SHSO. At a minimum, the upgrade or downgrade of PPE levels must have the approval of both a health and safety representative and the Task Manager. The consensus to upgrade or downgrade PPE levels and

the basis for the decision shall be recorded on all applicable project documentation including the project logbook and/or SWPs. The CSHD shall ensure that this documentation is completed.

All site personnel shall be made aware of the upgrade or downgrade and shall be provided updated procedures for donning and doffing and decontamination activities. These updated procedures shall be attached or appended to the project CWP or incorporated by reference.

5.3.2 Donning and Doffing Personal Protective Equipment

Procedures for donning and doffing PPE will be dependent upon the type of ensemble required to control worker exposures during anticipated site operations. Specific procedures shall be determined by the SHSO and shall be included as an appendix to the HASP. If established SOPs for donning and doffing are in existence, the SOPs may be incorporated by reference.

5.4 Medical Surveillance

5.4.1 HAZWOPER Physicals

According to the requirements of 29 CFR 1910.120, all site personnel who participate in activities conducted on a hazardous waste site must have a physical examination conducted by a physician in order to determine and document the qualification of the worker to perform work at hazardous waste operations. The SPM and SHSO will determine which workers from the list of personnel for this project will be required to participate in the hazardous waste worker medical surveillance program.

5.4.2 Medical Monitoring

The requirements for medical monitoring of worker exposures is dictated by the requirements of 29 CFR 1910.

6.0 FREQUENCY AND TYPES OF MONITORING

6.1 Exposure Monitoring

6.1.1 Area Monitoring

Periodic, real-time assessment of potentially hazardous chemical concentrations using direct reading instruments will be performed while operations are being conducted at the site. Prior to the commencement of any field activities, background concentrations and levels near the site will be monitored and recorded in the site logbook. To obtain accurate results, daily background readings shall be taken away from areas of potential contamination.

The SHSO shall designate one of the team members as the Task Health and Safety Officer and this person shall use a properly calibrated HNu PI-101 photoionization detector (PID), or equivalent instrument, equipped with the appropriate lamp, to:

- A. Monitor organic vapors at several on-site areas at the beginning of each day to establish a background reading.
- B. Monitor organic vapors at the worker's breathing zone, hand auger spoils, and above ground water wells.
- C. If elevated levels of organic vapors are detected, the worker's breathing zone will be monitored continuously while in the area, or for 15-minute periods every half-hour.
- D. Traditional industrial hygiene air monitoring for organic vapors and dusts may also be performed during potential high exposure activities, and at the discretion of the SHSO.
- E. Monitor when work begins on a different portion of the site.
- F. Monitor when contaminants other than those previously identified are being handled.
- G. Monitor when a different type of operation is initiated.
- H. Monitor if personnel are working in areas with obvious liquid contamination.
- I. Monitor if a sufficient reasonable interval has passed so that exposures may have significantly increased.

Measurements shall be taken at the anticipated source and in the breathing zone of site personnel during all invasive operations. Response action levels are presented in Table 7.1.

Instruments shall only be used by employees who have been trained in the proper operation, use, limitations, and calibration of the monitoring instrument and who have demonstrated the skills necessary to operate the instrument.

The monitoring program may be expanded, reduced, or modified by the SHSO with concurrence of the CHSD, based on site conditions and monitoring results. All monitoring will be accomplished under the direction of the SHSO, who will interpret the results with the guidance of the SHSO.

6.1.2 Monitoring of Personnel

Personal exposure monitoring (i.e., exposure monitoring for specific contaminants) shall be conducted in accordance with the requirements of 29 CFR 1910 Subpart Z. Monitoring will be conducted by the SHSO or a designated representative in accordance with monitoring procedures. The need for personal exposure monitoring will be based upon site contaminants and work hazards and will be determined by the SHSO.

6.1.3 Real Time Air Monitoring

The air monitoring program will include sufficient monitoring of air quality in work zones and other on-site areas to assess levels of potential employee exposure, establish work zones, determine that the work zone designations are valid, and verify that the respiratory protection being worn by personnel is adequate. The air monitoring program is also designed to ensure that contaminants are not migrating off site in order to minimize exposure of nearby populations, work areas and/or workers.

6.1.4 Perimeter Monitoring

If detectable concentrations are measured during the on-site activities, monitoring shall also be conducted at least two times each day with a total volatile organics direct-reading instrument at the perimeter of each site. If airborne levels of contaminants exceed background levels at the perimeter of any site, the work will be stopped and the suspected source of the contamination (e.g., borehole or monitoring well) will be covered to eliminate emissions. If the emissions are not reduced in a reasonable period of time (e.g., 15 minutes), the SHSO will notify the appropriate USAEC authorities and the Analysas Corporation CHSD. A decision will then be made as to how to proceed with the work and how to more fully characterize the airborne emissions.

6.1.5 Flammable/Combustible Gases

Monitoring at potential sources of combustible gases shall be conducted periodically during operations involving penetration of soils. If instrument readings indicate 10 percent of the lower explosive limit (LEL) or less, work shall continue with increased monitoring. If readings exceed 10 percent of the LEL, operations shall cease and personnel will withdraw until levels subside (at least 15 minutes). If levels do not subside, special arrangements for on-site portable ventilation systems may be needed.

6.1.6 Oxygen Deficiency

Oxygen levels will be periodically monitored using a direct reading combustible gas/oxygen meter. If monitoring indicates less than 19.5 percent oxygen, activities in the area will be stopped until the source causing the oxygen deficiency is identified and controlled. In addition, methane concentrations may be periodically monitored during the landfill activities using Drager colorimetric indicator tubes. If available, an Organic Vapor Analyzer (OVA) could also be utilized to detect low levels of methane on site.

6.1.7 Respirable Dust

Monitoring for respirable dust may be necessary to estimate employee exposure to heavy metals and semivolatile organic compounds that may comprise part of or be adhered to dust particles generated during site operations. Continuous monitoring of the site workers' breathing zone may be performed during all drilling operations using a direct-reading respirable dust monitor where the generation of dust is likely.

6.2 Monitoring Equipment

Various types of monitoring equipment may be required to conduct worker exposure monitoring during HHA, FTA and ODA operations. The SHSO shall ensure that adequate monitoring equipment is available prior to the start of work. The CHSD shall ensure that the instruments are used only by persons with training and experience in the care, operation, calibration, and limitations of the equipment. Persons performing monitoring shall be approved by the CSHD. Work involving potential exposure to hazardous materials shall not be performed unless properly maintained and calibrated monitoring instruments are available for use.

Instrumentation such as the following may be used to identify the presence of and/or to quantify the potential health hazards in existence at the site:

- **Combustible gas/oxygen meter:** To measure combustible gases and oxygen content in confined spaces, trenches, and other areas that may have limited ventilation.
- **High-flow air sampling pumps:** To sample and evaluate the air quality on-site. These instruments shall be calibrated before and after each use by the SHSO or qualified designee.
- **Personnel air sampling pumps:** To collect personal samples if airborne contaminants are encountered. These instruments shall be calibrated before and after each use by the SHSO or qualified designee.
- **Total organic vapor monitors:** PID or flame ionization detector (FID) to survey the soil and air for possible chemical or organic contamination. The instrument is not chemical-specific; therefore, it can only indicate the presence of volatile organics which are detectable in the range of the instrument.
- **Colorimetric detector tubes:** For field identification of specific chemical contamination presence and for providing a rough estimate of the concentration level. These instruments shall be leak-checked prior to each use.
- **Noise monitoring equipment:** To identify "problem" noise areas and equipment. These instruments shall be calibrated prior to use.
- **Wet bulb globe thermometer (WBGT):** May be used to detect possible heat stress conditions. These instruments will be calibrated according to the manufacturer's specifications.
- **Portable gas chromatograph (GC):** May be used to help evaluate and isolate potential volatile components measured in the breathing zone by the PID or FID.
- **Portable alpha and beta-gamma survey meters:** To survey for radioactive contamination on personnel and equipment. These instruments shall be source-checked daily and calibrated at least quarterly.
- **Air sampling equipment:** To identify and quantify airborne radioactivity or specific chemical contaminants through laboratory analysis of samples.

6.3 Calibration Requirements

All monitoring and detection instruments used during field operations shall be calibrated within the proper time frame and in accordance with the manufacturer's recommendations, guidelines, and specifications described in the manufacturer's SOPs. Written standard procedures for instrumentation operation and calibration shall be used on-site and incorporated into this HASP by reference or by attachment. All instrumentation operation and calibration shall be conducted in accordance with appropriate procedures, where applicable and available. If field or standard instrumentation procedures are used during site operations, the written procedures must be attached as an appendix to this HASP. These written procedures shall be reviewed by the appropriate parties including, but not limited to, the CHSD and the SHSO prior to use in field operations.

All chemical instrument calibration gas cylinders used in field calibrations must have a manufacturer's label with the lot number, the manufacturer's name, the type of gas, and the ppm or percent of gas concentration contained within the cylinder. Calibration readings, the lot number from the calibration gas cylinder, the calibration gas manufacturer, and each number of the radiological source will be recorded on the Daily Instrument Calibration Check Sheet which is a section of the project field logbook dedicated to instrumentation daily calibration, maintenance and use, as well as other information pertinent to field instruments.

6.4 Monitoring Response Guidelines

During site operations, the decisions to upgrade or downgrade PPE levels; to re-establish site EZ, CRZ, and/or Support Zones; or to cease work activities may be made on the basis of site monitoring results. These changes can only be authorized by site authorities including the SHSO and/or appropriate USAEC authorities. These response guidelines are dependant upon the type of work being conducted, the suspected contaminants, and the health effects and toxicity of the contaminants. Therefore, monitoring response guidelines shall be established for real-time site assessments in the project CWP.

7.0 SITE ZONES AND CONTROL MEASURES

Where there is a potential for employee exposure to hazardous chemicals or the accidental spread of hazardous substances to clean areas, work zones will be established to separate certain operations and to control the flow of personnel and equipment. The establishment of work zones will help ensure that personnel are properly protected against hazards at the work site, that work activities and contamination are confined to the appropriate area, and that personnel can be evacuated and accounted for in the event of an emergency.

All work operations will be scheduled so that no employee works alone on site at any time. Each worker will maintain visual contact with another specified worker at all times. The buddy system will ensure against an employee becoming stressed, ill, or injured without a co-worker being aware of his or her condition. Workers must watch out for each other while working close to potential chemical and physical hazards.

7.1 Work Zones

Work zones are designed to prevent employees, visitors, and the surrounding environment from exposure to contamination during all aspects of site investigation activities. All work zones and support areas will be established by the SHSO. Movement of personnel and equipment between zones and on and off the site will be controlled by means of designated access points.

The SHSO establishes these zones based on the amount and nature of contamination present and the specific work activities. The SHSO will modify these zones as necessary to meet the needs of the site. The SHSO will also control access to and from the EZ and the CRZ. The SHSO will periodically monitor the perimeter of the zones to ensure their effectiveness.

The site control zones will be isolated from the rest of the work site by use of rope, fences, barricades, or warning signs. No person will enter the EZ or CRZ without proof of sufficient training and appropriate medical clearance as required by this HASP and OSHA 1910.120. A daily log of all persons entering and leaving the CRZ will be maintained by the SHSO or designee in the project logbook.

The following protocols will be followed when leaving the Exclusion Zone and Contamination Reduction Zone:

- All personnel will exit through the designated exit points.
- All personnel will proceed through appropriate decontamination.

All protective equipment will be removed in the Contamination Reduction Zone.

7.1.1 Exclusion Zone

During select on-site operations, the SHSO may determine that it is necessary to establish and maintain Exclusion Zones. The Exclusion Zones may be marked using plastic caution tape supported by metal or wood stanchions, safety cones and flagging tape, or other equivalent demarcation methods. The Exclusion Zones encompasses the surface areas within a 50-foot radius around the location of drilling operations. A formal exclusion zone may not need to be established for other planned operations; however, steps must be taken to ensure that personnel and equipment are properly decontaminated and that contaminated materials are not removed from the work area.

The SHSO will be responsible for coordinating the prohibition of non-essential personnel within the Exclusion Zone boundaries. Prior to entering the Exclusion Zone, site personnel shall have donned the proper PPE for expected site conditions and the particular operation, as determined by the SHSO.

7.1.2 Contamination Reduction Zone

The Contamination Reduction Zone will be established as a buffer zone between the Exclusion Zone and the Support Zone of each drilling site. All personnel and equipment leaving the Exclusion Zone will do so through the Contamination Reduction Zone. The personnel and equipment decontamination stations will be located in this zone.

Contamination Reduction Zones, or decontamination zones, shall be established adjacent to the Exclusion Zones. Personnel exiting the Exclusion Zones shall undergo appropriate decontamination activities as directed by task-specific procedures.

7.1.3 Support Zone

The Support Zone will be established near the site entrance. All Analysas Corporation personnel and subcontractors must obtain an identification badge from the SHSO and display the badge at all times. No special clothing or protective equipment, unless otherwise determined by the SHSO, is required in this area. Operational and support facilities (supplies, equipment, storage, and maintenance areas) will be located in this area.

7.2 Action Levels

Action levels and the appropriate emergency action are summarized in Table 7.1 and discussed in detail below.

Table 7.1 Action Levels and Emergency Information

Chemical Vapors	
Action Levels	Emergency Action
Background or below sustained for 5 minutes	Continue at modified level D.
Background to <5 ppm sustained for 5 minutes	Upgrade to level C and continuous monitoring.
Greater than 5 (>5) ppm above background sustained for 5 minutes or a peak reading of 30 ppm or greater	Discontinue operations in immediate area. Characterize airborne contaminants via personnel and area monitoring including contaminants that could be present which are not detected by PID equipment. Contact the HSO or SHSO for advice on how to proceed. Level B protection may be needed.
Explosive Limit Detection	
Action Level	Emergency Action
10% of lower explosive limit	All workers in the area should retreat immediately and evaluate the situation. Report observations and instrument readings to the SHSO. Ventilation may be required to resume work in this area.
Radiation Detection	
Action Levels	Emergency Action
$X < 50 \mu\text{R/hr}$	Level D normal monitoring during sampling procedures.
$50 \mu\text{R/hr} < x < 200 \mu\text{R/hr}$	Level D periodic monitoring (every 30 minutes).
$200 \mu\text{R/hr} < x < 2 \text{ mR/hr}$	Level D continuous monitoring - worker exposures assessed.
$x > 2 \text{ mR/hr}$	Work site evacuated. Contact HSO or RSO.
Respirable Dust	
Action Levels	Emergency Action
5 mg/m^3	Upgrade to the appropriate respiratory protection (i.e., air purifying respirator with particulate cartridges).

7.2.1 Chemical Vapors

All field work (see Section 2.1.2.1) will commence with Modified Level D personal protection (see Section 5.3.2). Based on positive direct reading instrument levels in the breathing zone or site conditions, the SHSO shall upgrade personal protection equipment requirements as described below.

The following action levels are based on PID *breathing zone readings* and observations of site conditions:

- Background or below: *Continue at Modified Level D.*

- Background to 5 ppm sustained for five minutes: *Upgrade to Level C and Continue Monitoring.*
- Greater than 5 ppm above background sustained for five minutes or a peak reading of 30 ppm or greater: *Discontinue operations in that immediate area. Make arrangements to further characterize airborne contaminants via personal and area monitoring including contaminants that could be present which are not detected by PID equipment. Contact the SHSO for advice on how to proceed. Level B protection may be needed for work to continue.*

7.2.2 Explosive Limit Detection

Based on a positive reading on the combustible gas indicator of 10 percent of the lower explosive limit (LEL), all workers shall not enter, but shall retreat immediately from the area and evaluate the situation. Report observations and instrument readings to the SHSO, who will advise workers on safety measures necessary before returning to work in the area. A means of ventilation may be required in order to resume work in this area.

7.2.3 Radiation Detection

To our knowledge, no radiation monitoring has been conducted in the areas of concern. From our initial review of site documentation, radioactive areas are not anticipated to be encountered. However, if it is determined that a radiation monitoring plan and program is required, the SHSO will initiate the process. Site personnel must then comply with the following action levels when the radiation monitoring program is in effect:

Table 7.2 Total External Exposure

$x < 100 \mu\text{R/hr}$	Level D	Normal monitoring during sampling procedures
$100 \mu\text{R/hr} < x < 200 \mu\text{R/hr}$	Level D	Periodic monitoring (every 30 minutes)
$200 \mu\text{R/hr} < x < 2 \text{ mR/hr}$	Level D	Continuous monitoring - worker exposures assessed
$x > 2 \text{ mR/hr}$		Work area evacuated and the SHSO or Analysas Corporation Radiation Safety Officer (RSO) contacted

7.3 Site Communications

Several means of communication may be available for use during site operations. Where applicable, the location of the means of communication shall be addressed in the pre-entry health and safety briefing. Communications on site, including into or out of the Exclusion Zone, will generally be accomplished by voice; however, walkie-talkie devices and cellular phones will be available during on-site activities. If more than two people require or request the use of the walkie-talkies for the same day then the site supervisor shall resolve who has priority, provide additional communication devices, reschedule one or more tasks, or otherwise resolve this situation to the satisfaction of interested parties and the SHSO. Prior to conducting work in a particular area, the Project Field Supervisor will locate the nearest telephone and instruct all

personnel regarding its location. A cellular telephone(s) will also be available on site for the sole purpose of emergency notification.

The "buddy system" as described in 29 CFR 1910.120(a)(3) shall be used during site operations and activities conducted in the CRZ and the EZ. Hand signals shall be used as the means of site communication in the Support Zone, CRZ, and EZ when distance or noise levels prevent verbal communications. Basic hand signals and their meanings during site operations are listed below.

- Thumbs up "Okay" or "I Understand."
- Thumbs down "No," "Negative" or "I Do Not Understand."
- Grasping buddy's wrist "Evacuate!" or "Leave The Site Now!"
- Hands on top of the head "I Need Assistance" or "Help!"
- Hand on the throat "I Am Choking" or "I Can't Breathe!"

7.4 Sanitation

7.4.1 Housekeeping

The site shall be maintained in an orderly manner, free of congested waste material and debris. All contaminated and noncontaminated waste shall be handled appropriately according to USAEC's policies and procedures.

7.4.2 Potable Water

- Cool drinking water shall be made available in a designated "clean" area.
- Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap.
- Containers used to distribute drinking water shall be clearly marked as to their contents and not used for any other purpose.
- When single-service cups (to be used one time) are supplied, both a sanitary container for dispensing unused cups and a receptacle for disposing of the used cups shall be provided.

7.4.3 Consumption of Food and Tobacco Products

Eating, drinking, and use of tobacco products on the HHA, FTA and ODA sites are confined to "clean" areas only. Clean areas will be designated and marked by the SHSO. These clean areas shall be surveyed regularly for contamination.

Food will be handled by "clean" personnel only. As a minimum control measure, all personnel who have been in the CRZ must wash their hands before handling food. Suspected contamination of any of the approved areas will result in discontinuation of their use for food

handling or storage. At the HHA, FTA and ODA site, food and beverages will be allowed only in areas designated by the SHSO.

7.4.4 Washing Facilities

Adequate washing facilities will be provided for employees engaged in operations where hazardous substances may be present. Facilities for washing hands and face will be available in the CRZ and in break zones or areas designated for eating. Wash water will be collected in buckets and proper disposal will be coordinated by the SHSO.

7.4.5 Restroom Facilities

Fort George G. Meade restroom facilities are available for HHA, FTA and ODA workers. The restroom facilities will be located in designated "clean" areas or break areas which will be indicated during pre-entry health and safety briefings.

8.0 DECONTAMINATION PROCEDURES

8.1 Personnel Decontamination

Personnel decontamination procedures are designed to eliminate or limit the contaminated materials which workers may encounter and to limit the spread of contamination from the EZ and CRZ. Decontamination procedures for PPE Levels C, D+, and D are described and illustrated below in Sections 8.1.1, 8.1.2, and 8.1.3. These procedures have been provided only as *guides* for personnel decontamination. Actual site conditions, PPE ensembles, and conditions may differ from those described below. If the decontamination procedures required for site activities differ from these guidelines, the actual decontamination procedures will be attached to this HASP as an attachment or included in the project CWP. The SHSO shall determine and instruct site personnel in the proper decontamination steps once the decontamination procedures have been approved by the CHSD.

8.1.1 Level D Protection Decontamination

Station 1: Work area.

This is the area of greatest potential for exposure to site contaminants.

Station 2: Scrubbing and rinsing tools or outer garment, boots, gloves, hard hats, and safety glasses.

Scrub outer boots and gloves with a laboratory-grade detergent (Liquinox or equivalent) and rinse with potable water. Disposable boots and gloves need not be scrubbed and may be disposed of in compactible waste drums. Clean safety glasses and hard hat in the same fashion. If boots must be decontaminated, all decontamination should take place while personnel are standing in large wash tubs so that decontamination solutions can be caught and drummed in accordance with proper procedures.

Equipment necessary:

- two or three washtubs
- one hand-pump sprayer
- potable water
- detergent
- scrub brushes
- paper towels
- 55-gallon drum with liner for paper towel and protective clothing disposal

Station 3: Outer garment, boots, gloves, safety glasses, and hard hat removal.

Remove boots, gloves, safety glasses, and hard hats.

Station 4: Inner glove removal.

Remove inner gloves.

Station 5: Field wash.

Thoroughly wash hands and face with soap and water and a soft-bristle brush, if necessary. Shower as soon as possible.

Equipment necessary:

- water
- wash basin or bucket
- soap

If no contamination was detected, proceed to Station 7.

Station 6: Step across line.

Enter the designated support zone.

8.1.2 Level D+ Protection Decontamination

Follow the steps for Level D decontamination; the only difference occurs at station 3. Remove the disposable chemical protective coverall and deposit it in a lined 55-gallon compactible waste drum. Level D+ protective clothing is deemed necessary when sampling operations may produce excessive splashing of surface or subsurface materials, yet the action level does not require the use of a respirator and taped, protective, chemical-resistant suits.

8.1.3 Level C Protection Decontamination

Station 1: Work area.

This is the area of greatest potential for exposure to site contaminants.

Station 2: Scrubbing and rinsing of outer garment, boots, and gloves.

Scrub outer garment, boots, and gloves with laboratory-grade detergent and water and rinse with potable water. All wash water and rinsing solutions will be disposed of in accordance with the CWP. NOTE: This station is not necessary when disposable PPE is used.

Equipment necessary:

- washtubs
- potable water
- detergent
- scrub brushes

Station 3: Outer garment, boots, and gloves removal.

Remove outer garment, boots, and outer gloves and accompanying tape. Tape and disposable gloves should be placed in a plastic trash bag and disposed of in accordance with appropriate procedures.

NOTE: This station is not necessary when disposable PPE is used.

Equipment necessary:

- plastic trash bags
- bench or stool

Station 4: Respiratory protection and disposable inner glove removal.

The respirator is the next-to-last item for removal. Cartridges or canisters are placed in a plastic trash bag and disposed of in accordance with procedures. The respirator is placed in a plastic bag dedicated for used respirators. Remove disposable inner gloves and deposit them in a plastic trash bag.

Equipment necessary:

- plastic trash bags

Station 5: Field wash.

Wash hands and face thoroughly with soap and water and a soft-bristle brush, if necessary.

If no contamination was detected, proceed to Station 6.

Station 6: Step across line.

Enter the designated support zone.

8.1.4 Segregated Equipment Drop and Canister or Cartridge Change

Station 1: Work area.

This is the area of greatest potential for exposure to site contaminants.

Station 2a: Segregated equipment drop.

Deposit equipment used on-site (e.g., tools, sampling devices, containers, monitoring equipment, and clipboards) on a plastic drop cloth or in a container with a plastic liner. Either return immediately to the EZ or proceed to Station 2 of the decontamination process described below.

Equipment necessary:

- containers
- plastic liners
- 55-gallon compatible waste drum

Station 2b: Canister or cartridge change.

When the respirator canister or cartridge has been replaced, put the used canister or cartridge in a plastic bag for disposal.

Equipment necessary:

- respirator cartridges or canisters
- plastic trash bags

8.1.5 Emergency Decontamination

In the event that the emergency decontamination of site personnel is required due to site conditions, exposure to site contaminants or other hazards, personnel injury or illness, the worker(s) will be removed from the EZ to the CRZ by rescue personnel or the SHSO. Site operations will be shut down. Site conditions must be monitored to and rescue personnel must be properly protected by PPE and respirator protection prior to initiating rescue efforts, if applicable under site conditions. First aid will be administered, if applicable, to the site worker(s) by the CHSD or SHSO and site emergency decontamination will be overseen or administered by the SHSO. The appropriate USAEC authorities will be notified and, if necessary, emergency transportation to the hospital will be initiated.

8.2 Equipment Decontamination

All equipment being used in the Exclusion Zone will be subject to complete decontamination procedures before the equipment is removed from these work areas.

Equipment and vehicles that contact potentially contaminated soil will be decontaminated using a detergent solution and a steam cleaner or hot water pressure washer. All contaminated items will be carefully inspected and/or decontaminated to the satisfaction of the SHSO before being taken off site.

8.3 Disposal of Wastes During Investigation Activities

Waste solids generated by the investigative activities (including used respirator cartridges and disposable protective coveralls) will be drummed, labeled, and stored on site for disposal as hazardous wastes. Suspect hazardous waste fluids generated during drilling activities will also be containerized in 55-gallon drums and stored in the Contamination Reduction Zone for proper disposal by Fort Meade personnel.

9.0 STANDARD OPERATING PROCEDURES

9.1 Safe Work Practices

9.1.1 General

Safe work practices, which must be followed by all site workers, include, but are not limited to, the following:

- Eating, drinking, chewing gum or tobacco, and smoking are strictly prohibited in the Exclusion and Contamination Reduction Zones and in the vicinity of all work operations. Break areas will be designated by the SHSO for these activities.
- Do not sit or kneel in areas of potential contamination.
- Hands and face must be thoroughly washed upon leaving the work area. Good personal hygiene is imperative.
- Immediately repair or replace any defective PPE.
- Prescription drugs must not be taken by personnel unless specifically approved by a qualified physician.
- Personnel on site must use the buddy system; visual contact must be maintained between team members at all times.
- Report any unsafe conditions and accidents immediately to the SHSO.

9.1.2 Daily Start-up and Shutdown Procedures

The following protocols will be followed daily prior to start of work activities:

- The SHSO will review site conditions to determine if modification of work and safety plans are needed.
- Personnel will be briefed and updated on any new health and safety procedures as well as emergency information.
- All safety equipment will be checked for proper function.
- The SHSO will ensure that first aid equipment is readily available.
- The SHSO will initiate appropriate monitoring.

The following protocol will be followed at the end of daily operations and before breaks:

- All personnel will proceed through decontamination procedures and facilities, as appropriate.

9.2 Confined Space Entry

Confined space entry will be prohibited during this project.

9.3 Tanks, Drums, and Barrels

It is possible that buried tanks, drums, or barrels could be discovered. However, should the field investigations discover or detect unknown tanks, drums, barrels or other containers that are suspected of containing hazardous waste, the following procedures will be followed. Field personnel should mark this location with flagging tape or some similar means and should also mark this location on the site plans. Field personnel should not stay in the immediate area (100-foot radius) any longer than is needed to flag the location of the discovered object. Tanks, drums, and barrels are to be left undisturbed until an action plan and an addendum to the HASP have been approved by the SPM, the CHSD, the SHSO, and the appropriate USAEC representative. If a spill absorbent/containment materials are available, and it is safe to do so, deploy them accordingly.

9.4 Respiratory Protective Equipment

The following is a list of general provisions regarding the use of respiratory protective equipment. Authorized respirator users must have completed 40-hour (and/or 8-hour refresher) HAZWOPER training, since respiratory protection training (per 29 CFR 1910.134) is an integral part of this training program.

- Only properly cleaned, inspected and maintained, NIOSH/MSHA approved respirators shall be used on site.
- Selection of respirators as well as any decisions regarding upgrading or downgrading of respiratory protection will be made by the SHSO.
- Air purifying cartridges shall be replaced when "loadup" or "breakthrough" occurs, unless otherwise recommended by the SHSO.
- Only employees who have had pre-issue and annual qualitative fit tests thereafter, shall be allowed to work in atmospheres where respirators are required.
- If an employee has demonstrated difficulty in breathing during the fitting test or during use, he or she shall have their physical condition re-evaluated to determine whether the employee can wear a respirator while performing the required duty.
- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of respirator.
- Contact lenses are not permitted on site and are not to be worn while using any type of respiratory protection.
- If needed, air supplied respirators shall be assembled per manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc.

- All air utilized for air supplied respirators will meet the requirements for at least Grade D breathing as specified by the Compressed Gas Association.
- Excessive facial hair (e.g., beards and large moustaches) prohibits proper face fit and effectiveness of air purifying respirators. Persons required to wear respiratory protection must not have any facial hair that interferes with the respirator seal.
- Regular eyeglasses cannot be worn with full face respirators (breaks the facepiece seal). Special eyeglass inserts must be utilized.
- The respiratory protection utilized on site will be in compliance with OSHA in 29 CFR 1910.134 and the Analysas Corporation Respiratory Protection Program.
- Respirators are to be cleaned daily per 1910.134. If respirators are not dedicated to individuals, disinfection is also required.
- Where air-purifying respirators are designated for protection against on-site contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance is detected.

9.5 Illumination

All on-site activities are to be conducted during daylight hours. If work conditions change activities shall be conducted in accordance with the provisions of 29 CFR 1910.120(m), Table H-102.1 (e.g., 5 foot candles [general site areas] to 30 foot candles [offices]).

10.0 EMERGENCY PREPAREDNESS AND CONTINGENCY PLANS

On-site emergencies will ultimately be handled by installation emergency support personnel. The initial aspects of an emergency response and first-aid treatment, however, will only be performed by qualified Analysas Corporation personnel.

10.1 Emergency Contacts and Notifications

The name and phone numbers of all personnel and agencies that could be involved in emergency response will be posted by the telephone in the field office. The following phone list contains the agencies and individuals to be notified in an emergency.

Fire

Post Fire Department

(301) 677-2117 (Fire/HazMat Response)

(301) 677-4735 (Non-emergency)

Police

Provost Marshal's Office

(301) 677-5083

Military Police

(301) 677-6622

Ambulance/Hospital

Kimbrough Army Hospital

(301) 677-8570

Other Important Numbers

Fort Meade EOD Unit

(301) 677-9770 [Off Hours (301) 621-7289]

Fort Meade Environmental Management Office

(301) 677-9648/9549, Sara Gracey, Bill Harmeyer

USAEC Contracting Officer/Representative

(410) 671-1607 Scott Hill

(410) 671-1612 Todd Beckwith

USAEC Environmental, Health, and Safety Office

(410) 671-4811

Maryland Department of the Environment/DNR Police
(410) 974-3551

USEPA Region III, Oil and Hazardous Material Spills
(215) 597-9800

NSA Range Control
(301) 688-4776

Analysas Corporation
(301)589-2100 Silver Spring, MD office Alison Doherty/Peter Mattejat
(615) 576-0837 Oak Ridge, Tennessee Sid McNair, CHSD

Written directions from the various work sites to the hospital are provided in Table 10-1. A map will be posted on site that indicates the location of the base hospital (Kimbrough Army Hospital) with respect to the various site work areas. Exhibit 10-1 shows the routes.

10.1.1 Site Personnel Responsibilities

The minimum requirements of an individual during an emergency situation are to know the following about his or her work area:

- The location of site emergency exit routes.
- The location of the nearest fire alarm pull box and fire extinguisher. Fire extinguishers should only be used by personnel who know how to operate them safely, in addition to knowing the type of fire (e.g., electrical, petroleum product, wood) and the appropriate type of fire extinguisher to be used under the existing conditions.
- The location of other emergency equipment such as first aid kits, stretchers, emergency self-contained breathing apparatus, eye wash stations, emergency showers, and spill kits or other spill containment supplies and equipment.
- The location of the nearest telephone or other means of communication such as radio or cellular telephone.

10.1.2 Reporting An Emergency

10.1.2.1 Large-Scale Incidents

In the event of an environmental incident, installation emergency response personnel at the Post Fire Department shall be notified immediately. If UXO or chemical agents are discovered, immediately contact the 144th Explosive Ordnance Disposal (EOD) Unit (Fort Meade) at (410) 677-5770. Initial evacuation of the area in question should be accomplished by the Field Supervisor and the SHSO. Additionally, the SHSO, CHSD, and the USAEC Safety Officer should be notified as soon as possible. Emergency first aid shall be applied onsite as deemed necessary. The injured/ill individual will then be decontaminated (if necessary) and transported to the base hospital, if needed. The hospital ambulance personnel will be contacted for transport as necessary in an emergency,

10.1.2.2 Accidents, Injuries, Illnesses

In the event of an accident involving personal injury or illness, the SHSO or Field Supervisor will contact the base hospital immediately. The SHSO or the Field Supervisor will arrange for administration of appropriate first aid, and arrange transportation for injured personnel to the hospital. The SHSO will evaluate the site conditions to determine if the causal hazard still exists. Site personnel shall not reenter the Exclusion Zone until the cause of the injury is determined and the Exclusion Zone is designated safe to re-enter by the SHSO.

As soon as practical after an emergency response, the SHSO or the Field Supervisor shall brief the Task Manager, as to the nature of the incident and response actions taken. The SHSO shall evaluate the site conditions and make a determination regarding any measures that could not be taken to prevent incidents of this nature from being repeated.

Table 10-1 lists the directions for the emergency routes from HHA, FTA, and ODA. Figure 10-1 shows the emergency routes for HHA, FTA, and ODA.

Table 10-1 Site-Specific Directions to Kimbrough Army Hospital

Helicopter Hangar Area and Fire Training Area	Airfield Rd. to O'Brian Rd. Left on O'Brian Rd. to Mapes Rd. Right on Mapes Rd. to Ernie Pyle Rd. Right on Ernie Pyle Rd. Hospital at intersection of Ernie Pyle and Llewellyn Ave.
Ordnance Demolition Area	Wildlife Loop to Contact Station for Patuxent Wildlife Center From Station follow access road to Rt 198 Right at Rt 198 to Route 32 Right at Rt 32 to Ft Meade entrance, Mapes Road Left at Mapes Road to Ernie Pyle Rd. Right on Ernie Pyle Rd. Hospital at intersection of Ernie Pyle and Llewellyn Ave.

All incidents shall be reported on the appropriate Analysas Corporation Accident Investigation Report form. The Field Supervisor must ensure that a copy of the Accident Investigation Report is submitted to the Washington, DC office within 24 hours of the incident.

Accidents/incidents resulting in a fatality, lost-time injury or illness, hospitalization of five or more personnel, or property damage to government or contractor property (which occurred during the performance of the contract) equal to or exceeding \$2,000.00 must be telephonically reported to USAEC, SES Branch, (410) 671-4811, as soon as possible, but not later than two hours after occurrence and reported in writing within five days of occurrence on DA Form 285. All other accidents/incidents must be telephonically reported to USAEC, SES Branch, (410) 671-4811, within eight hours of occurrence.

Upon discovering an emergency situation, an individual must immediately take action to initiate emergency response activities. This involves the individual first removing themselves from immediate danger, then notifying the SHSO of the emergency situation so that the emergency response system can be activated.

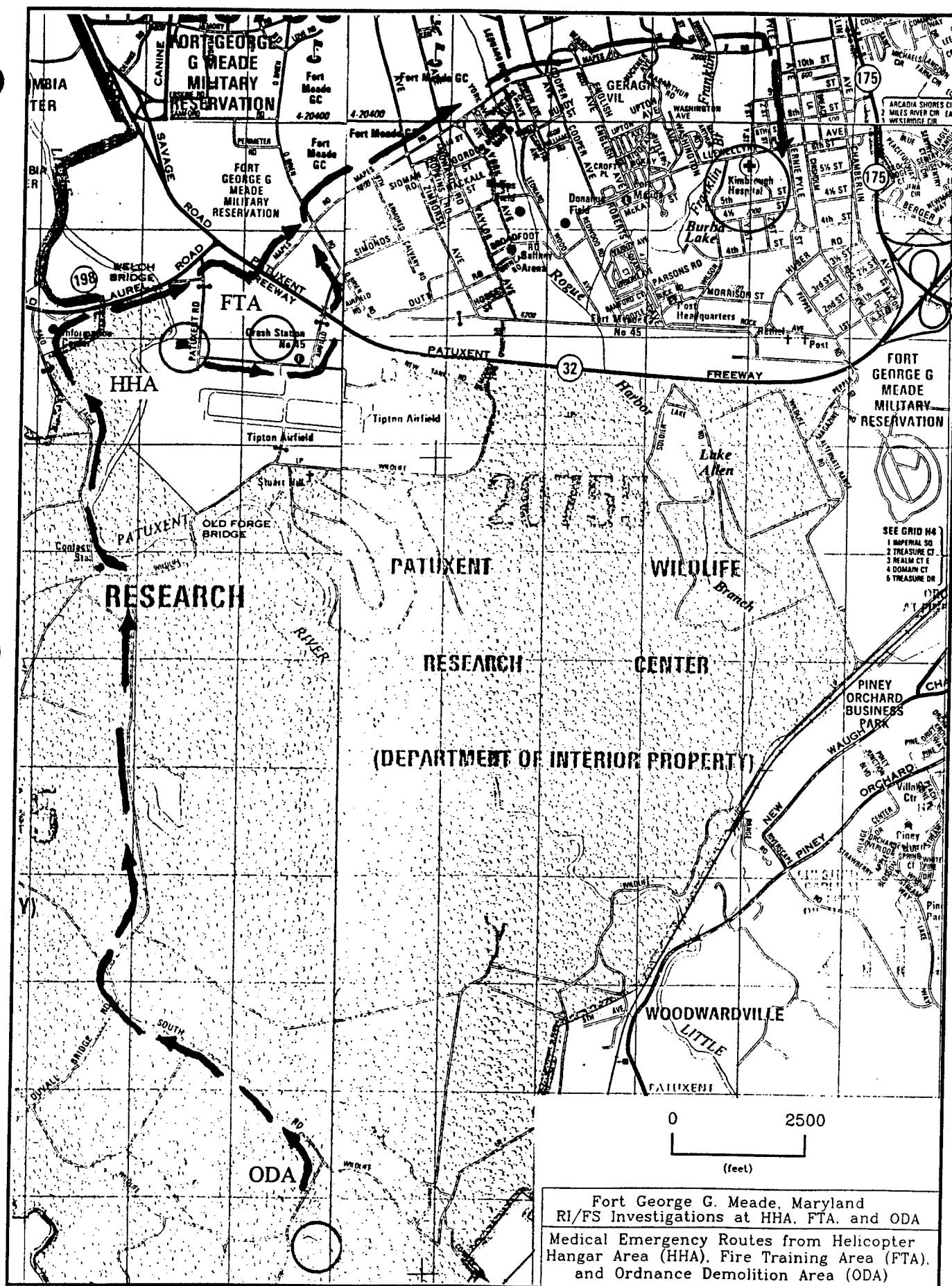


Figure 10-1

10.1.3 Summoning Assistance by Telephone

1. The USAEC plant telephone system can be used to initiate emergency response actions.
3. Once the appropriate USAEC official has been contacted, the following information should be given over the telephone before the caller hangs up:
 - a. A description of the type of emergency.
 - b. The location of the emergency.
 - c. The identity and location of the caller reporting the emergency.
 - d. When personnel have been injured, tell whether an ambulance may be needed.
4. Before ending the conversation, the caller should listen for any instructions and answer any questions the USAEC official may have. The USAEC official should be the party that ends the communication.

10.1.4 Emergency Coordinator

In the event of an emergency situation, the SHSO will act as the site emergency coordinator. Upon the arrival of appropriate emergency support staff (e.g., the Fire Department, the EOD Unit, etc.), the SHSO will relinquish authority to the incident commander of the support staff.

10.1.5 Emergency Actions for Site Personnel

The immediate and appropriate actions required of an individual during an emergency situation are the following:

1. Summon help immediately by reporting the emergency to the SHSO or other authority.
2. Bring the emergency under control, if this can be done safely.
3. Contact the local area or building emergency supervisor.
4. Sound the area, building, or facility evacuation alarm, as warranted.
5. Meet and orient emergency response units.

10.2 EMERGENCY ACTION PLANS

10.2.1 Emergency Alarm Systems

It is the responsibility of any site personnel during an emergency situation to activate appropriate emergency alarm systems when applicable during an emergency, such as site evacuation and fire alarms, or when necessary, facility-wide alarms.

10.2.1.5 All Clear Signal

The all clear signal is an announcement that indicates that it is safe for personnel to return to work areas and resume normal activities.

10.2.2 Emergency Assembly Points

An emergency assembly point shall be designated for each work project. The location of the assembly point shall be included in the pre-entry health and safety briefing or in a periodic health and safety briefing in the event that the location of the assembly point must be changed due to site activities.

10.2.3 Evacuation Routes

Based on the specific work area, the evacuation site will be chosen (i.e., based on wind direction, severity and type of incident) by the SHSO in concert with the Fort Meade emergency representatives and made known to all site workers during the daily pre-entry briefing.

In the event of an emergency that requires workers to evacuate the site or an area of the site, at least one of the following signals will be given -- verbal communication, communication via cellular phone or walkie-talkie, or three blasts on an air horn or vehicle horn. If there is imminent danger anyone may give the evacuation signal. When a site emergency occurs and the evacuation signal is given, the work will be shut down, and all employees will leave the work area. It is the responsibility of individuals to evacuate in a calm, controlled fashion. Use the evacuation route that affords the most direct route away from the site area while avoiding the emergency area. Any changes to suggested evacuation routes will require the SHSO to hold a Health and Safety Briefing to advise all site personnel of the change. An updated evacuation map will be posted at the field station and in other areas as appropriate.

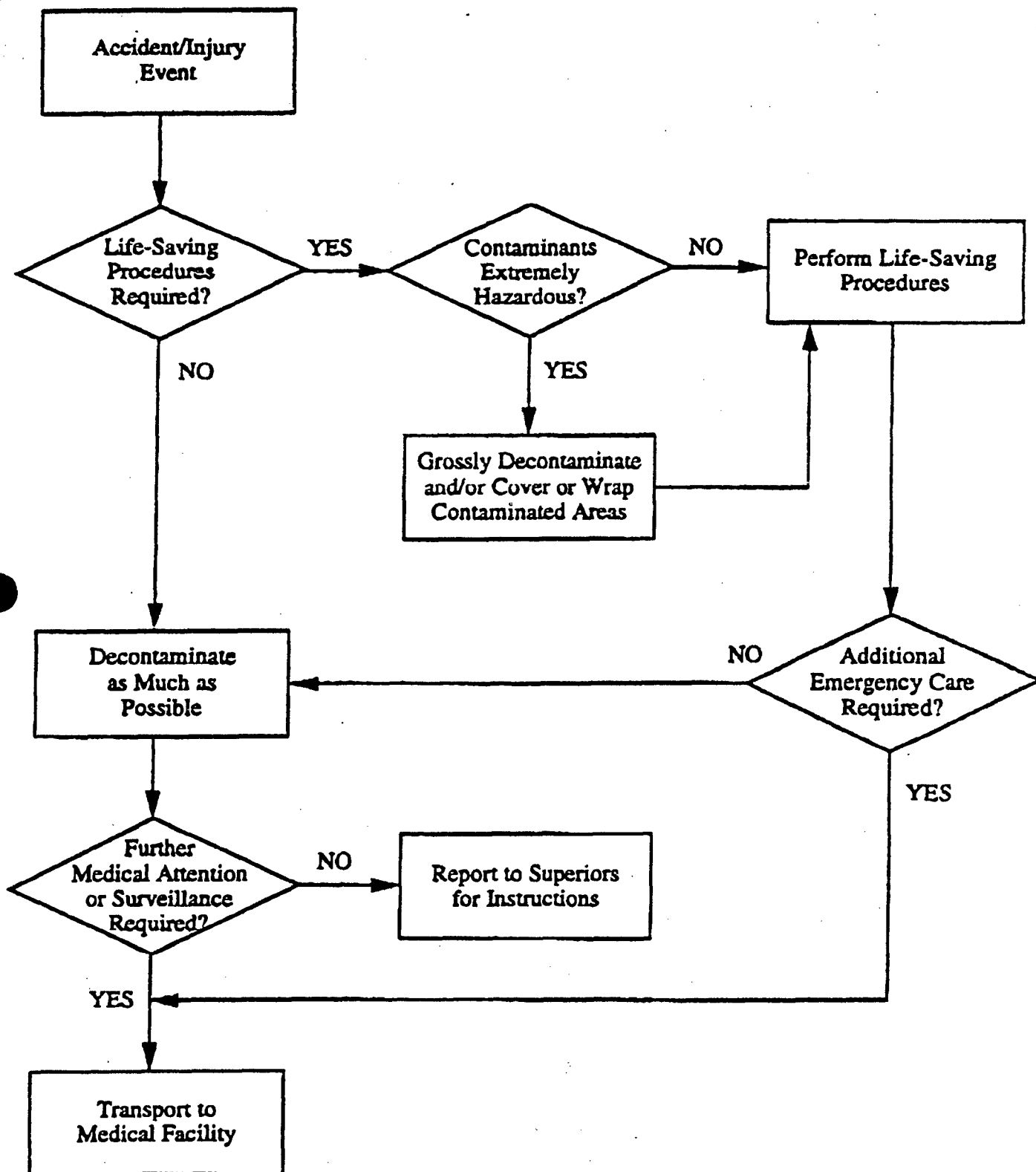
In case of emergency, evacuated employees may be decontaminated rapidly by removing exterior clothing. If a worker is critically injured in the Exclusion Zone, the worker may be removed immediately from the area; seek medical attention immediately. A decision aid for emergency decontamination is provided in Figure 10.2.

The Field Supervisor's log of on-site personnel will be used to ensure that all individuals are present (e.g., head count). If someone is missing, the SHSO will alert the appropriate emergency personnel listed below. Control of personnel at the rendezvous point is the responsibility of the Field Supervisor or his/her designated assistant.

Evacuation routes shall be established for all site operations. EZ evacuation routes shall be through the CRC, if possible. The SHSO shall designate the safest site operations evacuation route. The location of the route and the recommended progression shall be discussed in the pre-entry health and safety briefing. In the event of an evacuation, personnel responsibilities are as follows:

1. Personnel should be familiar with the safest and shortest evacuation route from each site and area in which they perform work.
2. When an evacuation alarm is sounded, personnel should quickly but calmly proceed to the area exit and to the designated assembly point to await further instructions from the SHSO or the incident commander.
3. If possible and practical, equipment should be shut down prior to exiting from the area.
4. Personnel should follow the instructions given by the SHSO, or emergency response team incident commander upon his or her arrival.

Figure 10-2 Decision Aid for Emergency Decontamination



5. Personnel should remain at the assembly point until otherwise instructed.

10.2.4 Fire or Explosion

Fires on site can be started by natural events, work activities, or the activities of others. In the event of a fire or explosion, the base fire department shall be immediately notified. All personnel shall move to a safe distance based on the severity of the fire. Fires shall not be fought by personnel if an explosion hazard is present. Personnel should not attempt to fight large fires at the site. In lieu of small fires that could possibly occur, multipurpose (ABC-rated) fire extinguishers shall be on hand at all times. Personnel have been previously instructed in the use of these fire extinguishers and will attempt control of only very small fires (e.g., ones requiring one extinguisher). The procedure for using a fire extinguisher is to pull the safety pin, point the extinguisher at the base of the flames, and discharge the extinguisher by sweeping the flames from a distance of about 6 feet. The extinguisher operator should move in as the flames are being put out. In the event of a larger or uncontrolled fire, all personnel will immediately evacuate the area and the Emergency Coordinator or the SHSO will notify and work with the base fire department.

10.2.5 Emergency Equipment

Select pieces of equipment will be provided by Analysas Corporation. Emergency equipment for the Exclusion Zone will be kept in the Contamination Reduction Zone or the Support Zone. At a minimum, the equipment must include:

- Portable emergency eye wash system(s)
- Multipurpose (ABC-rated) fire extinguishers
- Adequately stocked first-aid kits
- Air horns
- Mini-spill containment kits

10.3 Emergency Medical Services

10.3.1 Personnel Injuries

All injuries to site personnel, regardless how minor, must be reported to the SHSO. First aid will be rendered by the designated SHSO, as necessary, and transportation by the Emergency Medical Services (EMS) will be made at the discretion of the SHSO, or at the injured person's request. All site injuries and the circumstances involved will be recorded in the project logbook by the SHSO. The completion of state Worker Compensation forms will be coordinated with the injured person, the person's supervisor, the SHSO, and the SPM.

10.3.2 First Aid and CPR

At least one person shall be designated to perform first aid and Cardiopulmonary Resuscitation (CPR) in the event of emergency conditions during site operations. The designated person shall be a person trained in CPR and first aid procedures and shall be informed of Analysas Corporation procedures for blood-borne pathogens.

10.3.3 Blood-borne Pathogens

All site activities will be conducted in accordance with established procedures for the control of blood-borne pathogens and with the requirements of 29 CFR 1910.1030. Personnel designated to perform first aid shall be made aware of the requirements of the procedures and informed how to control and prevent exposures to blood-borne pathogens.

10.3.4 Emergency Medical Services

First aid treatment and emergency CPR will be performed by the SHSO. All work related injuries will be treated by the Kimbrough Army Hospital.

10.3.5 Transportation

Emergency transportation of site personnel to receive medical attention or emergency decontamination will be provided through the USAEC emergency services office.

10.4 Emergency Response

All emergency response activities shall be performed by personnel trained according to the requirements of 29 CFR 1910.120.

10.5 Spill Containment

In case of a hazardous materials emergency, the Project Field Supervisor will assume full control and direction of the emergency as the Emergency Coordinator. The Emergency Coordinator will work with the SHSO to identify and evaluate the hazards. All emergency responders and communications will be coordinated and controlled through the Emergency Coordinator. When installation emergency response personnel arrive on site, the Emergency Coordinator shall brief responding installation personnel (e.g., fire department) and relinquish control of the scene to the chief or designated Incident Commander.

The project staff will not be organized as a formal Emergency Response Team per HAZWOPER and will only perform defensive containment measures and activities that do not pose a threat to their own health and safety (e.g., incidental releases only). Situations that pose a serious threat to the public health or the environment will be dealt with by notifying the Fort Meade Post Fire Department, the USAEC Environmental Health and Safety Office, the Analysas Corporation CHSD, and the appropriate state and local authorities. All spills, regardless of size, should be reported to the SHSO.

11.0 REFERENCES

Code of Federal Regulations, Title 29, Part 1910, Office of the Federal Register, National Archives and Records Administration, 1992.

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