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FINAL SITE HEALTH AND SAFETY ACTION PLAN FOR LOW LEVEL RADIOACTIVE WASTE BURIAL SITE NAS FORT WORTH TX

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NAVAL AIR STATION FORT WORTH JRB CARSWELL FIELD TEXAS

ADMINISTRATIVE RECORD COVER SHEET

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UNITED STATES AIR FORCE

INSTALLATION RESTORATION PROGRAM

FINAL
SITE HEALTH AND SAFETY PLAN

INTERIM REMEDIAL ACTION
LOW-LEVEL RADIOACTIVE WASTE
BURIAL SITE

CARSWELL AIR FORCE BASE, TEXAS

April 1996

UNITED STATES AIR FORCE
INSTALLATION RESTORATION PROGRAM

FINAL SITE HEALTH AND SAFETY PLAN

INTERIM REMDIAL ACTION
LOW-LEVEL RADIOACTIVE WASTE BURIAL SITE

Carswell Air Force Base, Texas

April 1996

Prepared for:

Air Force Center for Environmental Excellence
Base Closure Restoration Division (AFCEE/ERB)
3207 North Road
Brooks Air Force Base, Texas 78235-5363
Contract #F41624-92-D-8002
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This Site Health and Safety Plan has been prepared to support environmental restoration efforts under the Air Force Center for Environmental Excellence Installation Restoration Program as described in contract Statement of Work for removal/disposal and site restoration of solid waste management unit 60 (SWMU-60) to include associated soil at Carswell AFB, TX, 26 March 96.

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APPENDICES

1.0 INTRODUCTION

1.1 General

Under a contract with the Air Force Center for Environmental Excellence (AFCEE), Brooks AFB, Texas, the Contractor has been issued a delivery order to remove and dispose of low level radioactive wastes (LLRW) and affected soils buried at SWMU 60 at Carswell AFB in Fort Worth, Texas. Figure 1-1 is a location map for Carswell AFB. Figures 1-2 shows the site location for SWMU 60.

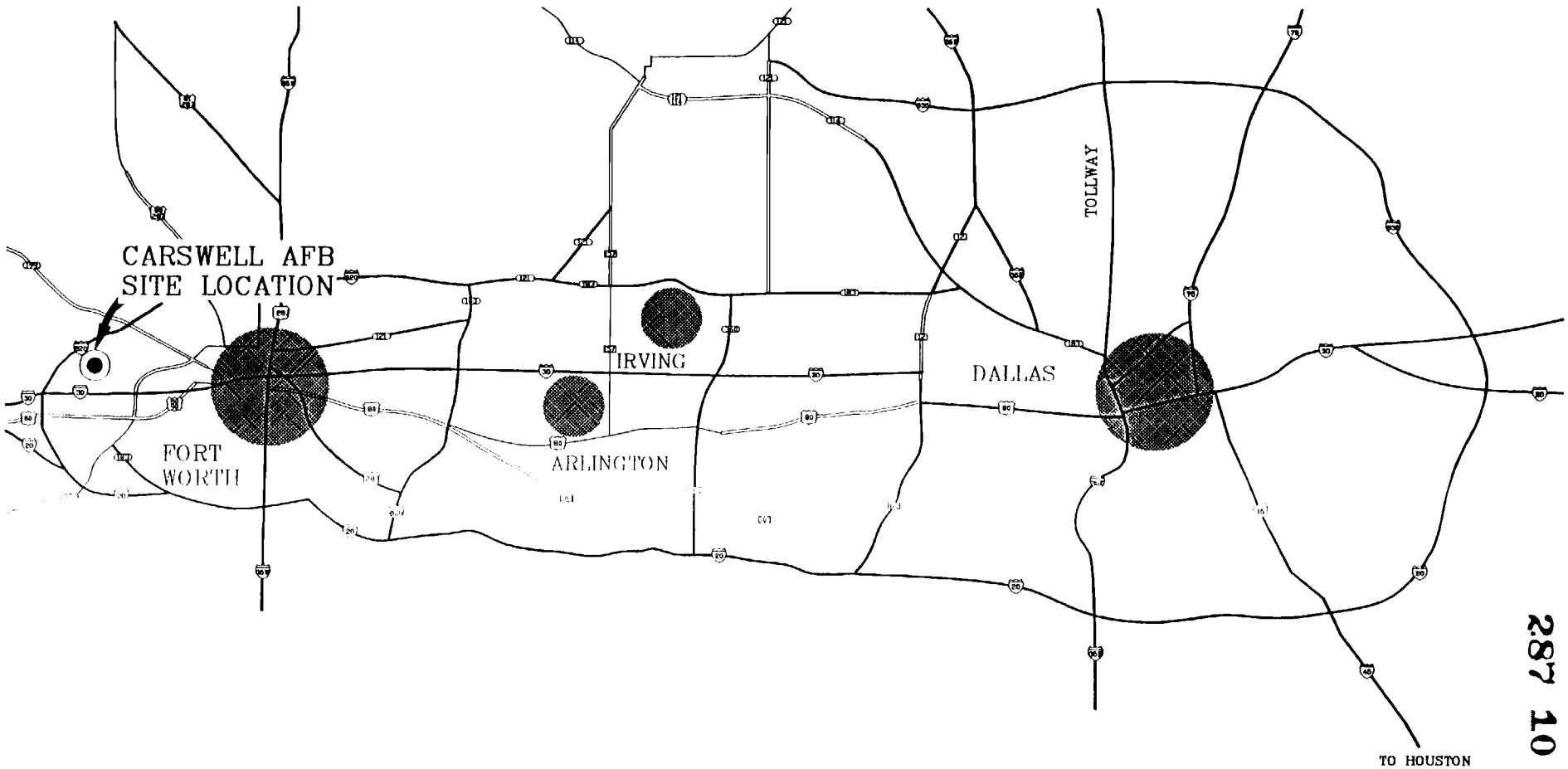
The work plans for this project include the Health and Safety Plan (HSP), the Remedial Action Plan (RAP), and the Sampling and Analysis Plan (SAP). This HSP covers topics such as personal protective equipment, decontamination, emergency procedures, and other related health and safety issues. The RAP describes the waste and soil excavation, transportation and disposal activities. The SAP consists of two sections, the Quality Assurance Project Plan (QAPP) and the Field Sampling Plan (FSP). The SAP describes the sampling, analytical, and quality assurance/quality control activities for both the laboratory and the field.

1.2 Site Background - SWMU 60

SWMU 60 is located five miles west of Carswell AFB at the Off-Site Weapons Storage Area. A chain-link fence approximately 10 feet by 20 feet encompasses the site which contains three buried tubes. Based upon "as-built" drawings provided by the Air Force, the tubes are constructed of cast iron with a diameter of 12 inches and extend approximately 12 inches above the ground surface. The length of each tube is 18 feet, thus extending approximately 17 feet in depth below the ground surface. The bottom end of each tube was capped with a cast iron plug and lead caulk. At the surface, each tube was closed with a welded steel cap set over the top. Each tube is surrounded by approximately 3 inches of grout. The LLRW consisting of radium-painted aircraft instrument dials was disposed of in the tubes according to rules and practices acceptable at the time of construction. Based on visual inspection by Air Force representatives, no evidence of any release of hazardous constituents to the environment has occurred.

1.3 Purpose And Scope

This HSP prescribes basic procedural and minimum equipment requirements for worker protection for the Contractor, subcontractors, clients and authorized visitors who enter the work areas. This HSP describes minimum requirements in accordance with OSHA 29CFR1910 and 1926. Each



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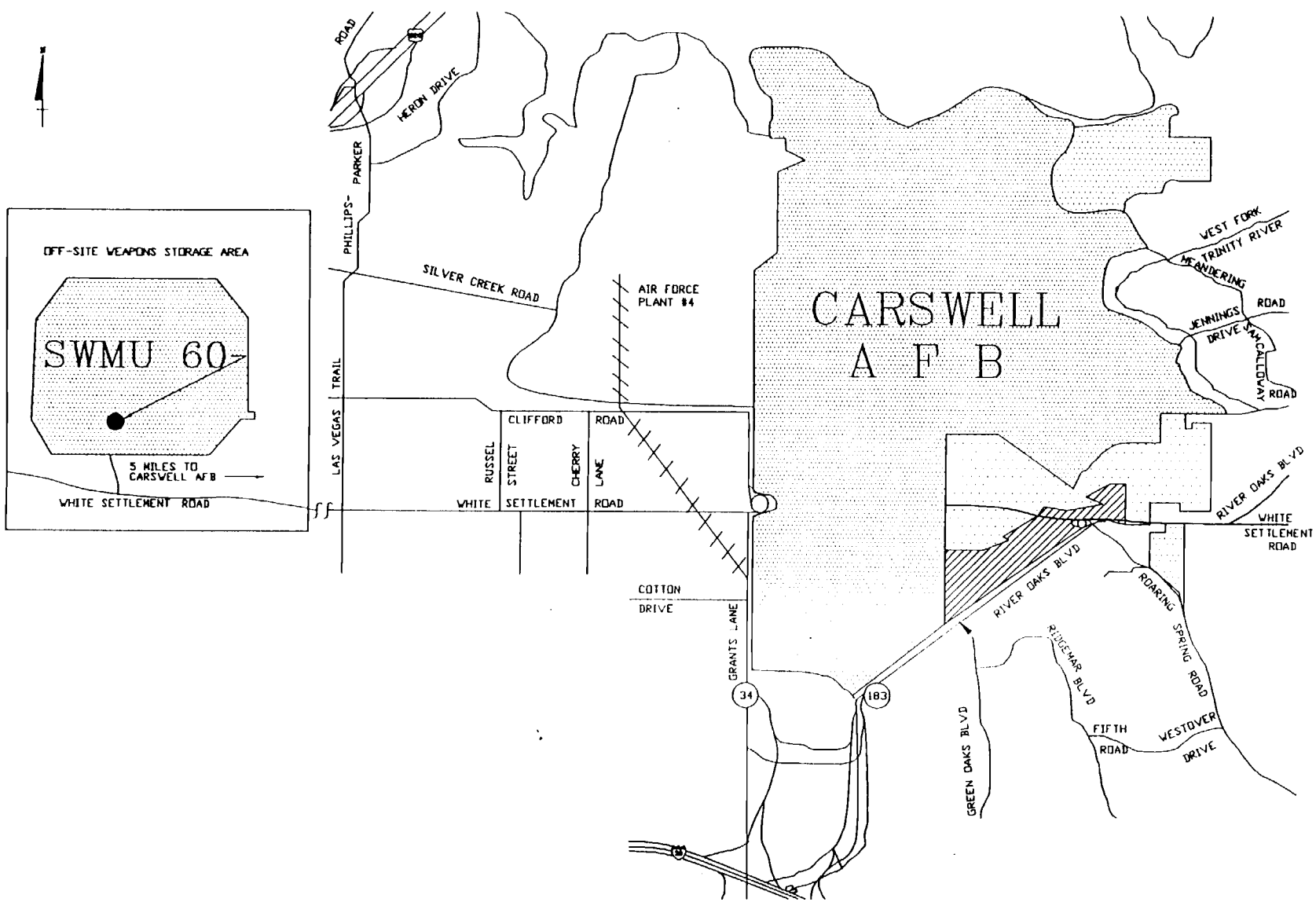
DAP	SCALE: NTS	LOCATION MAP CARSWELL AFB, TEXAS FIGURE 1-1	JOB NO. 816021 FILE NO. FIG-2 DWG NO.
10/94			
DJS			
MJT			



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DRAWN DAP	SCALE: NTS	SWMU 60 SITE LOCATION MAP CARSWELL AFB, TEXAS FIGURE 1-2	JOB NO. 816021 FILE NO. FIG-4 DWG. NO.
DATE 10/94			
ENGINEER DJS			
APPROVED MJT			

subcontractor is responsible for the health and safety of their employees and for compliance with applicable OSHA regulations.

Copies of the HSP and any modifications must be retained on-site by the Site Health and Safety Officer (SSO) as part of the site-specific health and safety plan. The HSP and any amendments to the HSP must be reviewed and approved by the Contractor's Project Manager and Regional Health and Safety Coordinator (RHSC) prior to issuance. The Health & Safety Plan Approval Sheet and the Site Safety Plan Amendment Form shall be completed by the Contractor's Project Manager and RHSC and retained on-site by the SSO. Appendix A contains the Health and Safety Plan Approval sheet. Appendix B contains the Site Safety Plan Amendment Form.

The Contractor's employees, its subcontractors, site visitors, and other authorized personnel who enter the work area are subject to the provisions of this HSP. During the execution of the work, restricted work areas (exclusion and contamination reduction zones) will be established. Personnel who are assigned work within or plan to enter the restricted work areas must read and review with the SSO the HSP and verify through signature that they are familiar with its provisions. Unauthorized personnel are not permitted in the restricted work zones. The Base Radiation Officer will be allowed full access to the site.

During development of this plan, consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, the health effects and exposure guidelines/limits for potential contaminants, and procedures designed to protect against the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29CFR1900-1910 and 1926,
- The Handbook to Support the Installation Restoration Program (IRP) Statement of Work (SOW), May 1991,
- OSHA/NIOSH/EPA/USCG Occupational Health and Safety Guidance Manual for Hazardous Waste Site Activities,
- NIOSH Pocket Guide to Chemical Hazards.
- Air Force Manual 88-15, Criteria and Standards for Air Force Construction.
- USEPA Standard Operating Safety Guidelines.

- Air Force Instruction 40-201 - "Managed Radioactive Materials in the Air Force", July 1994.

2.0 HAZARD ANALYSIS

2.1 Description of Site Tasks

The following is a list of the tasks to be conducted for this LLRW removal project:

(1) Excavation, stockpiling, and sampling of soils/wastes;

(2) Removal and overpacking of tubes;

(3) Installation of soil borings and collection of soil samples;

(4) Transportation of soils/wastes to disposal locations;

(5) Site backfilling/restoration.

2.2 Site Hazards Overview

The primary hazard at these sites is exposure to Radium-226 that was applied to dial faces in a paint formulation. The presence of radium in the paint caused the dial face to glow in the dark. The radium mixed with the paint was a mixture of stable and radioactive isotopes (all naturally occurring) of radium which was refined in high concentration from relatively low concentrations in soil and rock. Radium is formed as the byproduct of the uranium decay chain and of the thorium decay chain. Radium-226 from the uranium chain is the primary hazard expected, thorium is not expected.

Some of the radiation from radium is constantly being released into the environment. It is this release of radiation that causes concern about the safety of radium and all other radioactive substances. Each radioactive isotope of radium releases radiation at its own rate. For example, Radium-224 releases half its radiation in about 3.5 days, while Radium 226 releases half its radiation in about 1,600 years. When radium decays, it divides into two parts: the emitted radiation is one part, and a "daughter" isotope is the second part. The daughter, like radium, is unstable and radioactive; it also divides into radiation and another daughter. The dividing continues until a stable, non-radioactive daughter is formed. During these decay processes, alpha, beta, and gamma radiations are released. These emissions may be harmful if contaminated soil is ingested or inhaled, or if external exposure to high concentrations of radium were to occur. However, with respect to this site and the concentrations of radium present in dial paint, external exposure to this radium is likely to be very low.

Listed below is a brief site hazard overview:

Apparent Hazard:		Type of Facility:		Status of Facility:	
Serious	____	Imp.	____	Active	____
Moderate	X	Dump	X	Inactive	X
Low	____	Storage Tank	____	Unknown	____
None	____	Open	____		
Unknown	____	Enclosed	____		
		Other	____		

Waste Type(s):		Waste Characteristics:		Type/Form of Hazard:	
Gas	____	Toxic	____	Dust	X
Liquid	____	Corrosive	____	Liquid	____
Sludge	____	Ignitable	____	Fumes	____
Solid	X	Volatile	____	Vapors	X (potential)
Unknown	____	Radioactive	X	Contact	X
Other	____	Reactive	____	Other	____
		Unknown	____		
		Other	____		

The following subsections describe site work activities, potential hazard categories, and the corresponding procedures for hazard reduction. Personnel encountering a hazardous situation shall notify co-workers and the SSO or Site Manager.

2.3 Chemical and Radiological Hazards of Concern

According to historical information available on this site, no chemicals were disposed in the LLRW disposal area. Therefore, the only chemicals of concern are the radium that was present in dial face paint and metals that may have dissociated from the dials and from the dial paint as a result of deterioration. The metals are not expected to have deteriorated to the extent that soil concentrations would present a hazard through any pathway of exposure, therefore, hazards associated with exposure to these metals will not be discussed.

Radium is not expected to have dissociated from paint into soil at concentrations that would cause health effects if the contaminated soil were ingested or inhaled, or at concentrations that would constitute an external radiological hazard. However, occupational exposure to radionuclides should be kept to levels "As Low As Reasonably Achievable" (ALARA); therefore, radiation monitoring will be conducted during site activities to limit external exposure, and personal

protective equipment (PPE) will be used to prevent dermal contact with or inadvertent ingestion of contaminated soil. Additionally, a dust action level, based on inhalation of soil contaminated with radium, has been calculated. This dust action level is based on the derived air concentration (DAC) from 10 CFR 835, and a conservative assumption of radium concentrations that may be present in soil as a result of deterioration of the dials (soil radium concentration is assumed to be 15 pCi/gm). The general practice is to use 10% of the DAC as an action level. The type, frequency, and duration of the air monitoring is outlined in Section 7. Table 2.1 lists the potential chemical and radiological hazards of concern.

TABLE 2.1
POTENTIAL CHEMICAL AND RADIOLOGICAL HAZARDS OF CONCERN

Radionuclide	Exposure Limit (10% DAC) mCi/ml	Assumed Soil Concentration pCi/gm	Calculated Total Dust Action Level mg/m^3
Ra-226	3E-11	15	3000

2.4 Excavations

Hazards encountered during soil and waste excavation include exposure to airborne contaminants and radioactive contamination due to radium released during intrusive activities. To minimize the potential for exposure, airborne contaminants will be monitored using a direct reading vapor analyzer and alpha and beta/gamma instruments. When necessary, excavations will be allowed to ventilate prior to working in or around the excavations. Personal protective equipment will be used when necessary.

Excavations present many additional hazards particularly if personnel must enter the excavation to perform work such as sampling. Environmental sampling and other tasks shall be performed from an area outside the excavation without entering the excavation. If personnel must enter the excavation, the additional hazards outlined in the following paragraphs must be considered.

Personnel entering an excavation that is considered a confined space must follow the Confined Space Entry Program in Appendix C.

The sides of excavations present a cave-in hazard due to 1) absence of shoring, 2) misjudgment of stability, 3) defective shoring, and/or 4) undercut sides. Cave-ins could cause workers to be buried or crushed. If excavations are to be entered by personnel, this potential hazard shall be

minimized by providing adequate shoring or sloping of the sides of the excavation. The protective systems (shoring, sloping or benching) shall follow the requirements of OSHA 1926.652 Requirements for Protective Systems. Supervisory personnel shall regularly inspect excavations for changing conditions.

Physical hazards such as falling during access/egress from the excavation or while monitoring or dismounting equipment, or stumbling into an excavation need to be prevented. The potential for accidents shall be minimized by providing ramps or ladders to excavations to allow safe access and egress. In addition, adequate barriers shall be constructed around open excavations. Material removed from the excavations must be placed away from the edge of the excavation to prevent cave-ins and instability of the sidewalls.

To prevent worker overexertion, each worker must limit manual lifting to a weight that is within his capabilities. Mechanical hoists shall be used where needed and where practical.

Congested work areas result from too many workers or equipment in a small area. Congested work areas present a situation in which physical accidents are more likely to occur. Ample work room between workers will be maintained at all times.

2.5 Tube Removal

The tubes containing the LLRW will be handled in a manner to reduce the possibility of rupture of the container and release of the LLRW material. This will include the use of fabric slings and mechanical lifting equipment. The soil will be removed from around the containers to allow their inspection prior to their removal. The tubes will be monitored using a direct reading alpha and beta/gamma instruments and PID prior to removal and transportation. Section 7.0 outlines the frequency and type of monitoring equipment to be used during work.

2.6 Tube Monitoring and Overpacking for Shipment

The removed tubes containing the LLRW will be placed in the stockpile area for staging, monitoring and overpacking into PVC containers. The tubes will be inspected for any holes or leaks and monitored by the Contractor's Radiation Safety Officer (RSO) for radioactivity and organic vapors. Personnel handling and monitoring the tubes will wear modified Level D PPE unless monitoring indicates that PPE should be upgraded. The tubes will be overpacked into PVC containers and shipped to U.S. Ecology for proper disposal.

2.7 Mechanical

Machinery that may be on-site includes drilling rigs, backhoes, excavators, and trucks. Only qualified operators will be allowed to operate the equipment. During operation of swing equipment such as excavators or backhoes, the swing radius will be communicated to other workers by the equipment operator to prevent employees from being struck by swinging machinery. Precautions will be taken to allow appropriate clearance (20 feet) for trees and electrical wires.

All motorized vehicles will be driven and ridden safely. Vehicles will not be overloaded with riders or supplies. Federal regulations require that seat belts be worn by all personnel when in vehicles. No one will be allowed to ride in the back of pickup trucks.

2.8 Traffic

The work areas will be cordoned off with high-visibility, "Caution: Do Not Enter" barricade tape.

2.9 Noise

Control of noise hazards will be in accordance with 29CFR1910.95. Hearing protection shall be worn in noise hazard areas. Noise hazard areas include operation of heavy equipment. The Contractor has a hearing conservation program in effect. The program requires the use of hearing protection for employees exposed to noise levels above 90 dBA.

2.10 Falling Objects

Hard hats must be worn by all personnel at all times. Personnel operating heavy equipment with sufficient Roll Over Protection (ROPs) may take the hard hat off, however when leaving the piece of equipment they must don their hard hat. The hat must be worn properly and not altered in any way that would lessen the degree of protection offered. All hard hats must meet ANSI Standard Z89.1, 1969. In addition, workers must not place tools or other materials near the edge of the excavation.

2.11 Subsurface Soil Sampling

Subsurface soil sampling is considered any soil sampling performed deeper than two feet from the surface. This soil sampling will be completed by using a drilling rig, power auger, or hydraulic excavator depending on the depth of sampling and the type of sample needed. Common hazards

associated with soil sampling include: contact with or inhalation of contaminants, back strain and muscle fatigue due to lifting, moving parts on the powered equipment, free or falling parts from the drill rig, high pressure hydraulic and air lines that may burst, overhead and underground utilities, and contact with or inhalation of decontamination solutions. Soil sampling shall be monitored using direct reading vapor analyzer and alpha and beta/gamma instruments. First aid equipment will be available based on Material Safety Data Sheet (MSDS) requirements. The MSDS sheets shall be located on-site. Appendix D contains a list of the MSDS sheets. The MSDS sheet shall be updated as new chemicals are brought on-site. Proper lifting techniques will be used when shoveling, auguring, and digging to decrease muscle strain. Hard hats, hearing protection, steel-toed boots, and gloves will be part of the PPE. The location of all utilities will be marked prior to drilling or excavation.

2.12 Surface and Equipment Contamination

Contact with contaminated surfaces, or surfaces suspected of being contaminated should be avoided. This includes walking through, kneeling, or placing equipment in puddles, mud, discolored surfaces, or on drums and other containers. Eating, smoking, drinking and/or activities which involve hand to face/mouth area are prohibited in the immediate work area(s). This reduces the likelihood of contamination by ingestion. Section 9.2 provides decontamination methods.

2.13 Fire Prevention

Fire prevention measures which will be followed include:

- Only approved Type III safety cans will be used to transport and store flammable liquids.
- All gasoline and diesel-driven engines requiring refueling will be shut down and allowed to cool before filling.
- Smoking is not allowed during any operations within the work area without a hot work permit.
- No open flame or spark is allowed within the work area.

2.14 Heat Stress

Heat stress control methods found in Appendix F shall be followed whenever ambient temperatures exceed 85°F.

3.0 KEY PERSONNEL AND RESPONSIBILITIES

The following is a summary of key personnel and their responsibilities.

Title	Name	Responsibilities
Project Manager	Mike Timmer	Coordinate all aspects of the project to ensure a safe and successful completion.
Site Manager	To Be Determined	Direct all site operations from the field to provide a safe and successful completion.
Site Health & Safety Officer (SSO)	To Be Determined	Act as site safety officer and enforce HSP.
Regional Health & Safety Coordinator (RHSC)	Steve Silverberg	Review field operation, site-specific trends, and approve the HSP for corporate and regulatory compliance.
Corporate Health & Safety Officer (CHSO)	Richard Renzi, C.I.H.	Audit field operations, prepare corporate health and safety policies and procedures, and review medical monitoring information for compliance.
Radiation Safety Officer (RSO)	To Be Determined	Provide LLRW safety training and radiological monitoring during all on-site activities.

4.0 SITE WORKER TRAINING

Personnel entering the exclusion and/or the contamination reduction zones shall have received training in accordance with OSHA 1910.120, including 40 hour initial Hazardous Waste Site Workers certification and 8-hour annual refresher training certification. Personnel shall also receive radioactive worker training from the RSO. This training will include: source of hazard, type of radiation hazard (alpha, gamma, beta), route of exposure, means of protection, acceptable doses, over-exposure systems, and type of monitoring.

4.1 Training and Briefing Topics

The SSO and RSO shall hold a Site Safety Orientation at the start of field operations to ensure that all provisions of the HSP are understood by the field workers. As part of the site orientation, each field worker will receive site specific radiation training for the expected radioactive elements. All personnel shall sign the Site Safety Plan Acknowledgment Form stating that they understand and shall abide by the requirements of the HSP. This form is located in Appendix G. The SSO and RSO shall hold additional training when new tasks start, as necessary, to ensure that all site personnel are informed of any changes in site specific health and safety issues. Daily tailgate safety meetings shall be held to discuss daily activities and hazards associated with the corresponding activities. The topics to be discussed at the various safety meetings briefing shall include, but not be limited to:

- Work tasks to be accomplished
- Coordination of activities to be conducted
- Identification of all hazards posed by the tasks to be conducted as well as by site conditions
- Level of protection required for performance of site tasks
- Safe work practices to be followed
- Communication procedures, i.e., hand signals, etc.
- Familiarization with the emergency plans for exposures, fire, etc.
- Concerns of the worker/health and safety problems identified.

4.2 Applicability of the Site Health and Safety Plan to Visitors

All visitors entering the work area are required to sign in at the site office and read and verify compliance with the provisions of the HSP prior to entering the work areas. In addition, visitors will be expected to comply with relevant training and medical surveillance. Visitors will also be expected to provide their own PPE.

In the event that a visitor does not adhere to the provisions of the HSP, he/she will be requested to leave the work area. If he/she fails to do so, all work shall stop and the Site Manager, SSO, RHSC and the Air Force site representative shall be notified. All non-conformance incidents shall be recorded in the site log.

5.0 MEDICAL SURVEILLANCE

5.1 Required Medical Monitoring

Prior to being assigned to site activities, site personnel performing activities under the OSHA 1910.120(f) regulations and entering the exclusion or contamination reduction zones shall participate in a medical surveillance program. At a minimum, this medical monitoring shall include:

- Complete medical and occupational histories
- Physical examination
- Pulmonary function tests
- Eye examination and visual acuity
- Audiometry
- Complete blood count
- Blood PCB
- Blood lead
- Urine screen for heavy metals
- Fasting SMA 12

The medical evaluation shall categorize employees as fit-for-duty and able to wear respiratory protection. Documentation is the responsibility of each employer. Each employee shall be able to provide proof of medical monitoring prior to commencement of work.

Medical monitoring shall also be provided to these individuals at the following times:

a. When employees have been injured, receive a health impairment, develop signs or symptoms which may have resulted from an exposure.

b. As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible over-exposure to hazardous substances, health hazards, or concentrations above OSHA permissible exposure limits (PEL).

c. As soon as possible following an emergency incident where personnel may have been exposed.

d. Whenever there is a loss of time due to injury or illness.

Equipment operators and drivers shall be required to meet DOT specified medical monitoring requirements.

5.2 Site-Specific Medical Monitoring

A 24-hour urine sample will be collected from each on-site worker prior to the start of work. These samples will be stored in a refrigerator. They will be analyzed as a baseline bioassay for radioisotopes only if an exposure incident occurs or is suspected. Other than this procedure, no site-specific medical monitoring tests will be performed for this project unless the scope of work changes or unforeseen circumstances arise. If changes do occur, the SSO will be in contact with the Regional and/or Corporate Health and Safety Officer and the Corporate Occupational Physician to determine if/what monitoring is needed.

6.0 PERSONNEL PROTECTION

This section describes the general requirements of the Environmental Protection Agency (EPA) designated levels of protection (A through D) and the specific levels of protection required for each task to be performed at Carswell AFB.

6.1 Definition of Levels of Protection

The individual components of protective clothing and equipment must be assembled into a full protective ensemble that protects the worker from site-specific hazards and minimizes the hazards and drawbacks of the PPE itself.

Level A: Should be worn when the hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin; or substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.

Level B: Should be worn when the type and atmospheric concentrations have been identified and require a high level of respiratory protection and moderate skin protection; or the atmosphere contains less than 19.5% or greater than 23.5% oxygen.

Level C: Should be worn when the atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect, or be absorbed through, any exposed skin; or the types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants.

Level D: Should be worn when the atmosphere contains no known hazard or work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

6.2 Levels of Protection Assigned to Tasks

At a minimum, the personal protective equipment shown in Table 6.1 shall be worn during LLRW removal activities and sampling activities.

TABLE 6.1
LEVELS OF PROTECTION ASSIGNED TO TASKS

Task	PPE
Background Soil Sampling	Level D
Excavation/Tube Removal	Modified Level D
Soil Sampling, Tube Monitoring/Sampling (external)	Modified Level D
Soil Boring Installation	Modified Level D
Site Backfill and Restoration	Level D

Level D PPE is the basic work uniform. Listed below is the PPE required.

Level D PPE

- Work clothes
- Work gloves
- Steel-toed, steel-shank boots or shoes
- Hard hat
- Safety Glasses with side shields
- Chemical splash goggles (where necessary)
- Ear plugs/muffs (during operation of heavy equipment).

Modified Level D PPE will be required when Level D PPE does not provide adequate operator protection. The upgrade shall be utilized when there is the possibility of exposure through dermal contact. Listed below is the PPE required.

Modified Level D PPE

- Work clothes
- Work gloves
- Chemical-resistant gloves (when sampling or handling tubes)
  - Outer: Nitrile (or similar)
  - Inner: N-DEX (or similar)

- Steel-toed, steel-shank boots or shoes
- Hard hat
- Safety glasses with side shields
- Chemical splash goggles (where necessary)
- Cool vests (as dictated by weather conditions)
- Ear plugs/muffs (during operation of heavy equipment).
- Tyvek disposable coveralls

Level C PPE will be required when modified Level D PPE does not provide adequate operator protection. The upgrade contingency will be based on air monitoring results as described in Section 7.

Level C PPE

- Tyvek disposable coveralls,
- Inner and outer chemical-resistant gloves,
  - Outer: Nitrile (or similar),
  - Inner: N-DEX (or similar),
- Hard hat,
- Chemical resistant, steel-toe, steel-shank work boots ,
- Full face air purifying respirator equipped with NIOSH/MSHA approved HEPA cartridges or canister for removal of organic vapors and toxic particulates,
- Cool vests (as dictated by weather conditions),
- Hearing protection (where required).

Level B PPE will be required when Level C PPE does not provide adequate operator protection. The upgrade contingency will be based on air monitoring results as described in Section 7.

Level B PPE

- Tyvek disposable coveralls,
- Inner and outer chemical-resistant gloves,
  - Outer: Nitrile (or similar),
  - Inner: N-DEX (or similar),
- Hard hat,
- Chemical resistant, steel-toe, steel-shank work boots ,
- Full face supplied-air respirator equipped with five minute escape pack,
- Cool vests (as dictated by weather conditions),

- Hearing protection (where required).

Level A PPE will not be required on-site.

6.3 Reassessment of Protection Program

The level of protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions or air monitoring. The SSO and RSO, in consultation with the RHSC, shall be responsible for deciding when and if an upgrade or downgrade in PPE is warranted.

When a significant change occurs, the protection program should be reassessed. Some indicators of the need for reassessment are:

- Change of season/weather
- When temperature extremes or individual medical considerations limit the effectiveness of PPE
- Contaminants other than those previously identified are encountered
- Change in ambient levels of contaminants

6.4 Standard Operating Procedures for Respiratory Protection Devices and Personal Protective Clothing

Standard operation, inspection, and maintenance procedures for air purifying respirators and personal protective clothing can be found in Appendix H of this plan.

6.5 Specific Levels of Respiratory Protection Planned for the Sites

All tasks described will be conducted in modified Level D or Level D PPE, using no respiratory protection, unless dust action levels described in Section 2.3 are exceeded. Instrumentation used for monitoring dust levels is described in Section 7.0. If dust action levels are exceeded, PPE will be upgraded to include required use of a full face respirator equipped with high efficiency particulate (HEPA) cartridges.

7.0 FREQUENCY AND TYPES OF MONITORING

Area and personnel monitoring will be completed and documented in accordance with 10 CFR 20, subpart L-Records. Personnel monitoring will, at a minimum, comply with the requirements set forth in 10 CFR 20, Subpart F-Surveys and Monitoring.

7.1 Area Monitoring

During excavation and soil and/or core sampling activities, direct readings will be taken using a Photoionization Device (PID), radiological monitoring equipment, and a Combustible Gas Indicator (CGI), if necessary. Direct readings will also be taken on the outside of the excavated tubes. The frequency of monitoring will be at the discretion of the SSO. Action levels can be found in Table 7.1. Equipment type, expected efficiency, lower detection limit, and monitoring application can be found in Table 7.2.

Intermediate volume air samples will be collected and analyzed on site using a portable scaler coupled with a ZnS detector with counting tray. Smears for alpha activity will be taken on dials to estimate initial radioactivity levels. These estimates will be provided to the analytical laboratory for their information. Action levels can be found in Table 7.1.

All monitoring results shall be recorded in the site log. The highest and average airborne concentrations shall be recorded in the daily record of hazardous waste field activity log located in Appendix I.

7.2 Personal Monitoring

All site workers will be required to wear a TLD badge which shall be placed at chest level. Workers will also perform a "self frisk" using an air proportional probe coupled with a ratemeter upon leaving the exclusion zone. Action levels can be found in Table 7.1. Equipment type, expected efficiency, lower detection limit, and monitoring application can be found in Table 7.2.

Instruments used for radiological screening will have current factory calibrations and will be function checked on a daily basis using a one microcurie CS-137 isotope check source with a traceable serial number. Background on each instrument will be established on a daily basis in an area known to be uncontaminated and on an uncontaminated medium similar to that which is to be monitored for contamination. An instrument control chart will be maintained for the portable counting system. All monitoring equipment shall be calibrated, operated and maintained according to the manufacturers specifications. Appendix J, contains a summary of these requirements.

TABLE 7.1
MONITORING METHODS

Instrument	Sampling Location	Monitoring Frequency	Action Level	Action
Ludlum Mod No. 3 & Model No. 44-2 Gamma Scintillater	Core, excavation, spoils, outside tubes, directly on dials.	At the discretion of the RSO.	Two times background.	Acquire a micro R meter and collect dose rates. Should dose rates exceed 2 mRem/hr, allow tubes to ventilate for 15 minutes. If elevated dose rates persist, limit time workers spend in this dose rate to 10 hours per day and post the area as a Radiation Area.
Ludlum Mod. No. 44-9 Ratemeter GM (Pancake) Detecter	A minimum of hand and foot frisk.	Upon leaving the exclusion zone	Any detectable activity	Initiate personnel decontamination procedure as specified in 9.2 of this plan.
Photo-ionization Detector (PID)	OBZ	Continuously during all activities	25 ppm above background for 1 minute in the breathing zone	Upgrade to Level C
Photo-ionization Detector (PID)	OBZ	Continuously during all activities	50 ppm above background for 1 minute in breathing zone	Evacuate site; notify Regional Health and Safety Coordinator
Combustible Gas Indicator with Oxygen Sensor (CGI)	Inside confined space, if applicable.	Continuously	10% of the LEL $<19.5\%$ O_2 $>23.5\%$ O_2	Ventilate confined space to achieve action levels or Evacuate Site; notify Regional Health and Safety Coordinator
Intermediate volume air sampler	In the work area at approximately chest level	Daily during work activities	Assumed soil concentration 15 pCi/gm. (Calculated Total Dust Action Level - 3000 mg/m^3)	Apply engineering controls. If unsuccessful, use respiratory protection

ppm = Parts per million

OBZ = Operator Breathing Zone

CRM = Count Rate Meter

LEL = Lower Explosion Limit

TABLE 7.2

SUMMARY OF
MONITORING EQUIPMENT, EFFICIENCIES, LOWER DETECTION LIMITS AND APPLICATIONS

Equipment	Expected Efficiency		Lower Limit of Detection	Application
Photovac HL 2000 Micro Tip	+/- 1% for 100 ppm isobutylene		0.1 ppm isobutylene	Used to monitor work zones to determine if contaminants are present.
MSA-261 Combustible Gas Indicator	Oxygen +/- 0.3% at constant temperature		1% oxygen	Used to monitor confined spaces and work areas for amount of oxygen or combustible gas.
	combustible gas	+/- 3% up to 50% full scale	0 - 100% lower explosive limit measurement	
		+/- 5% up to 100% full scale		
Ludlum Model 3	22% for PU-239		2.0mV input sensitivity	Used to frisk soils, equipment and personnel to determine if radioactive contamination is present.
Ludlum Model 44-9 ratemeter/ scaler Ludlum 44-2 (or equivalent) gamma scintillator (1 x 1 NaI) probe	900,000 cpm/mR/hr for Cs-137		60 KEV and up energy range	Used to frisk personnel to determine if radioactive contamination is present.
Eberline RAS-1 Intermediate Volume Air Sampling Pump	Not Applicable		Not Applicable	Used to sample airborne particulate matter which is collected on a filter cassette and filter is subsequently counted in the Ludlum Model 44-9 alpha sample counter.

8.0 SITE CONTROL

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

8.1 Buddy System

There will be no activities conducted on-site without sufficient backup personnel to permit operation of a buddy system. The buddy system is a method of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. Both employees shall be able to visually or verbally communicate with each other at all times and shall be equipped with the personal protective equipment required to assist the buddy in case of an emergency. At a minimum, two persons must be present at the site at all times.

8.2 Site Communications Plan

Successful communications between field workers and contact with emergency personnel is essential. At a minimum, the following communications systems will be available during activities on-site:

- Mobile/cellular telephone,
- Hand signals;

Signal	Definition
Hands clutching throat	Out of air/cannot breathe
Hands on top of head	Need assistance
Thumbs up	OK/I am alright/I understand
Thumbs down	No/negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

Visual or voice communications must be maintained at all times among field workers.

8.3 Work Zone Definitions

The three general zones regularly established at hazardous waste sites are the exclusion zone, contamination reduction zone, and support zone. These zonal designations are defined as follows:

Exclusion Zone

The exclusion zone (EZ) is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the exclusion zone requires the use of Level C personal protective equipment until a downgrade is allowed through acceptable air monitoring results.

Contamination Reduction Zone

The contamination reduction zone (CRZ) is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Support activities to be conducted in this zone will require modified Level D PPE.

Support Zone

The support zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

The EZ and the CRZ are restricted work zones. Access to the restricted work zones shall be limited to personnel having undergone the requisite training as specified in Section 4.0 and in compliance with the requisite medical surveillance program as specified in Section 5.0, and also having certified by signature that they have read, understand, and will abide by the HSP. Figure 1-1 depicts the location of the work zone for the LLRW removal projects at Carswell AFB.

A centralized temporary equipment staging area/decontamination station will be erected, and a support area will be established in the vicinity of the staging/decontamination area.

8.4 Site Security

The boundary of the exclusion zone and contamination reduction zone at the LLRW removal site will be cordoned off with high-visibility, "Caution: Do Not Enter" barricade tape to discourage access by unauthorized personnel.

8.5 Nearest Medical Assistance

In the event that medical treatment beyond first aid is required by site workers who may experience an injury or exposure on-site, the Cherry Lane Hospital will provide emergency care. The Cherry Lane Hospital is located east of Cherry Lane on Skyline Park in Fort Worth. Figure 8-1 illustrates the route to the hospital. The SSO will ensure that all site personnel are familiar with the routes to the hospital in the Site Safety Orientation. The following is a narrative description of directions to the Cherry Lane Hospital:

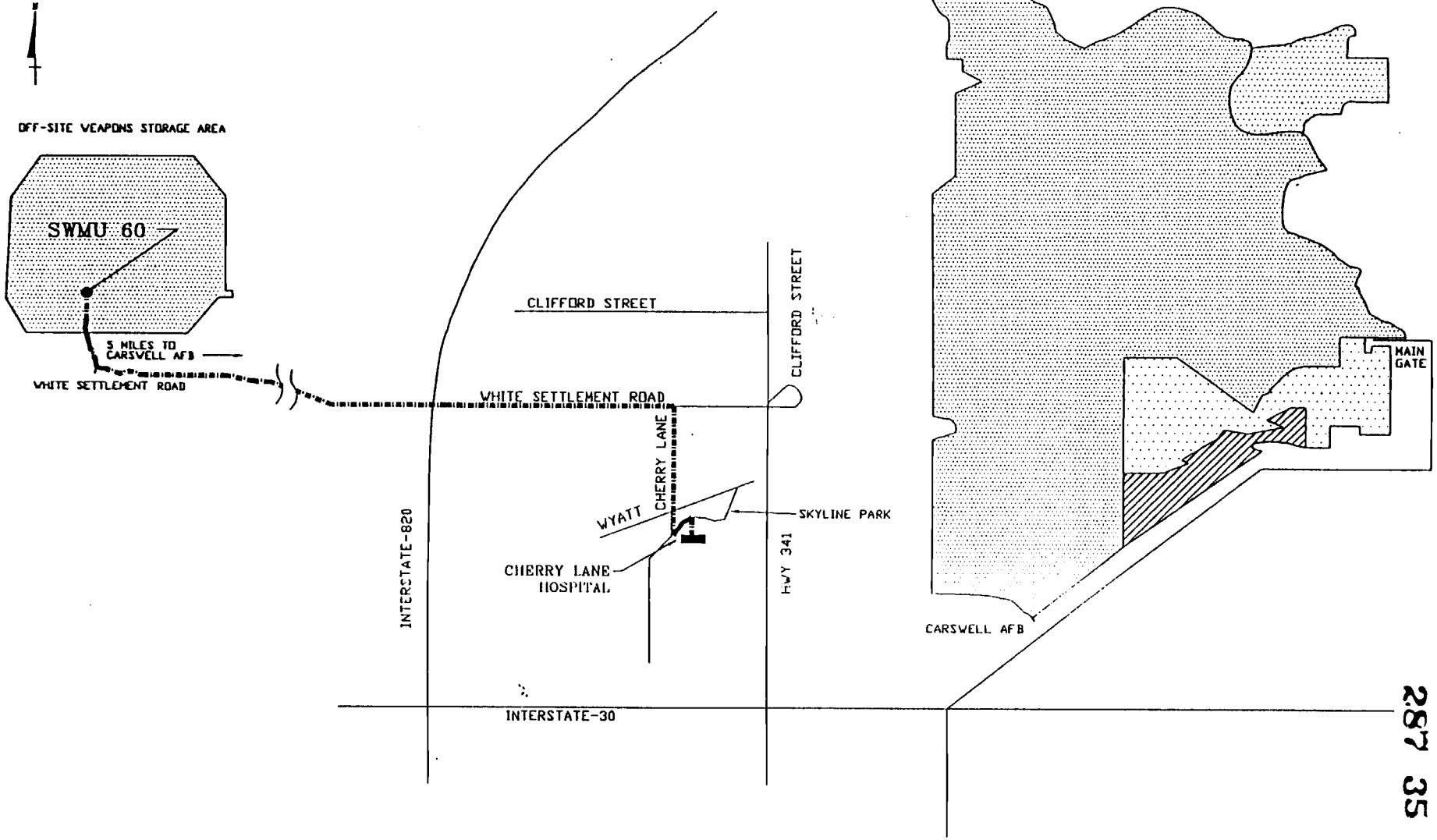
Proceed South out the main gate
Turn Right onto White Settlement Road
Go to Cherry Lane Road
Turn Right on Cherry Lane Road
Proceed on Cherry Lane Road to Sky Line Park
Turn left and then right into the Hospital

8.6 Safe Work Practices

The following general safety procedures shall be followed by all persons entering and/or working at the LLRW removal site:

- All persons working on this project shall read and sign this HSP prior to entering or working at the LLRW removal site. The master copy (with signature sheet) of this safety plan will be held by the designated SSO.

- At work sites where non Contractor employees may be exposed to hazardous chemicals which are used by Contractor personnel, the SSO shall inform the other employees of the methods to obtain a copy of the MSDS, precautionary measures that are necessary to protect employees, and the labeling system used at the work site. See Appendix D.



287 35

DRAWN	DAP
DATE	10/94
CHECKED	DJS
APPROVED	MJT

SCALE: NTS

ROUTE TO HOSPITAL
CARSWELL AFB, TEXAS
FIGURE 8-1

JOB NO. 816021
FILE NO. FIG8-2
DWG. NO. 1

- Smoking, eating, chewing gum, chewing tobacco, drinking, taking medicines, or activities which require hand to mouth/face actions shall only be allowed in designated areas outside the EZ and CRZ.

- All contractor or subcontractor personnel shall bring to the attention of the SSO any unsafe condition or practice associated with site activities.

- Hands, face and all other potentially contaminated areas shall be thoroughly cleaned prior to smoking, eating, or leaving the work zones.

- Project personnel must avoid unnecessary contamination exposure (e.g., walking through known or suspected "hot" zones or contaminated puddles, kneeling or sitting on the ground, leaning against potentially contaminated barrels or equipment).

- All personnel must sign-in at the site office prior to entering the work areas.

- All project personnel who are likely to wear air purifying or air supplied respirators must first meet the training and medical requirements of 29CFR1910.120 and 29CFR1910.134.

- Respiratory devices may not be worn with beards, long sideburns, or under other conditions that prevent a proper seal.

- No project personnel may be allowed on-site without the prior knowledge and consent of the designated SSO and Site Manager.

- All accidents and/or injuries shall be immediately reported to the SSO. If necessary, a first report of injury will be initiated by the SSO and provided to the Regional Health and Safety Officer for processing.

- All non-routine operations or amendments to this HSP shall be reviewed and approved by the Corporate Health and Safety Officer or Regional Health and Safety Coordinator and Project Manager prior to implementation.

- No matches or lighters may be brought into the exclusion or contamination reduction zones.

- Aerial obstructions such as power lines and tree branches will be verified prior to erection of crane rig masts or movement of large equipment. a 20-foot horizontal clearance must be maintained between all aerial obstructions.

- All vehicles must contain at a minimum, a Fire Extinguisher, First Aid Kit, the Route to Hospital, and an Emergency Telephone List.

- All outside site operations shall be performed during daylight hours.

- All confined space entries shall require either the SSO and/or RHSC to be present and shall be performed by personnel properly trained in confined space entry. The proper health and safety equipment for the entries shall be provided.

- When using portable electric tools and appliances use three-wire grounded extension cords and ground fault circuit interrupters to reduce the potential for electrical shock.

- All heavy equipment must have, as a minimum, backup alarm, fire extinguisher, ROPs protection and any necessary safety features.

SANITATION

- An adequate supply of potable water shall be available on-site. Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.

- Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

- Restroom facilities shall be made available at the hazardous waste site location.

9.0 DECONTAMINATION PLAN

9.1 Personnel Decontamination Procedures

The following decontamination procedure shall be followed whenever exiting the exclusion zones into the contamination reduction zones:

Station 1: Segregated Equipment Drop

- Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. All equipment and tools shall be monitored to determine if they are contaminated with radiation prior to cleaning. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool down station may be set up within this area.

Station 2: Boot and Glove Removal

- Scrub outer boot covers and gloves with brush and decon solution.

- Rinse off decon solution with water.

Station 3: Hard Hat/Eye Protection Removal Section

- Remove hard hat and eye protection. Wash and sanitize at least daily.

Station 4: Face Piece Removal

- If respirators are used, wipe down the respirator exterior with a wet paper towel, remove and deposit in plastic liner. Avoid touching face with fingers. Respirators shall be washed in a sanitizing solution, rinsed with potable water, and allowed to air dry at the end of each day.

- At the end of the decontamination train, workers should wash hands, face, and any other potentially contaminated areas with a potable water/mild soap solution followed by a potable water rinse. Personnel should shower and launder personal clothing as soon as possible upon completing daily activities.

- Upon completion of the personnel decontamination train, personnel skin shall be monitored to determine if radioactive contamination is noted. If contamination is present, repeat the washing of hands, face, and other areas suspected. The waste shall be managed as suspect radiological waste. A final test shall be completed on the affected area to ensure that decontamination has been successful.

9.2 Equipment Decontamination

Radiological release surveys will be performed on all tools and equipment prior to any decontamination activities. Release surveys will consist of a swipe survey and a direct reading survey. The removable release limit for radium is 20 dpm/100 cm^2 and 500 dpm/100 cm^2 total (fixed plus removable). If activities greater than these limits are encountered, a dry decontamination process will be used.

Equipment will be decontaminated in the following manner.

- First a "dry" decontamination area will be established. The dry decontamination area is used to decontaminate radioactively contaminated equipment. This area may be located where the drilling or excavation is taking place to minimize the potential for spreading contaminants from the site.

- Prior to decontamination, clean plastic sheeting shall be placed on the ground or inside the solids containment vessel to collect material removed from the equipment. Decontamination stations shall be located on the clean plastic sheeting and shall consist of mild soap wash, methanol rinse, and a final deionized rinse station. Waste materials shall be containerized and managed as suspect radiological waste.

- If contamination is potentially extensive or if environmental factors such as wind may cause uncontrolled dispersal of potentially contaminated soil or other substances, decontamination may be conducted in an open top solids containment vessel.

- A "Scotch Guard" pad and a non-coating cleaning agent should be used to remove any visible dirt, dust, or other potential sources of contamination.

- A water spray bottle or multi- gallon tank sprayer may be used to lightly moisten dry soil being removed from the equipment, if needed for dust control. Only the minimum amount of water spray should be used to keep the moisture content low.

A post-decontamination survey will be performed to ensure that release limits previously specified have been met.

- Drums shall be used to contain waste materials and shall be placed adjacent to the solids containment vessel on wooden pallets.

10.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at Carswell AFB. This plan is compatible with local, state and federal disaster and emergency management plans as appropriate.

10.1 Pre-Emergency Planning

All workers will be informed of provisions of the emergency response plan, communications systems, and evacuation routes. The plan will be reviewed and revised if necessary, by the SSO. This will ensure that the plan is adequate and consistent with prevailing site conditions.

10.2 Personnel Roles and Lines of Authority

The SSO and Site Manager have primary responsibility for evacuating the site in emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area and evacuation of adjacent facilities. They are additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. If an emergency situation occurs, the individual subcontractor organizations are responsible for assisting the Site Manager and SSO within the scope of the subcontractor's work.

10.3 Emergency Recognition/Prevention

A listing of physical health hazards on-site is provided in Section 2.0. Personnel will be trained in hazard identification. The SSO is responsible for ensuring hazard prevention devices or equipment are available to site personnel.

10.4 Evacuation Routes/Procedures

In the event of an emergency which necessitates evacuation of the work areas, the following procedures will be implemented.

1. Proceed to the closest exit

2. Gather at the predetermined primary assembly area (relocate at predetermined secondary assembly area if necessary)

3. Perform head count to verify all present

4. Notify Regional Health and Safety Coordinator

The SSO shall define the site emergency evacuation route during the initial and subsequent site safety training sessions.

10.5 Emergency Contact/Notification System

Table 10.1 provides the names and telephone numbers for emergency contact personnel at Carswell AFB. In the event of a medical emergency, personnel will take direction from the SSO or Site Manager and notify the appropriate emergency organizations. In the event of a fire or spill, the Site Manager will notify the appropriate local, state, and federal agencies.

TABLE 10. 1

CARSWELL AFB EMERGENCY CONTACTS

Organization	Contact	Emergency Telephone	Business Telephone
Ambulance	Medstar	911	
Fire - Primary	Fort Worth Fire Department	911	
- Secondary	Carswell AFB Fire Department	911 (request transfer to Carswell AFB Fire Department) or 782-6330	782-6334 or 6335
Hospital	Cherry Lane Hospital	911	
National Response Center		(800) 424-8802	
Center for Disease Control		(404) 488-4100	
Chemtrec		(800) 424-9300	

10.6 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the exclusion and/or contamination reduction zones must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed.

First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Project Manager, SSO, Regional Health and Safety Coordinator, and the Corporate Health and Safety Officer.

A minimum of one person on site will be currently certified in Standard First Aid/Adult CPR by the American Red Cross.

Any person being transported to a clinic or hospital for treatment should be accompanied with a complete copy of the HSP.

Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

Any person who becomes ill or injured without the concern of contamination shall also seek appropriate medical assistance.

An Accident/Injury investigation shall be performed at the end of the event to determine the means by which future similar events can be avoided. Appendix K provides the Accident Report Form.

10.7 Fire or Explosion

In the event of a fire or explosion, all personnel shall evacuate and contact the Local Fire Department or the Carswell AFB fire protection crew. Upon their arrival, the SSO or Site Manager will advise the Fire Commander of the location and nature of the event and identification of any known hazardous materials in the affected area.

10.8 Spills or Leaks

In the event of a spill or a leak, site personnel will implement emergency containment procedures to limit the spread of material and inform the Site Manager. If necessary, the area shall be evacuated and containment procedure reassessed. The Site Manager will then contact the designated commander in charge of the Carswell AFB fire protection crew.

10.9 Emergency Equipment/Facilities

All emergency alerting and response equipment shall be available at the interface of the support and contamination reduction zones. At a minimum, this shall include the following:

- Air Horn
- First Aid Kit
- Fire Extinguisher (Rated 2A/10BC)
- Eye Wash
- Emergency Shower, or hose connected to potable water supply
- Ice Water
- Stretcher
- Designated Emergency Vehicle.

TAB

APPENDIX A

APPENDIX A

HEALTH AND SAFETY PLAN APPROVAL SHEET

HEALTH AND SAFETY PLAN APPROVAL SHEET

This site health & safety plan has been written for the exclusive use of Metcalf & Eddy, Inc. employees and subcontractors. M&E claims no responsibility for its use by others. The plan is written for the specified site conditions, dates, and personnel and must be amended if these conditions change.

PREPARED BY:

N/A
Site Health and Safety Officer _____ Date

REVIEWED BY:

Regional Health and Safety Coordinator STEVE SILVERBERG 04/19/96 Date

Project Manager 4/17/96 Date

TAB

APPENDIX B

APPENDIX B

SITE SAFETY PLAN AMENDMENT FORM

SITE SAFETY PLAN AMENDMENT FORM

287 50

Amendment # _____

Site Name _____

Work Assignment # _____

Date _____

Type of Amendment _____

Reason for Amendment _____

_____

_____

Alternate Safeguard Procedures _____

_____

_____

Required Changes in PPE _____

_____

_____

_____ _____

Regional Health & Safety Coordinator Date

_____ _____

Project Manager Date

TAB

APPENDIX C

APPENDIX C

CONFINED SPACE ENTRY PROCEDURES

AWT POLICIES & PROCEDURES	SECTION A Health & Safety	NUMBER: 1001
SUBJECT: Confined Space Entry		REVISION: 0
		ISSUED: 10/93
		PAGE 1 of 13

1. Purpose

To provide for the safety of all personnel involved with confined space entries.

To implement the regulations as required by OSHA 29 CFR 1910.146 - Permit Required Confined Space.

2. Scope

This policy applies to all divisions of AWT and its subsidiary corporations.

3. Definitions

3.1 Permit Required Confined Space - An enclosed space which has the following characteristics:

- Is large enough so that an employee can enter and perform assigned work, and
- Has limited or restricted means for entry or exit, and
- Is not designed for continuous employee occupancy
- and may have one or more of the following conditions:
  - contains or potentially contains a hazardous atmosphere
  - contains a material with the potential for engulfment
  - has an internal configuration such that an entrant could be trapped or asphyxiated
  - contains any other recognized serious safety or health hazard

3.2 Confined Space Attendant (CSA) - An individual assigned to monitor activities of personnel working in a confined space. The CSA monitors and provides external assistance to those inside the confined space. The CSA can terminate any confined space entry, summon rescue personnel in the event of an emergency and assists the rescue team or perform a non-entry rescue.

3.3 Confined Space Authorized Entrant (CSAE) - An individual who is authorized by the employer to enter a permit required confined space.

3.4 Confined Space Supervisor (CSS) - An individual who is authorized by the employer to be responsible for determining if acceptable entry conditions are present at the permit space, for authorizing and canceling the entry permit and overseeing the entry operations. CSS may also serve as a CSA or CSAE if so trained in these roles and responsibilities.

APPROVED BY:

3.5 Entry - Entry into a confined space occurs as soon as any part of the entrant's body breaks the plane of an opening into the space.

3.6 Entry Permit - A printed document which defines the conditions under which a confined space may be entered, states the reason for entry, anticipated hazards, personnel involved and length of time for which the permit is valid.

3.7 Hazardous Atmosphere - An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following:

- Flammable gas, vapor, or mist in excess of 10% of its Lower Flammable Limit (LFL);
- Airborn combustible dust at a concentration that meets or exceeds its LFL;
- Atmospheric oxygen concentration below 19.5% or above 23.5%;
- Atmospheric concentrations of any substance for which there is a Permissible Exposure Limit (PEL) or published dose that could result in employee exposure in excess of its PEL or dose.
- Immediately Dangerous to Life and Health (IDLH) conditions

4. Policy

4.1 Entry permits

4.1.1 An entry permit shall be completed whenever an entry into a confined space is to be performed. (Attachment 1).

4.1.2 Entry permits may be obtained by contacting the Site Safety Officer.

4.1.3 The entry permit shall be completed by the entrants prior to any entry into a permit required confined space.

4.1.4 Each completed entry permit shall be approved by the Confined Space Supervisor (CSS) prior to the start of the entry.

4.1.5 Upon completion of the operation the entry permit shall be canceled by the Confine Space Supervisor and forwarded to the Site Safety Officer for filing.

4.2 Posting/Guarding

4.2.1 A "Danger Confined Space - Entry Permit Required" sign shall be posted at the entrance to the confined space.

4.2.2 Whenever the access hole is flush with a floor or ground surface, or is in a pedestrian or vehicular passageway the area shall be roped or barricaded.

4.3 Hazard Evaluation

4.3.1 The atmosphere inside the confined space shall be remotely monitored for hazards prior to each entry and throughout the operation.

4.3.2 Direct reading instruments shall be used for oxygen concentration, combustible gases and potential toxic contaminants.

4.3.3 All monitoring equipment shall be maintained, calibrated, and operated in accordance with manufacturers specifications.

4.3.4 If any equipment malfunctions or appears to malfunction, the entry shall be terminated until the situation can be corrected.

4.4 Hazard Isolation

4.4.1 Actions to isolate confined space hazards shall be performed prior to entry. These include but are not limited to, blanking or blinding, double block and bleed or lockout and tag. See Policy #903 "Energy Control - Lockout and Tagout".

4.4.2 If the confined space is determined to contain a hazardous atmosphere then forced ventilation shall be used to reduce or eliminate the hazard.

4.4.3 If forced ventilation cannot be used or is not effective, then the Site Safety Officer shall be consulted to determine the appropriate level of personal protective equipment required to perform the task.

4.5 Communications

4.5.1 Communications between the confined space attendant (CSA) and confined space authorized entrant (CSAE) shall be continuously maintained through visual means, 2-way radio or other equivalent methods.

4.5.2 The confined space attendant (CSA) shall also have immediate availability of communication devices to contact rescue services.

4.6 Medical Requirements

4.6.1 Any member of a confined space entry team (i.e. CSS, CSAE, CSA) who will require respiratory protection to perform the entry will follow the medical requirements for 29 CFR 1910.134 Respiratory Protection and Policy #'s 606 & 607.

4.7 Training Requirements

4.7.1 All entry team members shall receive initial training in the identification of confined spaces and the requirements of this policy.

4.7.2 All confined space entry team members shall receive refresher training whenever there is a change in the confined space entry operations that present a hazard for which they have not yet been trained for, the employee's duties and or responsibilities have changed, or when evaluation of this policy identifies inadequacies in the employee's knowledge.

4.7.3 In addition, confined space attendants (CSA) shall be Red Cross certified in First Aid and Cardio-Pulmonary Resuscitation (CPR).

4.8 Rescue

4.8.1 Rescue teams trained in confined space responses must be available to assist the confined space attendant (CSA) in emergency situations.

4.8.2 Rescue teams that are a part of a fire department, Haz-Mat team or other outside agency shall be informed of the hazards associated with the confined space prior to the start of any activities.

4.9 Contractors

4.9.1 If non-Air & Water Technologies employees must also enter the confined space, then AWT shall provide them with available information on the permit space hazards and a copy of this policy.

4.9.2 Contractors shall be required to meet all applicable regulations associated with the entry and shall be responsible for providing all necessary personnel and safety equipment for the entry.

ATTACHMENT 1
AWT
CONFINED SPACE ENTRY
WORK PRACTICE GUIDELINE

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, limited visibility, and restricted movement. This section will establish guidelines for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910.146.

Definitions

Attendant: The individual stationed outside of the permit space who monitors the authorized entrants.

Authorized entrant: An individual who enters the permit space.

Entry Supervisor: The individual responsible for determining acceptable entry conditions exist, for authorizing entry, overseeing entry operations, and for terminating entry as needed. The entry supervisor may also serve as the attendant or authorized entrant.

Confined Space: A space or work area not designed or intended for normal human occupancy; having limited means of entry and exit; and is large enough so configured that an employee can bodily enter and perform assigned work.

Entry: The action by which a person passes through an opening into a permit required confined space.

Entry permit (permit): The written or printed document that is provided by the employer to allow and control entry into a permit space. The permit shall meet the requirements of 29 CFR 1910.146(f).

Hazardous atmosphere: An atmosphere with the following conditions:

A. Greater than ten percent (>10%) of the Lower Explosive Level (LEL).

B. Airborne combustible dust greater than LEL (dust obscures vision at a distance of 5 feet or less).

C. Atmospheric oxygen concentration is less than 19.5 percent (<19.5%) or greater than 23.5 percent (>23.5%).

D. Atmospheric concentration of a substance which could result in employee exposure greater than the permissible exposure limit (>PEL) or a published exposure limit.

E. Any atmospheric condition that is immediately dangerous to life and health (IDLH).

Permit-required confined space (permit space): A confined space that has one or more of the following characteristics:

A. Contains or has the potential to contain a hazardous atmosphere.

B. Contains a material that has the potential for engulfing an entrant.

C. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section.

D. Contains any other recognized serious safety or health hazard.

Entering a confined space requires the following to be completed:

1. **Hazard identification** - Identify and evaluate each hazard of the permit space, including determination of severity.

2. **Hazard control** - Establish and implement the means, procedures, and practices by which the permit space can be entered safely.

3. **Permit** - An entry permit will be completed before entry of a confined space.

4. **Employee information** - Signs shall be posted at permit spaces to notify employees that only authorized entrants may enter the permit spaces or that an entry permit is required.

5. **Prevention of unauthorized entry** - Prevent unauthorized employee entry through such measures as training or by posting signs and barriers, as necessary.

6. **Employee training** - Train employees, as provided by this standard, so that supervisors, attendants, authorized entrants and personnel authorizing entry can work safely in and around the permit space.

7. **Equipment** - Provide, maintain, and ensure the proper use of the equipment necessary for safe entry, including testing, monitoring, communication, and personal protective equipment.

8. **Rescue** - Ensure that the procedures and equipment necessary to rescue entrants from permit spaces are implemented and provided.

9. **Protection from external hazards** - Ensure that all pedestrian, vehicle or other barriers necessary to protect entrants from external hazards are provided.

10. **Duty to other employers** - Ensure that, when an employer such as a contractor plans to send employees into a permit space that is under the control of another employer (host employer), the host employer provides the contractor with all available information on permit space hazards, safety rules, and emergency procedures of which the contractor needs to be aware to comply with this standard.

In addition, the following rules must be adhered to:

1. Confined-space work shall be undertaken only under controlled traffic conditions where applicable.

2. Vehicles shall not be left running near confined space work or near air-moving equipment being used for confined space ventilation.

3. Smoking in confined spaces is prohibited.

4. Verify that any hot work (welding, burning, open flames, or spark-producing operation) that is to be performed in the confined space has been approved and that the permit is attached to the confined-space permit. The hot work authorization shall be noted prominently on either the entry or on a separate hot work permit that is attached to the confined-space permit.

Procedures

1. Implement measures necessary to prevent unauthorized entry.

2. Identify and evaluate hazards of permit spaces before employees enter the space. This will be implemented in the project pre-planning stages. The Site Safety Officer can be contacted for assistance.

3. The following should be considered before entry into a permit space. To ensure a safe entry the necessary procedures and equipment to complete the items below should be used throughout the entry.

   a. Acceptable entry condition shall be determined based on the characteristics of the space.

   b. The permit space shall be isolated and completely protected against the release of energy or material. This can be accomplished by: blanking; double block and bleed system; lockout of all energy sources; blocking or disconnecting mechanical linkages; misaligning or removing sections of lines; pipes, or ducts.

   c. Barriers should be provided to protect entrants from external hazards.

4. The following equipment should be provided for each permit space entry. The equipment shall be adequately maintained, calibrated in accordance with manufacturers specifications and employees who use the equipment shall be adequately trained. 287 60

   a. Air monitoring equipment to properly measure O_2, LEL, and toxic atmospheres.

   b. Ventilating equipment such as blowers.

   c. Communications equipment.

   d. Personal protective equipment such as head protection, eye protection, hearing protection, hand protection, foot protection, respiratory protection or full body protection.

   e. Ladders, lighting, barriers, shields.

   f. Rescue and emergency equipment unless it is provided by outside rescue services.

5. The atmosphere within the permit space shall be monitored remotely before entry into the permit space.

6. At least one attendant is in communication with the entrant through the entire entry process.

7. Employees who enter or attend the permit spaces shall be designated and meet the AWT Confined Space policy requirements.

8. Rescue and emergency services shall be determined before entry.

9. Non-entry rescue may be performed by the CSA. This consists of a tripod or other proper anchorage to which a retrieval system is secured to allow the attendant to extricate the entrant from the space in an emergency. The attendant does not enter the space to perform this type of rescue.

10. Entry permits (Attachment 1) should be prepared and used during each permit space entry. The permits should be written and kept on file for a minimum of one year.

11. Site specific procedures must be in place to conclude any entry. At a minimum this will include closing the permit space, removing equipment and cancelling the permit.

12. Procedures for each employer shall be implemented when more than one employer has employees in a permit space simultaneously.

POLICIES & PROCEDURES	A	NUMBER: 1001
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General Provisions

- Confined spaces shall be identified with a posted sign which reads: Danger - Confined Space, Entry By Permit Only.
- Only personnel trained and knowledgeable of the requirements of these Confined Space Entry Procedures will be authorized to enter a confined space or be a confined space observer.
- An Entry Permit (EP) must be issued prior to the performance of any work within a confined space. The EP will become part of the permanent and official record of the site.
- If natural ventilation is not adequate within the confined space prior to initial entry and for the duration of the EP. Positive/forced mechanical ventilation may be required. However, care should be taken not to spread contamination.
- If flammable liquids may be contained within the confined space, explosion proof equipment shall be used. All equipment shall be grounded and bonded.
- All sources of ignition must be removed prior to entry if flammable or combustible conditions exist.
- Hand tools used in confined spaces shall be in good condition, explosion proof and spark proof, when flammable condition exist and selected according to intended use. Where possible, pneumatic power tools are to be used.
- Smoking shall be prohibited in and near all confined spaces.
- Hand-held lights and other illumination utilized in confined spaces shall be equipped with guards to prevent contact with the bulb and when flammable/combustible potential hazards exist they must be explosion proof.
- Compressed gas cylinders, except cylinders used for self-contained breathing apparatus, shall not be taken into confined spaces. Gas hoses shall be removed from the space and the supply turned off at the cylinder valve when personnel exit from the confined space.
- If a confined space requires respiratory protective equipment or where rescue may be difficult, body harnesses, and lifelines will be used. The CSA shall be provided with the same equipment as those working within the confined space.

- A ladder is required in all confined spaces deeper than the employee's shoulders. The ladder shall be secured and not removed until all employees have existed the space.
- Only NIOSH/MSHA approved self-contained breathing apparatus or airline respirators equipped with a 5-minute emergency air supply (egress bottle) shall be used in confined spaces containing hazardous atmospheres or with conditions determined to be immediately dangerous to life and health.
- Where air-moving equipment is used to provide ventilation, chemicals and motor exhausts shall not be located in the vicinity to prevent introduction of harmful or hazardous vapors into the confined space.
- Vehicles shall not be left running near confined space work or near air-moving equipment being used for confined space ventilation.

Entry Supervisor Duties

1. Know the hazards faced during entry.
2. Verifies that all air monitoring is completed and all equipment is available before entry.
3. Terminates the entry when potential hazards are identified or of the end of the entry.
4. Verifies that rescue services and a means of contacting them are available.

Authorized Entrant Duties

1. Know the hazards faced during entry (i.e. sign and symptoms of exposure, routes of entry).
2. Properly trained in use of all equipment associated with the entry.
3. Communicates with the attendant.
4. Alerts the attendant when the entrant recognizes a warning sign or symptom, dangerous situation, or prohibited condition.
5. Exits the permitted space when the attendant, or entry supervisor orders an evacuation, an evacuation alarm is sounded, or a condition in #4 above exists.

Attendant Duties

1. Know the hazards faced during entry (i.e. signs and symptoms of exposure, routes of entry).

2. Is aware of behavioral effects of hazard exposure in entrants.

3. Maintains an accurate count of authorized entrants in the permit space.

4. Remains outside the permit space during entry operations until relieved by another attendant.

5. Communicates with authorized entrants.

6. Monitors activities inside and outside of the permit space. Orders the evacuation of entrants when attendant detects a prohibited condition, behavioral effects by the entrant(s), a situation outside the space that could endanger the entrant, or the attendant cannot effectively and safely perform the duties.

7. Advise unauthorized persons to leave the area.

8. Perform non-entry rescue procedures.

9. Summon rescue and emergency services when assistance is needed to exit the space.

10. Performs no duties that may interfere with these duties.

ATTACHMENT #1
CONFINED SPACE ENTRY PERMIT

I. General Information

Operating Group: _____

Date/Time Issued: _____

Duration of Permit: _____

Date/Time Cancelled: _____

Location and Description: _____

Purpose of Entry: _____

Supervisor: _____

II. Confined Space Entrant(s)/Attendants/Helper

Entrant(s) 1. _____

2. _____

3. _____

Attendant(s) 1. _____

2. _____

3. _____

III. Communication Procedures

To be used by attendants and entrants:

_____

IV. Permit-Space Hazards (Check all that apply)

- ❑ Atmospheric hazards
  - ❑ Oxygen deficiency (<19.5%)
  - ❑ Oxgen enrichment (>23.5%)
  - ❑ Flammable gases or vapors (>10% of LFL)
  - ❑ Airborne combustible dust (< or = LFL)
  - ❑ Toxic gases or vapors (>PEL)
- ❑ Engulfment
- ❑ Mechanical hazards
- ❑ Other
  - ❑ Electric shock
  - ❑ Materials harmful to skin
  - ❑ Specify _____

V. Emergency Service

Name of Service _____

Phone Number _____

Method of Contact _____

_____

VI. Required Personal Protective Equipment

	N/A	Yes	No		N/A	Yes	No
Direct Reading Atmospheric Monitor(s)	( )	( )	( )	Hard Hat	( )	( )	( )
Safety Harnesses and Lifeline for Entrant and Attendant	( )	( )	( )	Steel-Toe Shoes/Boots	( )	( )	( )
Escape Retrieval Equipment	( )	( )	( )	Hearing Protection	( )	( )	( )
Two-Way Radios	( )	( )	( )	Safety Glasses	( )	( )	( )
SCBA/SAR for Entrant and Attendant	( )	( )	( )	Gloves	( )	( )	( )
All Electric Equipment and Illumination Devices Listed Class I, Division I, Group A,B,C & D and Nonsparking Tools	( )	( )	( )	Protective Clothing	( )	( )	( )

VII. Site Control and Monitoring

A. Pre-Entry

1. Atmospheric Checks:
   Time _____ Explosive _____% LFL
   Oxygen _____% Toxic _____ ppm
2. Source Isolation (No Entry):

	N/A	Yes	No
Pumps or Lines Blinded	( )	( )	( )
Disconnected or Blocked	( )	( )	( )
Electrical Lock/Tag	( )	( )	( )

3. Ventilation Modification:

	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation Only	( )	( )	( )

4. Atmospheric Check After Isolation and Ventilation:
   Time _____ Explosive _____ % LFL
   Oxygen _____ % Toxic _____ ppm

5. Sampling Equipment

Equipment		
Calibration Date		
Model &/or Type		
Serial &/or Unit #		

B. Requirements Completed Prior to Entry

	N/A	Date	Time
Lockout/De-Energize/Tagout	( )	____	____
Line(s) Broken-Capped-Blanked	( )	____	____
Purge-Flush and Vent	( )	____	____
Mechanical Ventilation	( )	____	____
Secure Area (Post and Mark)	( )	____	____
Pedestrian & Vehicle Guards/Barriers	( )	____	____
Lighting (Explosive Proof)	( )	____	____
Fire Extinguisher (Type)	( )	____	____

C. **Atmospheric Monitoring Record**

	Hazards							
			Toxics					
	Oxygen	LEL						
Time	Operating Limits							
Hr:min	19.5% to 23.5%	<10%	ppm	ppm	ppm	ppm		
PEL or Dose								
Action Level								

V. **Confined Space Attendant**

Confined Space Attendant is Required for All Confined space Work
Name of Attendant(s):

_____ _____

_____ _____

VI **Supervisor Authorizing Entry**

All Above Conditions Satisfied Yes ( ) No ( )

Department _____ Phone _____

Printed Name _____ Signature _____

TAB

APPENDIX D

APPENDIX D

MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEETS

Chemicals of Concern

Gasoline
Diesel Fuel
Lead

Chemicals M&E Personnel May Bring Onsite

Isopropyl alcohol
Nitric acid
Sulfuric acid
Hydrogen gas
Sodium hydroxide
Dry ice (solid CO_2)

TAB

APPENDIX E

APPENDIX E

CARSWELL AFB REGULATION 92-1 - BASE FIRE REGULATION

DEPARTMENT OF THE AIR FORCE
Carswell AFB TX 76127-5000

CARSWELL AFB REGULATION 92-1 287 71
27 December 1989

7th Civil Engineering Squadron

BASE FIRE REGULATION

This regulation implements AFR 92-1 and affixes definite fire prevention principles and objectives and fire protection procedures and responsibilities at Carswell Air Force Base. At least one copy of this regulation will be posted in organizational files and all personnel made aware of its contents; this includes vendors and contractors.

Supersedes CAFBR 92-1, 11 Mar 83 (See page 23 for summary of changes)
No. of Printed Pages: 33
OPR: 7 CSG/DEF (GS-12 Donald D. Smith)
Approved by: LTC Charles Jackson
Editor: SSgt Satroplus
Distribution: F;X

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1. RESPONSIBILITIES:

a. Base Fire Marshal.

The Base Civil Engineer is the Base Fire Marshal and is responsible to the 7th CSG Commander for the accomplishment of overall fire prevention, fire protection, firefighting and crash rescue.

b. Base Fire Chief.

The Fire Chief, or in his/her absence, the Assistant Chief, acting under the Fire Marshal, will be in complete charge of all firefighting or crash rescue activities. All unauthorized personnel will be restricted from the fire area, and no person will interfere with the Fire Chief, firefighting personnel, or equipment. The Fire Chief will ascertain whether assistance is needed from neighboring fire departments. The Fire Chief has authority to commandeer vehicles, materials and personnel as required to combat fire and/or effect rescue. The Fire Chief is responsible to the Fire Marshal for the administrative and technical operation of the Base Fire Department. Investigations to determine the cause of fires will be conducted at the scene by the Senior Fire Protection Supervisors. In cases where arson is suspected, the OSI will be notified through the Fire Marshal.

c. Chief, Security Police.

The Chief, Security Police will provide personnel for traffic control at the scene of fires. Unauthorized vehicles and spectators will not be admitted to the fire scene. Control of children in the Military Family Housing Area is of prime importance. It is essential off-duty fire protection personnel be permitted access to the emergency scene. Upon request, guards will be posted at the scene to prevent unauthorized access and tampering until investigations are completed. Law enforcement personnel will respond and establish traffic control upon notification of simulated building fires.

d. Hospital Commander.

The Hospital Commander will establish procedures to insure immediate response of medical personnel and ambulances to the scene of fires when deemed necessary by the Base Fire Chief or his/her representative. Medical personnel will monitor the fire-crash radio net at the Medical Control Center during all fires for the purpose of medical response, should it be necessary.

e. CE Service Call.

CE Service or Call Zone Controllers will be notified by the Fire Alarm Communications Center of all emergencies and immediately dispatch appropriate utilities personnel to the scene. For structural fires and drills, only electrical technicians will be required immediately. Other technicians will be dispatched as requested.

f. Unit Commanders.

Unit Commanders are responsible for and must insure that sound fire prevention procedures are established and practiced. They will:

1. Advise Technical Services of fire hazards which cannot be corrected by unit personnel.

2. Immediately inform Technical Services of any fire extinguishers which were discharged or damaged and any installed fire protection system which may have been damaged during operation by accident or by contact with material handling equipment.

3. Develop an operating instruction for his/her unit to follow when fire is discovered. Instructions must cover fire reporting, personnel evacuation, safeguarding classified information, and first aid firefighting (manning hose station and fire extinguishers). Depending on the type of activity, instructions also include such items as emergency removal of aircraft from hangars, protection of high-value and critical material, and accidents involving fuel handling. Forward copy to Base Fire Department.

4 Request Technical Services to provide appropriate lectures and demonstrations. Schedule training to obtain largest possible audience.

5. Insure a fire prevention orientation has been received by all assigned personnel, as outlined in AFR 127-12. Military and civilians must receive this training within 30 days after reporting for duty.

6. Perform fire prevention inspections of facilities; rooms or areas which are under continous lock and key are the responsibility of the individual supervisor maintaining that secured area. Additionally, it is their responsibility to arrange access to these facilities for the Base Fire Department to perform scheduled fire prevention inspections.

7. Insure personnel under their jurisdiction comply with this regulation and all other applicable instructions to accomplish all tasks in a fire-safe manner.

8. Conduct periodic indoctrinations directed specifically toward hazardous conditions/operations associated with the working environment.

9. Coordinate with the Fire Protection Branch potential fire hazardous conditions which may appear in new procedures or operations, changes in the facility, etc.

10. Not allow any self-help work to be acomplished on any facility under his/her jurisdiction without an approved AF Form 332, "BCE Work Request", that has been coordinated through the Fire Department and approved by Civil Engineers.

g. Real Property Managers.

Real Property Managers are responsible to the Unit Commander (functional manager) for the fire-safe condition of the facilites under his/her jurisdiction as specified in AFR 92-1 and AFR 127-12. The real property manager or his/her alternate will:

1. Accompany the fire inspector during scheduled fire prevention inspections and effects immediate corrective action of fire hazards noted during the inspection. Frequency of inspections will be as outlined in AFR 92-1. On completing the inspection the fire inspector will brief the real property manager, or his/her alternate on the results of the inspection. If an AF Form 1487 (FIRE PREVENTION VISIT REPORT) is issued, part 2 of the AF Form 1487 will be given to the facility manager or his/her alternate at the time of the inspection. Part 1 is sent to the functional manager who is responsible for seeing that the AF Form 1487 is properly annotated and signed, and returned to the Fire Department by the suspense date indicated on the front of the form.

2. Receive training on the job, conducted by the Base Fire Department to assure an efficient fire prevention program (Guide for Facility Managers, Atch 2). Step-by-step operation of fixed extinguishment systems will be covered where pertinent and as required.

   a. To insure serviceability, the real property manager is responsible for performing monthly inspections on all fire extinguishers within their facilities.

   b. Inspections are designed to insure extinguishers are located in their designated places, that they have not been discharged or tampered with, and to detect any obvious physical damage, corrosion or other impairments.

   c. Records of monthly inspections performed will be maintained at the work area in the real property manager's six-part folder.

3. Report changes in his/her building which might affect fire extinguisher allocation.

4. Deliver defective extinguishers to the Base Fire Department for maintenance.

5. Instruct newly assigned personnel in the location and operation of all extinguishing systems, fixed or portable, and promptly report all system deficiencies to the Base Fire Department.

6. Conduct frequent briefings to insure all personnel understand and observe all fire regulations and to insure they are aware of the proper fire reporting and building evacuation procedures.

7. Arrange for fire evacuation training to be conducted quarterly in places of public assembly, hospitals, child care centers, and industrial occupancies; and monthly for family day care homes and billeting by the real property managers and monitored by the Technical Services Section, to insure that assigned personnel are thoroughly trained in proper procedures for fire evacuation and suppression in case of fire.

8. Insure that a fire inspection at the end of each day or shift is accomplished. See Attachment 3.

9. Maintain a six-part folder. Folder to contain:

Part 1. Base Fire Regulation
Part 2. OI Fire Prevention and Reaction Plan
Part 3. Extinguisher Log
Part 4. AF Form 1487's (if any)
Part 5. Training Log/Certifications
Part 6. Misc-AF Form 332, Variances, requests, waivers.

h. Supervisors.

Supervisors at all levels are responsible to the Unit Commanders for fire safe conditions and insuring personnel under their jurisdiction comply with sound fire prevention procedures as outlined in this regulation.

*2. FIRE REPORTING AND EVACUATIONS:

a. Any person who discovers a fire will immediately report it to the Base Fire Department by the quickest means available.

1. Phones: Dial "9-1-1" to report a fire. Stay on the line until told to hang up by the Fire Department Operator.

b. Building Evacuation Alarm System: All manual pull stations should notify the Base Fire Department. To insure the Fire Department is notified, personnel discovering a fire should activate the fire alarm system and call the Fire Department (dial 9-1-1) on any base telephone. Personnel hearing an alarm system ringing should call the Fire Department.

c. The following actions will be taken immediately after discovering a fire, regardless of how minor in nature.

1. Notify all occupants to evacuate building immediately.
2. Call the Fire Department. Dial "9-1-1".
3. Attempt to extinguish the fire.
4. If extinguishing efforts fail:
   a. Close all doors and windows, DO NOT LOCK
   b. Evacuate the building to a predesignated area and remain outside the building to direct firefighters to the scene of the fire.

d. The willful transmission or reporting a false fire or emergency alarm is prohibited.

*3. SMOKING:

a. AFR 30-27, Smoking in Air Force Facilities, places responsibility on commanders and supervisors for determining smoking areas. All buildings are considered as no smoking unless marked otherwise. No person shall smoke in bed or while reclining on beds.

b. Smoking is prohibited in all government vehicles. Smoking and the lighting of smoking materials is prohibited within 50 feet of:

1. Aircraft maintenance hangar/nosedocks
2. Paint and dope shops
3. Petroleum, oil, lubricating (POL) storage or dispensing areas
4. Flammable liquids
5. Fuel dispensing vehicles (fueling, defueling)
6. Ammunition storage areas
7. Any other areas obviously hazardous but not listed, ie, loading docks with doors open.

c. Flame or spark producing devices will be strictly controlled in accordance with pertinent directives inside hazardous areas; i.e., bulk fuel storage area. Ammunition storage and maintenance areas will take positive measures to collect these items at specific points.

d. Tobacco ash receivers will be provided at the entrance to each building where smoking is prohibited. Smoking material will be emptied into metal receptacles that are identified for the disposal of same. Supervisors will assure the contents of these receptacles are wet with water or cold/safe before they are emptied into trash collection containers.

e. The use of strike matches (kitchen) anywhere is prohibited. Only safety type matches are approved for use on Carswell AFB to include military family housing area.

4. HOUSEKEEPING:

a. Buildings and areas will be kept as clean and free of debris as possible at all times. Good housekeeping practices will be enforced at all times.

b. Waste paper containers will be emptied as often as necessary, at least at the end of each day and/or shift. Outside dumpsters will be kept closed and will be located at least ten (10) feet from the building.

c. All rags will be kept in closed metal containers with lids marked either "Clean Rags" or "Dirty Rags" in industrial shops.

d. Only metal containers will be used for waste collection, storage or transportation, except in dining halls and hospitals where other type containers may be used with the approval of the Base Fire Chief.

e. Burning of rubbish or the use of open fires is prohibited on Carswell Air Force Base.

f. Lint bags and filters on clothes dryers will be emptied as required to avoid backup of lint. Exhaust tubes will be disconnected and cleaned as often as necessary. Dryers are to be vented to the exterior of the facility. Vent pipes many not have more than two (2) ninety-degree bends in them to prevent clogging.

g. Holes and cracks in all facilities will be properly repaired and will not be used for the disposal of combustible material.

h. Live Christmas trees will not be used in dormitory day rooms or individual rooms.

i. No open flame lighting devices will be used in any building except where necessary for ceremonial or religious purposes and then only on approval of the Base Fire Chief. Candles may be used on table utilized for food service if securely supported in non-combustible containers and so located to preclude ignition of nearby combustibles and the candle flame is protected.

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*5. WAREHOUSING AND STORAGE:

a. Only small amounts of packing materials will be brought into buildings other than designated packing and crating areas where proper storage facilities are available. Packing materials will be stored in containers with self closing lids. All flammable spills and combustible debris will be removed on a continual basis.

b. All associated excelsior, paper and fiber, will be stored in metal containers with self closing cover.

c. Aisles must be clearly marked and maintained to afford proper firefighting capabilities.

d. Storage and warehousing will be in accordance with DOD 4145.19 R-1, Storage and Warehousing.

e. Eighteen inch clear space will be maintained beneath all sprinkler heads. If storage exceeds 15 feet in height, a 36-inch clearance will be maintained beneath sprinkler heads.

f. Fire Doors will be maintained clear of storage to insure proper operations.

g. Sight or access to any firefighting appliance, sprinkler, riser, or control will not be blocked nor will these devices be used for purposes other than for what they were designed. Maintain a minimum 36-inch clearance away from all firefighting appliances.

h. Authorized vehicles operating within warehouses will be maintained in a safe working condition, and a complete daily inspection will be made to prevent fire originating from such vehicles.

i. Bins will be constructed as outlined in DOD 4145.19 R-1, Storage and Warehousing.

j. Powered material handling equipment parked inside general purpose warehouses will be in compliance with DOD 4145.19.R-1, Storage and Warehousing.

k. Attic space will not be used for any type storage or habitation and will be off limits to smoking.

l. Do not store pallets where they obstruct fire lanes and personnel exits. Store idle pallets in warehouses or other storage inside or outside as follows:

(1) Outside

(a) Store a day's working supply of idle pallets along the outer edge of facility loading dock.
(b) Do not store exceeding a height of six pallets per stack.
(c) Store other pallets away from the building as follows:

[1] Less than 50 pallets - 20 ft.
[2] Less than 200 pallets - 30 ft.
[3] Over 200 pallets - 50 ft.

(2) Inside

(a) Do not store higher than 6 ft.
(b) Allow eight feet of clear space to separate pallet stacks. In addition, allow 8 ft of clear space to separate pallet stacks from other commodities.

*6. WELDING:

Welding, cutting and soldering (brazing) will be performed in shops designated for this type work. An AF Form 592, "USAF Welding, Cutting and Brazing Permit" will be issued by a representative of the Fire Department on all work performed outside designated shops. All work will be inspected prior to issuing an AF Form 592. Also, the inspector will determine if a fire guard or vehicle is required to standby. Qualified personnel will perform the welding, cutting or soldering operations. Civilian Contractors will adhere to these requirements. Welding, cutting and or soldering will be performed IAW AFOSH 127-5, "Welding, Cutting and Brazing". AF Form 592 is to be returned to the fire department upon completion of the operation.

*7. FLAMMABLE AND COMBUSTIBLE LIQUIDS AND GASES:

a. Flammable and combustible liquid and gases will be stored IAW AFOSH 127-43, "Flammable and Combustible Liquids", and the National Fire Codes. These items will be stored in designated buildings except when otherwise specified. A one-day supply is authorized in buildings for daily use. The unused quantity and drop cloths will be removed from the building at the end of the work day. Sewers or storm drains will not be used for disposal of such contents. Metal safety containers with appropriate markings are authorized for storage, transporting, and dispensing flammable or combustible liquids. Cleaning vats will meet prescribed criteria and only approved solvents will be used in vats.

b. Only non-sparking devices will be used where explosive residue of flammable vapors could be present.

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8. GROUND SERVICING OF AIRCRAFT:

a. Aircraft will be grounded when in parked status.

b. All ground servicing operations will be conducted IAW T.O. 00-25-172 and applicable aircraft handbook.

c. The senior fire protection representative at the scene has authority to stop any servicing operation not being performed according to the references in paragraph b. above.

*9. ELECTRICAL INSTALLATION AND EQUIPMENT:

a. All electrical equipment will be of the appropriate type specified by the National Electric Codes.

b. Electrical equipment, frames and all associated parts will be effectively grounded.

c. Replacement of appliance electric cords will be of the same types, size (gauge) and length of the electric cord originally furnished by the manufacturer and maintained in a safe condition and will not be frayed or spliced.

d. Use of adapters that permit plugging into a light receptacle is prohibited IAW the National Electric Codes.

e. Extension cords will only be used as a temporary measure to connect a lamp or small appliance to the permanent building electrical system.

1. Extension cords and flexible cords will NOT be:

a. Spliced, taped or stapled in any fashion, but will be used in continuous lengths.
b. Used as a substitute for the permanent wiring of a structure.
c. Run from one room to another, run through holes in walls, ceiling, floors, doors, windows, or similar openings. They will not be concealed behind walls, ceilings, floors, or run under rugs, runners or coverings.

2. Extension cords and flexible cords WILL:

a. Be constructed in such a manner that tension will not be transmitted to joints or terminal screws.
b. Be equal in size or exceed the size of the appliance cord to which attached.
c. Bear the Underwriters Laboratories (UL) Label or other nationally recognized testing authority and will not be smaller than 18 American Wire Gauge (AWG).

f. No one will alter basic structural electric wiring system without Civil Engineering approval on an AF Form 332. All electrical wiring will comply with the National Electric Codes. The use of multiple outlet adapters without surge protection is prohibited.

g. A clearance of at least 18 inches will be maintained around light fixtures. Fluorescent lights will not be mounted directly on combustible surfaces, but will have at least half inch clearance.

h. Fluorescent bulbs will be replaced as soon as burned out or flickering to protect the ballasts (one bulb may be removed from the light for energy conservation). Short bulb life span may indicate electrical problems and Civil Engineering Zone should be notified.

i. All portable appliances will be disconnected after use. The only exception is a large appliance such as a clothes dryer or vending machine where bulk would make this requirement unrealistic. The use of timers on portable appliances is prohibited in offices and shop areas, unless the timer is built-in to the appliance.

j. Electrical panels and panel rooms are off limits, except to authorized Civil Engineering personnel.

k. Portable heaters are prohibited in correctional detention and health care facilities. They are not to be used without prior authorization, in writing, from 7 CES/DEM and authorization will be renewed annually. If permission is granted, heater must be equipped with an automatic shutoff and tip-over switch. Placement of portable heater will be approved by the fire department. Do not store combustibles within 36 inches of any space heater.

l. Fuses or circuit breakers will not be bridged, taped, tied closed, or tampered with in any fashion.

m. Appliances will be marked with the name of the manufacturer, the normal rating and Underwriters Laboratories or equivalent seal.

n. All equipment will be operated either with a switch or male plug and will not be wired directly into a circuit without benefit of a quick disconnecting device.

o. Equipment for explosive, flammable, damp or corrosive locations will meet the standards set forth in the National Electric Codes.

p. Motors and motor mount areas will be kept free of dust, dirt and debris to prevent overheating.

q. Unsafe wiring or malfunctioning equipment will be immediately discontinued and reported to the Civil Engineer Zone.

r. Any portable appliance having a heating coil (coffee pots, heaters, etc) will be placed on a noncombustible surface.

s. All battery charger areas will be wired in accordance with the National Electric Code.

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*10. COOKING AND FOOD PREPARATION:

a. Cooking and the use of any heat producing food preparation appliance in other than an authorized, designated area is prohibited.

b. All commercial food preparation areas will be equipped with vapor exhaust, grease removal system, and a fixed fire extinguishing system in accordance with the standards established in AFR 88-15 and the National Fire Code Standard #96.

1. Grease filters will be cleaned as often as necessary to keep them in a grease-free condition. If grease is visible on the filter, it should be cleaned. In any event, filters will be cleaned at least once each day or work shift. Spare filters are required in kitchens operated continuously to prevent the necessity of using a less effective wet filter.

2. Exhaust systems will be in operation at all times while cooking is being accomplished, and should run for a period of at least one hour after cooking devices are turned off to allow deep fat fryers and other appliances to cool down.

3. Systems will not be operated without filters in place.

4. Detailed information and specifications of all systems will be furnished to the Base Fire Chief prior to installation and/or modifications.

5. Using personnel will be responsible for the cleanliness of all fans, filters, hood and duct work that is within reach.

c. Real Property building managers will maintain the following information on file for each range hood:

1. Date hood and filters last cleaned.
2. Date ducts last cleaned.
3. Date ducts cleaned by Civil Engineering or Contractor

d. Charcoal broilers or grills will be used only in safe areas.

1. Where used in authorized indoor location, ignition will be accomplished only with an electric or installed gas igniter.
2. Outdoor clearance from buildings will be commensurate with the type of facility and the size of the fire with a minimum clearance of 10 feet.

e. All deep fat fryers will be maintained IAW AFOSH 127-56. Covers will be available for all deep fat fryers. All thermostats will be tested by Civil Engineering or contractor on a semi-annual basis.

11. AISLES, CORRIDORS AND EXITS:

a. Aisles will be clear at all times to afford access to fire fighting and building evacuation. Aisles will not be obstructed in any way, and will maintain the same width as the exit door(s).

b. Exits will be marked IAW AFR 88-15 and the NFPA Life Safety Code.

c. Exit doors in places of public assembly, retail mercantile facilities and buildings with a high personnel occupancy will be equipped with "Panic Hardware" IAW AFR 88-15 and NFPA Life Safety Code.

d. Fire doors and/or fire exit doors will not be blocked, wedged or hooked in any manner which hinders the "as designed" operation.

e. All building doors that are blocked will be clearly marked on the outside, "Door Blocked" in four-inch letters. Doors will not be blocked without prior written approval of the Base Fire Chief.

*12. PLACE OF PUBLIC ASSEMBLY

a. Theater projection booths will be equipped with automatic shutters over all ports leading to the seating area.

b. Glass covered ports in projection booth will be replaced immediately when broken.

c. Places of public assembly will not be used as sleeping areas nor will they be used as storage areas.

d. Scenery, decorations, drapes, upholstery, curtains and all decorative material will be flame-proof. Do not use cardboard boxes, wood products, straw, hay or similar material for festive decorations. All materials used will be inspected and tested at frequent intervals to insure retention of flame-proof characteristic unless the material is certified as being permanently flame-proof by a nationally recognized testing organization. Prior to decorating for festive events the Fire Department Technical Services Section will be notified for inspection and approval.

*13. CLOSING INSPECTION:

a. The following facilities are required to conduct and document a daily closing inspection. Use Attachment 3 and retain on file for one (1) year.

1. Officers Club, NCO Club, Golf Clubhouse, Library, Theater, Recreation Center, Child Care Center, Bowling Alley, Youth Center and individual Hobby Shops if not located and controlled by another "call-in" facility.
2. All other places of assembly not covered above and any facility or area designated by the Base Fire Chief.

b. Closing inspections will consist of, but not limited to, insuring all waste material is removed from the building. Insure the contents of ashtrays are not mixed with waste paper. Inspect furniture to insure waste smoking material is not present. Cushions of upholstered furniture will be inspected to insure there is no smoldering smoking material. Inspect all electrical operated machines to insure they are disconnected, if not required for use, and inspect all cooking areas, restrooms and closets for fire-free condition.

*14. FIREWORKS:

No type of fireworks will be handled, stored or used on the base except for public display by competent operators licensed in compliance with state and federal regulations and with the written permission of the Base Fire Chief.

15. VEGETATION CONTROL:

a. Vegetation will not be permitted to grow excessively or to accumulate near buildings, tanks, aircraft parking areas, storage areas or other similar property.

b. Shrubs and trees around buildings will be trimmed as often as needed to provide proper vegetation control. Dead trees will be removed immediately. The use of heat-producing devices for the control of vegetation is prohibited except by special permission of the Base Fire Chief.

c. Only nonsparking devices will be used in areas where explosive residue of flammable vapors could be present.

16. MECHANICAL ROOMS:

a. These areas will be kept neat and clean at all times and will not be used for storage of any materials.

b. Mechanical rooms are off limits to all personnel except Civil Engineering Craftsmen. Storage or entry into these rooms is prohibited.

17. HANGARS AND AIRCRAFT:

a. Clear areas will be maintained around aircraft to allow access of fire equipment and for the evacuation of personnel and other aircraft.

b. All aircraft will be connected to low resistance ground at all times when in parked and/or hangared status.

c. All ground and bonding connections will be made prior to opening fuel, LOX or GOX caps or covers.

d. Fuel from aircraft will not be allowed to drain on the ramp or hangar floors. Fuel bowsers will be used for continuous fuel leaks.

e. All electrical equipment, installed and portable, will be in accordance with the requirements of the National Electric Codes.

f. Only specially authorized vehicles will be permitted in hangars. These vehicles will be equipped with flashback spark arresters and vaporproof systems. These vehicles will enter hangars only for specific duties and will be immediately returned to the outside at the completion of the task.

g. There will be no fuel operations inside a hangar or maintenance docks, except in designated approved fuel cell repair docks.

h. Herman-Nelson or similar type heaters will not be used without prior approval of the Base Fire Chief.

18. STATIC ELECTRICITY:

a. All personnel involved with aircraft or flammable liquids will be aware of and comply with the provisions of T.O. 00-25-172. The contents of the Technical Order covers ground servicing of aircraft and static grounding and bonding for transfer of flammable liquids.

b. All personnel working in hazardous or explosive areas will wear non-spark producing clothing as outer garments. Nylon, wool and other materials are extremely dangerous in that they create static electricity.

19. POWERED MATERIAL HANDLING EQUIPMENT:

a. This concerns cranes, forklifts, tugs, tractors, lawn mowers, AGE Ground Servicing Units, etc.

b. Equipment will be in good operating condition and will be inspected by the user on a daily basis to insure safe condition.

c. Parking, inside where permitted, will be to the extreme side of aisles with ignition shut off and the hand brake set.

d. Equipment used in flammable or explosive atmospheres, warehouses, and other dangerous areas will be equipped with flashback spark arresters and appropriate safe (waterproof or shielded) igniton systems. When it is necessary to park inside warehouses, the vehicle will be parked only in approved areas authorized by the Base Fire Chief.

20. EXPLOSIVES:

a. All entrances to the Munitions Storage area will be marked with appropriate "NO SMOKING" signs and all flame or spark producing devices will be surrendered to the guard or be placed in a suitable container provided for that purpose before entering the area.

b. Boxes, containers, dunnage and lumber will be stacked in an orderly fashion and all paints and paint supplies will be stored in suitable metal cabinets, in limited quantities.

c. Ground magazines and/or storage areas will be maintained IAW AFR 127-100, "Explosive Safety Standards".

d. Storage areas will be marked with the appropriate fire symbol IAW AFR 127-100.

e. Munitions will be stored only in buildings that have been designated and maintained for the specific purpose. An explosive facility license is required and may be obtained from the Explosive Safety Officer.

f. Ammunition will be arranged by lot numbers and in stacks in such a manner that air may circulate freely around, beneath and through the stacks.

g. Loose components will not be stored in magazines.

h. Empty containers, excess dunnage or tools will not be permitted to remain in magazines.

21. HAZARDOUS CHEMICALS:

a. Only approved DOT containers will be used for the storage or transportation of chemicals.

b. Containers will be tightly and securely closed unless venting is required.

c. Containers will be labeled to indicate contents.

d. All chemicals will be stored or transported only with compatibles to insure fire safety in isolated areas, IAW AFR 125-37, "The Installation and Resources Protection Program".

e. Scheduled and periodic inspections will be made of storage areas to detect deterioration and/or leaks.

22. VEHICLE PARKING, TRAFFIC CONTROL, STORAGE OF GAS POWERED EQUIPMENT:

a. Parking of vehicles will be carefully regulated in all areas to insure access to all sides of buildings and fire hydrants. Where authorized, vehicles may be parked closer than fifteen (15) feet to a building.

b. Fuel trucks will not enter or be parked within fifty (50) feet of hangars, paint shops, munitions storage, or thru critical areas except for the time necessary to load or unload cargo. Fuel vehicles will not be parked near highly populated areas. When in maintenance shops, parking will be in such a manner to assure rapid and safe removal in case of fire.

c. Motorcycles, mini-bikes, major components or vehicles will not be stored or operated inside any building not specifically designed for that purpose. Any other facility or areas used will be required to have written approval from the Fire Chief.

d. Gasoline powered equipment may be stored inside areas that do not have a ready source of ignition, i.e., hot water heaters, equipment with electric motors, etc. Areas must be approved by the Fire Chief prior to storage of equipment. During the season they are not used, the fuel tank must be drained before storage. At no time will refueling or fuel drainage be performed while equipment is running or the engine is still hot.

e. Vehicles will not be parked:

1. Within fifteen (15) feet of any building where immediate building evacuation or access for firefighting is obstructed.
2. Within fifteen (15) feet of fire hydrants or in such a way as to obstruct immediate access to them.

f. Vehicle operators, upon seeing or hearing emergency vehicles which are displaying flashing red lights and sounding audible electronic sirens, will immediately pull to the extreme right side of the road and come to a complete stop. When yielding to emergency vehicles, operators must keep well clear of intersections to provide room for large emergency apparatus.

g. No person, other than emergency personnel directly involved in an emergency operation, will attempt to follow fire apparatus or enter the general emergency area. At no time will any vehicle follow closer than 500 feet behind emergency apparatus. This is a minimum distance to insure the safety of personnel who could possibly fall from the responding emergency vehicle.

*23. MILITARY FAMILY HOUSING: 287 88

a. All portions of this regulation, as well as the following special precautions, are applicable to the family housing area.

b. Each newly assigned housing occupant will be presented a "Fire Prevention Kit" at the time they receive their prevention briefing.

c. Each occupant will be briefed and trained within thirty (30) days of occupancy. Random checks are conducted periodically thereafter. The military sponsor/spouse will be available at the scheduled time of visit to correct any hazards noted and to receive the indoctrination.

d. No construction or alterations to family quarters will be made unless the occupant has an approved Work Request (AF Form 332) in their possession. Request, signed by the military sponsor, containing detailed descriptions and sketch of work to be accomplished, will be submitted to the Base Civil Engineer for consideration, and must be coordinated by the Fire Department and Ground Safety. Request for wood panel installation will not be approved unless the material is Class A or B. Class A only for sleeping areas and exits.

e. Flammable liquids (gasoline, spray paint, thinners, cleaning fluid) will not be stored inside family quarters. Small amounts of flammables in approved metal containers, may be kept outside the building, well away from any source of ignition, or be maintained in the exterior storage closet provided. All flammables will be stored out of the reach of children.

f. Furnace room, water heater rooms, attics and crawlspaces will not be used for any type storage or habitation.

g. Clothes dryer filters and vent tubing will be cleaned by the occupant as required.

h. Pressurized containers for paint, polish, hair spray, etc, are extremely dangerous when subjected to open flame or excessive heat. Cans must be stored and used according to manufacturers instructions and must never be incinerated when empty.

i. Rags, paper, magazines and unnecessary storage will not be allowed to accumulate in the building but will be disposed of promptly.

j. Sponsors will insure that dependents are aware that a grease fire should be extinguished by covering with a lid or using the fire extinguisher provided, and oven fires should be extinguished by closing the oven, covering the burning material or using the fire extinguisher. No attempt should ever be made to carry an ignited pan from the building. Dependents should also understand that long unsecured hair and loose fitted clothing are hazardous around open flame or heating elements.

k. Deep fat cooking presents an extreme hazard. Under no circumstances will a deep fat fryer or substitute be turned on or placed on a stove and left unattended. These items will remain under constant supervision while in use. If it becomes necessary to leave the building, cooking appliances will be turned off.

l. Necessary action will be exercised at all times to insure children are aware of the hazards associated with playing with matches, lighters, fire and with the practice of "sneak smoking".

m. The military sponsor is the building custodian and is responsible for the fire-safe condition of the assigned quarters.

n. Air Force policy requires that persons be held liable for damages to government property caused by carelessness or negligent acts. When warranted, appropriate administrative or disciplinary action will be initiated. Obtaining renter's insurance is highly suggested.

o. 9-1-1 Stickers will be posted on or near each telephone.

p. All fires will be reported whether or not they can be or have been extinguished without the aid of the Fire Department.

q. When doing home cleaning, use only approved household cleaning agents. Read directions carefully! Do not mix incompatible cleaners.

r. Handloading equipment: All occupants wishing to use handloading equipment must receive approval from the Base Safety Office. Bulk gunpowder in excess of two (2) pounds will not be stored in the Family Housing area. Primers must remain in original cartons until used and will not be stored where one primer may touch another.

s. Storage or parking of gasoline powered equipment inside military family housing units is prohibited. Fuel operated equipment (motorcycles, lawn mower, etc) will not be parked where they will obstruct the path of egress.

t. Each housing occupant is responsible for insuring installed fire extinguishers are readily accessible for use, and are in serviceable condition at all times. If extinguishers are used or accidently discharged, it is the responsibility of the sponsor for exchanging it at the Self-Help Store, Building 1231.

24. VOQ, VAQ, TLF AND UEQ: 287 90

a. All portions of this regulation, as well as the following special precautions, are applicable to all living quarters on Carswell AFB. Only structures designated for billeting or quarters will be utilized for such; any exceptions will require written approval by the Base Fire Marshal.

b. No construction or alterations to any quarters will be made unless the occupant has an approved AF Form 332 in his/her possession. Requests containing detailed descriptions and sketch of work to be accomplished will be submitted to the Base Civil Engineer for consideration, and must be coordinated by the Fire Department and Ground Safety. Request for wood paneling installation will not be approved unless the materials are Class A or B. Class A only for sleeping areas and exits.

c. Storage or parking of gasoline powered equipment inside sleeping quarters is prohibited. Flammable liquids (gasoline, paints, thinner, cleaning fluid) will not be stored inside quarters.

d. Dryer lint bag, filters and vent tubing will be kept cleaned at all times.

e. Pressurized containers for paint, polish, hair spray, etc, are extremely dangerous when subjected to open flames or excessive heat. Cans must be stored and used according to manufacturers instructions.

f. Rags, paper, magazines and unnecessary storage will not be allowed to accumulate in the building but will be disposed of promptly.

g. Any container used for the disposal of smoking material will be non-combustible and emptied as needed. Containers will not be overfilled at any time.

h. 9-1-1 Stickers will be posted on or near each telephone.

i. All fires will be reported whether or not they can be or have been extinguished without the aid of the Fire Department.

j. When doing any cleaning, use only approved cleaning agents.

k. No fireworks, ammunition or reloading of ammunition will be allowed.

l. Cooking and burning of incense or candles is prohibited.

25. PETROLEUM, OIL, LUBRICATING (POL) STORAGE AND DISPENSING AREAS:

a. All vehicles operating or entering the POL storage area shall be equipped to comply with requirements stated in T.O. 38-1-23 and other pertinent directives. Civilian or privately owned vehicles entering the area will be strictly controlled to assure maximum safety conditions exist.

b. Refueling vehicles will be filled by the "bottom loading" method only.

c. Fuel transfers will be made only after all parts and containers have been effectively bonded and grounded.

d. Only nonsparking mowers will be used in the area for vegetation control.

26. FIRE EXTINGUISHERS:

a. Real property managers will insure that their personnel are receiving fire extinguisher training in accordance with paragraph 1.g. of this regulation.

b. Extinguishers will not be moved from assigned locations for any reason other than to combat a fire or for repair.

c. Real property managers or supervisors will be responsible for preventive maintenance of fire extinguishers located in facilities or designated work areas. This maintenance will consist of keeping extinguishers clean and insure they are not blocked from view or obstructed.

d. Aircraft maintenance supervisors having jurisdiction over exterior areas will assume responsibility for fire extinguishers placed there for the protection of parked aircraft, engine starts and aircraft upon which maintenance is being performed.

e. Recharging and repair of portable fire extinguishers will be accomplished by the Base Fire Department. The building custodian, supervisor or aircraft maintenance personnel are responsible to insure immediate delivery of damaged or used extinguishers from within their area of responsibility to the Fire Department for maintenance. The Fire Department will insure immediate repair is accomplished and the responsible person notified for extinguisher pick-up.

f. The using organization is responsible for the procurement, placement and inspection of portable extinguishers on mobile and stationary equipment. They will be delivered to the Base Fire Department for inspection, recharging and repair.

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g. Unit Commanders/Supervisors are responsible for notifying Fire Department supervisory personnel of changing conditions within structures involving the allocation of fire extinguishers.

h. Portable fire extinguishers must be maintained in accordance with applicable Technical Orders.

i. Portable fire extinguishers will be provided by the contractor during construction.

27. PENALTIES:

a. The provisions of this regulation are not intended to be punitive in nature. Violators are subject to action under the Uniform Code of Military Justice.

b. Commanders will initiate appropriate investigations and administrative or disciplinary action in instances of willful or negligent violations of the fire prevention standards contained in this regulation. Liability will be initiated in all cases where there is damage to government property, including family housing, caused by misconduct or negligence in fire prevention practices.

28. CONDITIONS NOT COVERED:

Fire safety problems not covered by this regulation will be resolved with common sense and good judgment by the Fire Protection Branch.

FOR THE COMMANDER

GEORGE A. DEGARD, CMSgt, USAF
Asst Chief, Information Management

3 Attachments
1. Contractors Checklist
2. Building Managers Checklist
3. Closing Checklist

SUMMARY OF CHANGES

Delete 117 reporting phone, change to 9-1-1. AF Form 1487 routing procedures. Add six part building managers fire protection folder and building manager's guide. Incorporates AFR 30-27 Smoking Policy. Explains pallet storage criteria. Changes procedures on AF Form 592. Expands flammable storage request letters. Deleted waste and packing material (incorporated into other section changes), plastics and films, and railway systems. Prohibits portable heaters in correctional and health care facilities. Requires hood/duct spare filters. Changes clearance on Bar-B-Que grills. Changes deep fat fryer test to semi-annual. Prohibits combustible festive decorations. Consolidates public assembly list. Provides sample checklist for closing inspection. Adds requirements for fireworks operator to be licensed. Sets random visits for base housing occupants. Suggests renter's insurance. Makes sponsor responsible for exchange of housing extinguisher. Reorganizes paragraphs and information to applicable sections. Changes contractor checklist to include storage trailers. Deletes reference to Foam and 'CB' fire extinguishers.

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CONTRACTOR FIRE PREVENTION

1. It is of the utmost importance that the elimination and/or control of fire hazards be strictly adhered to at all times. The following is a condensed version of Base Regulation 92-1 for private contractors. Call the Base Fire Department, 6334 or 6335, for clarification and fire prevention guidance. Engineering contract liaison personnel will insure contractors have a copy of this portion of CAFBR 92-1.

2. Any person who discovers a fire will report it immediately to the Base Fire Department by the most readily available means.

a. How to report a fire:

(1) Standard Telephones: Standard administrative telephones in offices and buildings may be used to report a fire by dialing "911" and giving information as follows: state your name and the location of the fire. If the building number of the building on fire is unknown, give the number of the nearest building to the fire or the name of the using organization; i.e., Hospital, Dental Clinic, Commissary, etc.

(2) Housing Area and other Commercial Telephones: To report a fire from any commercial telephone on base, dial fire emergency number "911", give name and location of fire.

3. Smoking:

a. All buildings are considered as no smoking unless marked otherwise.

b. No smoking, striking of matches, or operation of mechanical lighters will be permitted within fifty (50) feet of any aircraft on the flightline.

c. Receptacles provided for the disposal of smoking materials will not be used for the disposal of other waste material.

d. Ashtrays will be emptied into metal receptacles and wet with water or cold/safe before they are dumped into trash collection containers.

4. Housekeeping: Good housekeeping is of the utmost importance in eliminating fire hazards.

a. Waste paper baskets will be noncombustible and will be emptied at the close of the day.

b. Trash will not be allowed to collect inside any building. When waste paper baskets become full, they will be emptied into metal trash containers on the outside of the building. These containers will have covers and will be located at least ten (10) feet from the building.

c. Oily rags will be kept in covered metal containers.

d. Oily rags, grease, and paints will not be placed in containers with other combustibles.

e. Burning of rubbish or the use of open fires within the limits of the base is prohibited except when approved by the Base Fire Department.

5. Storage of Supplies:

a. In buildings having sprinkler systems, a clearance of 18 inches will be maintained at all times between storage and sprinkler heads.

b. Fire doors will be maintained clear of storage to insure that storage operation will not interfere with the operation of the doors.

c. Storage will not block or hide fire extinguishers, stairways, electric switch boxes, sprinkler valves, standpipes or other fire system apparatus.

6. Welding and Cutting:

a. Welding apparatus will be in good mechanical condition.

b. Work leads will be kept short. Leads overhead and conductors on floors or ground will be protected from damage or from passing personnel.

c. Electrodes will be removed from holder when not in use.

d. Power will be shut off and the unit disconnected during appreciable work stoppage.

e. Connections between regulators and cylinders will be gas tight.

f. Cylinders and fittings will be maintained free from grease and oil. Hose will be in good condition and not frayed, cracked, or spliced.

g. Gas cylinders will be stored in an upright position and will not be used as rollers or supports. Cylinders will be secured where there is no danger of being knocked over. Cylinder caps will be installed when not in use.

h. Oxygen cylinders will not be stored near acetylene or fuel gas cylinders. Empty and full cylinders will not be grouped together in storage.

i. Sheet metal guards, blankets, or similar protection will be provided to prevent hot metal and sparks from falling on wooden floors, partitions, or combustible materials which cannot be removed.

j. One person will be provided in the welding team whose sole responsibility will be to watch the falling sparks and promptly use the fire equipment if needed for all operations outside an approved welding shop.

k. During construction projects where welding and cutting is a continuous operation, a one time permit, AF Form 592, will be issued. It is not necessary to notify the Fire Department on a daily basis; however, notification is required for all other operations of this type outside an approved welding shop. Permits for noncontinuous welding and cutting operations will be issued on an individual basis. When welding operations are completed, the AF Form 592 is to be returned to the Base Fire Dept.

l. Welding operations should be stopped in sufficient time to allow a thorough check of the area before securing the job site.

7. Flammable/Combustible Liquids and Gases:

a. Flammable or combustible liquids such as paint, oil, gasoline, etc., will not be stored in any building except those buildings especially provided for such purposes.

b. At no time will there be more than one day's supply of paint and other flammables stored in buildings being renovated.

c. Paint and thinners will be stored in sealed containers.

d. At no time will gasoline or similar flammable liquids be used as cleaning agents.

e. Waste flammable or combustible liquids such as oil, gasoline, and hydraulic oil will not be drained into sewers or storm drains.

f. Flammable or combustible liquids will be stored at least ten (10) feet from any building or structure.

g. Flammable or combustible liquids will be stored or transported in approved metal containers and will be painted red with yellow band and with the contents plainly lettered on the side of each container.

h. Insure adequate ventilation is provided for any spray application.

8. Electrical Installation and Equipment:

a. Electrical equipment used in the vicinity of flammable gases and vapor will be of an approved explosion-proof type.

b. Double sockets and other electrical fixtures that tend to overload circuits will not be used.

c. Extension cords will be an approved heavy-duty type.

d. No cord will be nailed or stapled in place nor draped over pipes or other supports.

e. Flexible cord will be used only in continuous lengths without splices or taped sections.

f. Combustible materials will be kept away from electrical light fixtures at all times.

g. Electric coffee percolators and coffee urns must have a thermostatic control switch.

h. Electrical appliances which do not meet the specifications of the National Electrical Code will be removed.

i. Fuses will not be bridged in any manner.

j. Only non-metallic electrical plugs will be used.

k. Remove all sources of possible ignition when using spray application during construction process

9. Aisles and Exits:

a. Aisles will be clear at all times to give access to the Fire Department.

b. Space under stairways will not be used for storage.

c. Self-closing type fire doors will not be wedged, blocked, or hooked open.

10. Vehicle Parking:

a. Parking of vehicles, especially overnight parking, will be carefully regulated so that access to all sides of buildings and fire hydrants is not materially affected.

b. Vehicles will not be parked in buildings overnight, unless authorized for that purpose.

c. Parking is prohibited within a distance of fifteen (15) feet of any building except where surface parking areas are available and parking is authorized by the Chief, Security Police.

d. Parking will not be permitted within a distance of fifty (50) feet of aircraft hangars.

e. Vehicle parking within fifteen (15) feet of a fire hydrant is prohibited.

f. Vehicles operating in buildings must be approved by the Base Fire Chief.

g. Storage trailers. General purpose supply trailers will be parked with four foot clearance between each. Flammable material storage trailers will have ten foot clearance between themselves and other trailers. Adequate aisle space will be provided and the area will be maintained in a neat and orderly manner.

11. Hangars:

a. Electric motors, switches, fixtures, extension lights, and similar devices used within the hangar will be of an approved explosion-proof type where a fire or explosion hazard exists.

b. Only specially authorized vehicles will be permitted in hangars. All vehicles must be equipped with a suitable flashback spark arrestor and explosion-proof ignition system.

12. Fire Apparatus Priority:

a. Fire apparatus will have the right-of-way at all intersections, stop signs, and thoroughfares while on emergency movements on base.

b. Vehicles will keep clear of intersections upon hearing or seeing an emergency vehicle.

13. Use and Maintenance of Fire Extinguishers:

a. Classes of Fires:	Extinguisher to be used:
(1) Class A - Wood, Paper, Rags, etc.	Water

(2) Class B - Oil, Gasoline (Flammable Liquids)	CO_2, or Halon 1211, Dry Chemical
(3) Class C - Electrical Equipment and Appliances	CO_2, Halon 1211, Dry Chemical
(4) Class D - Metals	Dry Powder

b. Portable fire extinguishers will be provided by the Contractor during construction. Private contractors may make arrangements with Fire Protection Technical Service for fire extinguisher demonstrations for their personnel by dialing ext 6335.

c. Fire extinguishers located in buildings will not be removed from their location by other than Fire Department personnel except in the event of a fire.

d. The Base Fire Department will be notified immediately of extinguishers having been used or damaged and having broken seals. Seals are not to be broken unless actual use of fire extinguisher is deemed necessary.

14. It is of the utmost importance that at the end of the workday a responsible person be designated to make a thorough check of the area, so as to eliminate fire hazards. Some of the items to check are as follows:

a. Smoking materials.

b. Paint left in building.

c. Lights are off.

d. Electrical tools or appliances disconnected.

e. Rubbish and trash removed from building.

f. Oily or painter's clothing removed from building.

g. Flammable material removed from building.

REMARKS: In the interest of firefighter's safety, it is requested that heavy duty power leads into construction areas be equipped with a switch at point of origin and be turned off at the close of the workday.

FIRE PREVENTION GUIDE FOR FACILITY MANAGERS

This guide is designed to provide Facility Managers with information needed to establish and execute an effective Fire Prevention program in their area of responsibility.

1. TERMS EXPLAINED:

a. Area of responsibilty - The facility and open area adjacent to the facility assigned to an individual.

b. Fire hazard - Any condition or situation, if not corrected, could result in a fire. This is a situation which reduces personal safety and may be assigned a risk assessment code (RAC); i.e., overloaded extension cord, improper storage of flammable liquids, etc.

c. Fire prevention - Any action directed toward avoiding the start of a fire.

d. Fire safety deficiency (FSD) - A condition which reduces fire safety below acceptable levels including noncompliance with standards, but by itself cannot cause a fire. It could also increase the severity should a fire occur or delay in the detection and reporting of a fire; i.e., exit light out, blocked exit, inoperable smoke detector, etc.

2. RESPONSIBILITIES:

a. Insuring fire safe conditions in their area of responsibility.

b. Be familiar and comply with the fire prevention principles in the following directives:

(1) AFR 92-1, chapter 9.

(2) CAFBR 92-1.

(3) AFR 127-12.

3. DUTIES:

a. Perform fire prevention duty in a timely manner, to the best of your ability.

b. Take immediate action to correct fire hazards. Any fire hazards which cannot safely be corrected by yourself, contact the Fire Department at extension 6334/6335/6340.

c. Perform daily fire prevention inspection of your area (see atch 1).

d. Insure serviceability of all fire extinguishers assigned to your facility by performing a monthly inspection and annotating the date on an extinguisher log. The monthly inspection should include the following:

(1) Check for proper location and accessibility.

(2) Check gauge for proper pressure.

(3) Insure the pin and seal are in place.

(4) Check the cylinder for damage or corrosion.

(5) Check the hose and nozzle for damage.

e. Conduct training:

(1) Newly assigned personnel must receive training within 30 days after reporting for duty. Training should include the following:

(a) Fire reporting and location of pull stations.

(b) Personnel evacuation.

(c) Location and use of fire extinguishers.

(d) Safeguarding classified information.

(e) Hazards in their facility, or associated with their work.

(f) Fire protection features of your facility, i.e., halon system, sprinkler system, etc.

(2) Periodic:

(a) Fire drills as prescribed in CAFBR 92-1.

(b) Extinguisher training.

f. Insure the following actions are taken if a fire is discovered.

(1) The facility is evacuated.

(2) The Fire Department is notified on extension 9-1-1.

(3) Someone is available to direct fire fighters to the specific location of the fire.

g. Maintain a Fire Prevention folder with the following:

(1) CAFBR 92-1.

(2) Organizational O.I. on fire prevention program.

(3) Fire extinguisher log (see atch 2).

(4) Copy 2 of AF Forms 1487 from previous inspections.

(5) Training documentation for personnel under your responsibility.

(6) Miscellaneous documentation, i.e., work orders, waivers, etc.

h. Fire Inspections:

(1) Fire prevention inspections are periodic inspections made to every base facility to insure prescribed fire prevention practices are followed and to note any FSD's which may have occurred through building modification or change in occupancy.

(2) The facility manager or their alternate should accompany the Fire Prevention Inspector and insure the inspector is able to access all areas of their facility during the inspection.

(3) Walk-through inspections are conducted by the Fire Chief, Assistant Fire Chiefs, supervisors, and Technical Services personnel on a no notice basis.

(4) When the inspection is completed the person with the inspector will be briefed on the results and should inform the functional manager of the results.

(5) AF Form 1487 will be issued for a fire inspection:

(a) When hazards cannot be corrected on the spot (COS).

(b) When COS hazards are reoccurring.

(c) When a fire safety deficiency (FSD) is noted.

(6) AF Form 1487 will be sent through command channels:

(a) When COS hazards are reoccurring.

(b) When an effective fire prevention program has not been set up.

(c) When the facility manager is not enforcing fire prevention practices.

(d) When corrective action on noted hazards are delayed for an unreasonable time.

(7) When an AF Form 1487 is issued for an inspection the facility manager will keep copy 2, but it is the functional managers responsibility for seeing that copy 1 is properly annotated, signed, and returned to the Fire Department by the suspense date in block 4 (see atch 3).

287102

FIRE INSPECTION CHECKLIST

1. Fire Detection and Protection equipment:
   a. Are fire detectors and sprinkler heads clear for 18 inches?
   b. Are fire extinguishers and fire alarm pull stations visible and unobstructed?
   c. Does the equipment look in good condition?
2. Exits:
   a. Are exits clearly marked?
   b. Are bulbs in exit lights lit?
   c. Are the exit doors free opening?
   d. Are they unobstructed both inside and outside?
3. Electrical:
   a. Is all equipment and cords in good repair?
   b. Is equipment being used properly?
   c. Is unnecessary equipment turned off?
4. Building services:
   a. Check for natural gas and water leaks.
   b. Check condition of equipment and piping.
5. Building exterior:
   a. Check for excess vegetation.
   b. Is there 15 foot clearance around fire department sprinkler connection?
   c. Is there 15 foot clearance around fire hydrants?

SAMPLE

287103

ALL PURPOSE CHECKLIST	PAGE 1 OF 1 PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA CLOSING INSPECTION CHECKLIST	OPR / DATE

NO.	ITEM *(Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)*	YES	NO	N/A
1.	Was the facility inspected and left in a fire-safe condition at the close of business (or the end of duty shift), according to Base Reg 92-1?			
2.	Have all chairs, lounges and removable sofa cushions been removed and inspected for possible sources of ignition; ie, smoldering smoking material?			
3.	Have all smoking material receptacles been emptied into noncombustible containers with self-closing lids?			
4.	Have non-essential electrical appliances been disconnected?			
5.	Have all open flame heating devices been checked and turned off?			
6.	Have all rooms (including latrines and closets) been checked to make sure trash cans, smoking material containers, and other combustible debris have been placed in proper noncombustible containers? Are they at a safe distance and designated area outside the facility?			
7.	Have all doors and windows been closed and locked?			
8.	Has the entire building been checked to make sure unauthorized personnel are not present?			
9.	Have all pertinent directives (regulations and OI's) been complied with to leave the facility in a fire-safe conditon?			

SAMPLE

TAB

APPENDIX F

APPENDIX F

HEAT STRESS POLICY

POLICIES & PROCEDURES	SECTION A Health & Safety	NUMBER: 609
SUBJECT: Heat Stress		REVISION: 0
		ISSUED: 10/93
		PAGE 1 of 5

1. Purpose

To prevent heat stress related injuries during field work operations.

2. Scope

This policy applies to all divisions of AWT and its subsidiary corporations.

3. Policy

3.1 Heat stress controls shall be performed whenever operations are performed in ambient temperatures of $\geq$85°F for acclimatized individuals. For employees who are not acclimatized, heat stress controls may be needed at lower temperatures.

3.2 Appropriate measures shall be taken to prevent deep body core temperature from rising above 100.4°F.

4. Evaluation and Control

4.1 Heat stress shall be evaluated and controlled based upon measurement of environmental conditions and/or personal monitoring. Personal monitoring shall be used when operations require the wearing of full body personal protective equipment.

4.2 Measurement of Environmental Conditions

- Measurement of environmental conditions to evaluate and control heat stress shall be performed in accordance with the ACGIH TLV booklet section on heat stress. This method will require the use of a Wet Bulb Globe Temperature (WBGT) meter.

4.3 Personal Monitoring

- Personal monitoring to evaluate and control heat stress shall be performed in accordance with NIOSH/OSHA/USCG and EPA's Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Section 8, Personal Protective Equipment.

APPROVED BY:

5. Other Considerations

5.1 Employees shall be acclimated prior to performing work in heat stress situations.

5.2 Individuals experiencing vomiting or diarrhea or who have chronic cardiovascular diseases shall not perform activities in heat stress conditions until a medical approval is obtained.

6. Water and Salt Intake

6.1 Fluids shall be replaced approximately every 20 minutes in amounts of at least 150 mL (3.6L/Day).

6.2 Water shall be kept cool (50° - 60°F) throughout the operation.

6.3 Electrolyte replacement shall be in the form of a 0.1% salt solution in drinking water or commercial electrolyte replacement drink (i.e. Gatorade or equivalent).

7. Prevention

7.1 Strenuous physical activities should be scheduled at the beginning and end of the day when external temperatures may be cooler.

7.2 Potable water sprayers should be provided so that employees can cool down skin surfaces.

7.3 Provide cool rest areas and seating.

7.4 Provide whole body cooling devices such as ice vests with frozen packs or recirculation systems.

HEAT STRESS MONITORING AND PREVENTION WORK PRACTICE GUIDELINE

Exposure to temperature extremes places stress on the human body. The physiological strain that results from exposure often combined with work strain and fatigue to produce observable symptoms of heat stress. The following topics focus on methods for monitoring and preventing heat stress.

Prevention of Heat Stress

The education of employees is a key factor in heat stress prevention. Employees showing symptoms of heat stress must have reductions in heat loads, and they must be prevented from encountering additional heat loads.

According to NIOSH, OSHA, USCG, and USEPA, Working at Hazardous Waste Sites Manual 1985, the following are typical symptoms of heat stress.

- Heat rash from prolonged exposure to heat or humid air.
- Heat cramps characterized by muscle spasms and pain in the feet, abdomen, and hands. These symptoms are caused by inadequate electrolyte replacement when sweating is heavy.
- Heat exhaustion with symptoms such as dizziness; nausea; fainting; heavy sweating; and moist, cool, pale skin. This is caused by stress on body organs and includes poor blood circulation from insufficient cardiovascular function or dehydration.
- Heat stroke with symptoms such as absent or reduced sweat; hot, red, usually dry skin; dizziness and confusion, nausea, strong, rapid pulse, and coma. This is heat stress in its most extreme and serious form. Heat stroke indicates that the body's temperature regulation mechanism has failed and that the victim's temperature is rising to critically high levels. To prevent serious injury or death, act immediately to cool the victim's body. Call competent medical help!

Some measures to minimize the effects of heat stress include:

- Allow employees to become acclimatized to the work environment. Indications are that workers take 7 to 10 days to become acclimated to the heat.
- Rearrange site work schedules by instituting work slowdowns, working during cooler hours or at night, and adjusting work/rest periods according to heat stress monitoring results
- Maintain the normal body fluid levels of workers

- Provide employees with shaded rest areas or air-conditioned shelters
- Utilization of cooling devices to aid the natural body ventilation. Long cotton coveralls are suggested to absorb perspiration and to limit any contact with heat absorbing protective clothing
- Utilization of ice vests or equivalent are suggested to reduce body core temperature

Maintaining normal body fluid levels with regular fluid intake is one of the most important factors in heat stress prevention. Maintaining body fluid levels maintains adequate cardiovascular function. To maintain normal body fluid levels and body weight, a employee's fluid consumption should equal perspiration loss. Since the body's normal thirst response is an inadequate indicator of fluid loss, a regularly scheduled fluid intake program will be helpful in maintaining employees body fluid levels.

- Keep drinking cool water (50° to 60°F)
- Use 4-ounce disposable cups for water consumption
- Make employees drink at least 16 ounces of water before work starts
- Encourage employees to drink one to two cups of water every 15 minutes and/or during monitoring breaks
- Ask employees to drink more fluids if they are perspiring heavily
- Urge employees to consume at least 1 to 1.6 gallons of water or more per day for body weight maintenance

Monitoring for Heat Stress

The incidence of heat stress depends on a variety of factors, all employees even those not wearing protective equipment, should be monitored.

- For employees wearing permeable clothing (e.g., standard cotton or synthetic work clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of governmental Industrial Hygienists' (ACGIH) Threshold Limit Values for Heat Stress. If the actual clothing worn differs from the ACGIH standard ensemble insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.
- For employees wearing semipermeable or impermeable encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70°F (21°C).

287110

To monitor the employee, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.

  If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

  If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

  If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

  Do not allow the employee to continue work when his/her oral temperature exceeds 100.6°F (38.1°C).

AWT POLICIES & PROCEDURES	SECTION A Health & Safety	NUMBER: 610 287111
SUBJECT: Cold Stress		REVISION: 0
		ISSUED: 10/93
		PAGE 1 of 2

1. Purpose

To prevent cold stress related injuries during field work operations.

2. Scope

This policy applies to all divisions of AWT and its subsidiary corporations.

3. Procedure

3.1 General

Appropriate measures shall be taken to prevent deep body core temperatures from falling below 96.8°F and to prevent cold injury to body extremities.

3.2 Evaluation

Information shall be obtained either directly or indirectly as to the air temperature and wind speed at a site operation. The data shall be used to generate the equivalent chill temperature (ECT) as listed in the physical agents section of the ACGIH TLV booklet.

3.3 Controls

3.3.1 Whenever equivalent chill temperatures (ECT) fall below 20°F a ten minute warm-up break shall be provided after every 75 minutes of work.

3.3.2 If work is performed continuously in equivalent chill temperatures (ECT) of $\leq$ 20°F then heated warming shelters (Building or Vehicle) shall be made available.

3.3.3 Outdoor work activities shall be terminated whenever the equivalent chill temperature (ECT) is in the "Increasing Danger" or "Great Danger" regions. (see ACGIH TLV booklet)

3.4 Hand Protective Equipment

3.4.1 If work is to be performed with bare hands for more than 20 minutes in an environment $\leq$ 40°F, then warm airjets, radiant heaters or contact warm plates should be evaluated to keep workers' hands warm.

APPROVED BY:

3.4.2 Gloves shall be made available when air temperatures fall below 60°F for sedentary, 40°F for light, and 20°F for moderate work.

3.4.3 Mittens shall be worn whenever air temperatures fall below 0°F.

3.5 Total Body Protective Equipment

3.5.1 Total body protection is required when work is to be performed in environments with temperatures $\leq$ 20°F.

3.5.2 This body protection shall consist of clothing for the trunk and extremities and shall include an insulated head liner (providing head, ear and full face coverage), heavy socks, insulated steel-toed/steel-shank boots, insulated long underwear and insulated body coverall.

3.5.3 If there is potential for clothing to become wet, then the outer layer of clothing shall be water repellent.

3.5.4 If body clothing is insufficient in preventing the sensation of cold or frostbite, then work activities shall be terminated until more appropriate clothing is obtained or weather conditions improve.

3.6 Other Considerations

3.6.1 Shield the immediate work area with vehicles or tarps to reduce the cooling effects of the wind.

3.6.2 Individuals suffering from diseases or who are taking medication which interferes with normal body temperature regulation shall not be allowed to work in temperatures $\leq$ 30°F. Employees shall notify supervision when these conditions exist.

3.6.3 Protective clothing that becomes wet from either contact with water or due to sweating greatly reduces insulating properties and therefore shall be immediately replaced.

TAB

APPENDIX G

APPENDIX G

SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

287115

SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

By my signature, I certify that I have read, understand, and will abide by, the Site Health and Safety Plan for England Air Force Base and Carswell Air Force Base. I also certify that all health and safety training and medical surveillance requirements which may be applicable to my employment at this site are current and will not expire during onsite activities.

Signature	Printed Name	Company	Date

TAB

APPENDIX H

APPENDIX H

PPE INSPECTION AND MAINTENANCE PROGRAM

E.1 Cleaning and Disinfecting Air Purifying Respirators (APR)

APRs in routine use should be cleaned and disinfected at least daily. Where respirators are used only occasionally, or when they are in storage, the cleaning interval is weekly or monthly, as appropriate.

E.1.1 Daily Cleaning Procedure. The steps to be followed for cleaning and disinfecting daily are as follows:

- Respirator Disassembly. Respirators are taken to a clean location where the filters, cartridges or canisters are removed, damaged to prevent accidental reuse, and discarded. For thorough cleaning, the inhalation and exhalation valves, speaking diaphragm, and any hoses are removed.

- Cleaning. In most instances, the cleaning and disinfecting solution provided by the manufacturer is used, and is dissolved in warm water in an appropriate tub. Using gloves, the respirator is placed in the tub and swirled for a few moments. A soft brush may be used to facilitate cleaning.

- Rinsing. The cleaned and disinfected respirators are rinsed thoroughly in water to remove all traces of detergent and disinfectant. This is very important for preventing dermatitis.

- Drying. The respirators may be allowed to dry in room air on a clean surface. They may also be hung upside down like drying clothes, but care must be taken not to damage or distort the facepieces.

- Reassembly and Inspection. The clean, dry respirator facepieces should be resembled and inspected in an area separate from the disassembly area to avoid contamination. Special emphasis should be given to inspecting the respirators for detergent or soap residue left by inadequate rinsing. This appears most often under the seat of the exhalation valve, and can cause valve leakage or sticking.

E.1.2 After Routine Use in Exclusion Zone. The steps to be followed for cleaning and disinfecting in the field are as follows:

- The mask may be washed/rinsed with soap and water.

- At a minimum, the mask should be wiped with disinfectant wipes and allowed to air dry in a clean area.

E.2 APR Inspection and Checkout

1. Visually inspect the entire unit for any obvious damages, defects, or deteriorated rubber.

2. Make sure that the facepiece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.

3. Inspect lens for damage and proper seal in facepiece.

4. Exhalation Valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).

5. Inhalation Valves (two) - screw off cartridges/canisters and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.

6. Make sure a protective cover lens is attached to the lens.

7. Make sure the speaking diaphragm retainer ring is hand tight.

8. Make sure that you have the correct cartridge.

9. Don and perform negative pressure test.

E.3 Storage of Air Purifying Respirators

OSHA requires that respirators be stored to protect against:

- Dust
- Sunlight
- Heat
- Extreme cold
- Excessive moisture
- Damaging chemicals
- Mechanical damage

Storage of respirators should be in a clean, secure area which minimizes the chance for contamination or unsanitary conditions.

E.6 Personal Protective Clothing

E.6.1 Inspection. Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and its frequency of use. The different levels of inspection are as follows:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use or training and prior to maintenance.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The primary inspection of PPE will occur prior to immediate use and will be conducted by the user. This ensures that the specific device or article has been checked-out by the user, and that the user is familiar with its use.

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - Imperfect seams
  - Non-uniform coatings
  - Tears
  - Malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
  - Observe for cracks
  - Observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - Discoloration
  - Swelling
  - Stiffness

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure.

- Tears.
- Punctures.
- Seam Discontinuities.

GLOVES

Before use:

- Visually inspect for:
  - Imperfect seams
  - Tears, abrasions
  - Non-uniform coating
  - Pressurize glove with air; listen for pin-hole leaks.

TAB

APPENDIX I

APPENDIX I

DAILY RECORD OF HAZARDOUS WASTE FIELD ACTIVITY

DAILY RECORD OF HAZARDOUS WASTE FIELD ACTIVITY 28712

Site Name _____

Period of Activities(Date) _____
WA# _____

Tasks _____

Site Health & Safety Officer/Alternate _____
Highest Airborne Conc./Monit. Instrument _____
Average Airborne Conc./Monit. Instrument _____

Employee Name	Total Hours onsite	Hours/Level B	C	D	Activities Performed While Onsite

TAB

APPENDIX J

APPENDIX J

DIRECT READING INSTRUMENT DESCRIPTIONS

DIRECT READING INSTRUMENT DESCRIPTIONS

The applicability and use of the air monitoring equipment to be used to monitor the health and safety conditions are given below. The sampling methods used will follow NIOSH and/or EPA criteria.

Instrument: Photo-ionization Detector (PID)

Hazard Monitored: Many organic gases and vapors.

Application: In survey mode, detects the concentration of many organic gases and vapors. In gas chromatography (GC) mode identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated.

General Care/Maintenance: Recharge or replace battery. Perform routine maintenance as described in the manual. Check for leaks.

Typical Operating Time: 8 hours; 3 hours with strip chart recorder.

Instrument: Combustible Gas Indicator (CGI)

Hazard Monitored: Combustible gases and vapors.

Application: Measures the concentration of a combustible gas or vapor.

Detection Method: A filament, usually made of platinum, is heated by burning the combustible gas of vapor. The increase in heat is measured. A current is produced in proportion to the number of carbon atoms present.

General Care/Maintenance: Recharge or replace battery. Calibrate immediately before use.

Typical Operating Time: Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.

Instrument: Oxygen Meter

Hazard Monitored: Oxygen (O_2)

Application: Measures the percentage of O_2 in the air.

Detection Method: Uses an electrochemical sensor to measure the partial pressure of O_2 in the air, and converts that reading to O_2 concentration.

General Care/Maintenance: Replace detector cell according to manufacturers recommendations. Recharge or replace batteries prior to expiration of the specified interval. If the ambient air is more than 0.5% CO_2, replace the detector cell frequently.

Typical Operating Time: 8-12 hours.

Instrument: Ludlum Model 3 Survey Meter with 44-2 and 44-9

Hazard Monitored: External whole body radiation.

Application: Meter can be operated to perform scaled one minute counts, or operated to give a count rate. *Multiple probes may be used with the meter. Generally the instrument should be used in count rate mode. If elevated count rates are detected a scaled one minute count may be performed.

General Care/Maintenance: Replace battery. Perform routine maintenance as described in the manual. Function check daily.

Typical Operating Time: 8-10 hours.

Instrument: Ludlum 44-9 with Air Prop. Probe

Hazard Monitored: Alpha, Beta and Gamma contamination.

Application: Used to frisk soils, equipment, and personnel to determine the presence of radioactive contamination. Multiple probes may be used with the 44-9.

General Care/Maintenance: Replace battery. Perform routine maintenance as described in the manual. Function check daily.

Typical Operating Time: 8-10 hours.

Instrument: Model 2000 with 43-10

Hazard Monitored: Alpha particulate contamination.

Application: Used as a portable smear and/or air sample counter.

General Care/Maintenance: Replace battery. Perform routine maintenance as described in the manual. Function check daily. Never transport instrument with planchet in tray.

Typical Operating Time: 20-25 hours.

Instrument: Ras-1 Air Sampler

Hazard Monitored: Airborne alpha and/or beta contamination.

Application: Area air samples can be relocated over a several hour or work shift time period. A power source is required for use.

General Care/Maintenance: Replace battery. Perform routine maintenance as described in manual.

Typical Operating Time: Variable.

TAB

APPENDIX K

APPENDIX K

ACCIDENT/INJURY INVESTIGATION REPORT FORM

28713

ACCIDENT/INJURY INVESTIGATION REPORT FORM

Date of Incident: _____

Location of Incident: _____

Time of Incident: _____

Date of Report: _____

Personal Injury: _____

_____

_____

_____

Property Damage: _____

_____

_____

_____

Description of Incident: _____

_____

_____

_____

_____

_____

Causes (Minimum of 2): _____

_____

_____

Corrective Actions:

Actions	Responsibility	Date of Completion
_____	_____	_____
_____	_____	_____
_____	_____	_____

Investigated by: _____

_____

_____

Written by: _____ Date: _____

Reviewed by: _____ Date: _____

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE