HUMAN FACTORS APPLICATIONS, INC.
Buckingham Green. 4950 Route 202, Bldg. #1, Suite 2A
Holicong, Pennsylvania 18928-0615

13 January 1998
HFA Serial Number: 019-653

US Army Engineering and Support Center, Huntsville
CEHNC-OE-EM
4820 University Drive
Huntsville, AL 35816

ATTN: Mr. David Shafii

Subj: DACA87-94-D-0019, T. O. 0020 and DACA 87-95-D-0027, T. O. 0019 ; Dolly Sods, WV, Work Plan and SSHP

Dear Mr. Shafii:

All comments to the Work Plan have been addressed. Ten copies of the Work Plan are hereby addressed to your office. Additional copies were distributed IAW the Scope of Work.

F. A. Kittle
Project Manager

encl.
cc:
Mr. Richard Meadows, Huntington District, USACE (2 copies)
Potomac Ranger District, Elizabeth Schuppert, Supervisor, Petersburg, WV (3 copies)
Mr. Lynn Hicks, Supervisor's Office, Monongahela National Forest, Elkins, WV (3 copies)

Human Factors Applications, Inc.
ORDNANCE & EXPLOSIVE WASTE REMEDIATION
4950 Route 202, Building 1 Suite 2A, Holicong, PA 18928-0615

ORDNANCE REMOVAL ACTION

DOLLY SODS
WORK PLAN

(Updated to Include North Dolly Sods)

CONTRACT NUMBER:	DACA87-94-D-0019
DELIVERY ORDER:	#0020
CLIENT NAME:	U.S. Army Corps of Engineers
PRIME CONTRACTOR:	Human Factors Applications, Inc.
PROJECT TITLE:	Ordnance Removal Action
PROJECT LOCATION:	Dolly Sods, West Virginia

Date Prepared: 12 JAN 98 **Prepared By:**

Floyd A. Kittle, Project Manager

TABLE OF CONTENTS

CHAPTER 1
OVERVIEW

1.1 INTRODUCTION

1.1.1 Human Factors Applications, Inc. (HFA) is under contract to the U. S. Army Engineering and Support Center (CEHNC), Huntsville, Alabama, to provide unexploded ordnance (UXO) services for the former West Virginia Maneuver Area, located in the Dolly Sods Wilderness and Dolly Sods North areas [see Statement of Work]. This Work Plan (WP) and Site-Specific Health and Safety Plan (SSHP) [see Appendix B] describe the overall scope of the project, the general methodology to be used, and the specific UXO site requirements. The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS). Ordnance and explosives (OE) exist on property formerly owned by the Department of the Army.

1.1.2 Explosive ordnance is a safety hazard and constitutes an imminent and substantial endangerment to site personnel and the local populace. During this removal action, it is the Government's intent that Human Factors Applications, Inc. destroy, by detonation on-site, all Unexploded Ordnance (UXO) encountered. This action will be performed in accordance with (IAW) the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA), Section 104 and the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required. This ordnance removal action does not fall under the RCRA hazardous waste management requirements.

1.1.3 Per Department of the Army Policy, the applicable provisions of 29 CFR 1910.120 apply.

1.1.4 Due to the inherent risk in this type of operation, HFA will limit its workers to a 40-hour work week: either five 8-hour days or four 10-hour days. UXO personnel shall not perform UXO-related tasks more than 10 hours per day.

CHAPTER 2
BACKGROUND

2.1 The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness and Dolly Sods North Areas. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training as well as a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit the Dolly Sods Area annually. The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

2.2 The removal action in the Dolly Sods Wilderness Area pertains to 20.89 miles of trails, five acres of wooded land off Rocky Point Trail and 101 campsites that are commonly used and are designated by the U.S. Forest Service. The total to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111. 9 acres for trails and 2.0 acres for campsites.

2.3 The removal action in the Dolly Sods North Area pertains to 23 miles of trails, a total of 98.9 acres of open land, and 75 campsites. Additionally, three cabin sites and a dump site will be remediated to a depth of four feet. The Forest Service will remove all trash and the cabins prior to remediation of these sites. The cabin sites and dump site will not be remediated until the USFS receives National Environmental Policy Act (NEPA) approval and HFA is ordered to act by the CEHNC Project Manager. The total area to be cleared of surface and subsurface OE is approximately 216.3 acres. This is further divided into 114.3 acres for trails, 98.9 acres of open land and 3.1 acres for campsites, cabin sites and dump site.

2.4 OBJECTIVE

2.4.1 Human Factors Applications will safely locate, recover and dispose of all surface and subsurface ordnance and explosives (OE) to a depth of one foot beneath all trails (to include a width of 20 feet on each side of the trails) and open land and to a depth of four feet beneath designated camping areas, cabin sites, and trash dump.

2.4.2 HFA has prepared this Work Plan and Site Specific Safety & Health Plan to accomplish that objective. We will investigate, identify, and dispose of all OE and OE related scrap located during the project. HFA will perform surface and subsurface surveys of each area indicated in the SOW and dispose of all UXO located. Upon completion of the project, HFA will submit a final report which details the events and documents the areas cleared and significant findings.

2.5 The site maps located at Appendix C generally describes the location of each site, and shows Dolly Sods overall location.

CHAPTER 3
SITE CONDITION

3.1 The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness and Dolly Sods North Areas. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training as well as a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit the Dolly Sods area annually.

3.2 The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance. Iron bearing rock was discovered in almost every area and was common throughout the Dolly Sods Area. Non UXO materials were generally concentrated in areas where past human activities had occurred and where present human activities currently take place. Ordnance was found in northern Dolly Sods, in the Breathed Mountain region, and in the Red Creek flood plain adjacent to Breathed Mountain.

3.3 Because the sites are isolated and the use of motorized equipment is not authorized , emergency support services will not be immediately available. Adequate support is available from several local jurisdictions. The Davis Memorial Hospital, in Elkins will be the primary emergency response for accident victims, the U. S. Forest Service will provide fire fighting and police support within the Dolly Sods Area. The Grant County Emergency Communication Center will be relied upon to coordinate emergency support if the event primary sources are unable to respond.

3.4 DOLLY SODS WILDERNESS AREA. Each site is described in the following paragraphs. Figure 3-1 depicts the general configuration of the areas listed in paragraph 3.4.1 through 3.4.9. Campsites vary in size and the width of hiking trails vary from a narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one feet to include 20 feet on either side of the trail as terrain and vegetation permit. Each campsite will be subsurface cleared to a depth of 4 feet. The five acres of wooded land off Rocky Point Trail will be cleared to a depth of one foot. Working in these areas requires close coordination between the on-site Forest Service and COR representatives and HFA's SUXOS. No brush and tree cutting, trimming or clearance will be done on this site except as approved by Forest Service personnel. Areas where the brush is too thick to penetrate and efficiently sweep will be left undone and appropriately marked on their respective grid sheets.

3.4.1 Area 1. 4 campsite, 2.35 miles of trails. Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

3.4.2 Area 2. 2 campsites, 1.05 miles of trails. Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

3.4.3 Area 3. 1 campsite, 0.44 miles of trails. Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsites 2.4 acres trails.

3.4.4 Area 4. 5 campsites, 1.63 miles of trails. Total area acreage is 767. Maximum clearance acreage 0.07 acres campsites. 8.9 acres trails.

3.4.5 Area 5. 41 campsites, 7.88 miles of trails. Total area acreage is 1.565. Maximum clearance acreage: 0.60 acres campsites 43 acres trails.

3.4.6 Area 6. 21 campsites, .34 miles of trails. Total area acreage is 2.156. Maximum clearance acreage: 0.30 acres campsites; 18.2 acres trails.

3.4.7 Area 7. 5 campsites, 0.69 miles of trails. Total area acreage is 282. Maximum clearance acreage: 0.07 acre campsites; 3.8 acres trails.

3.4.8 Area 8. 15 campsites, 2.50 miles of trails. Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites. 13.6 acres trails.

3.4.9 Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0. 1 acres campsites; 5.5 acres trails.

3.5 DOLLY SODS NORTH AREA. The area to be cleared is described in this paragraph. Figure 3-2 depicts the general form of the area. Campsites vary in size and the width of hiking trails vary from a narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one foot to include 20 feet on either side of the trail. Each campsite will be subsurface cleared to a depth of 4 feet. The area around the three cabin sites and the dump site will be cleared to a depth of four feet. After the cabins are torn down, the cabin site itself will be remediated to a depth of four feet. The 98.9 acres of open land will be cleared to a depth of one foot. Working in these areas requires close coordination between the on-site Forest Service and COR representatives and the HFA SUXOS. No brush and tree cutting, trimming or clearance will be done on this site except as approved by the Forest Service representative; areas where the brush is too thick to penetrate and efficiently sweep will be left undone and appropriately marked on their respective grid sheets.

Figure 3-1

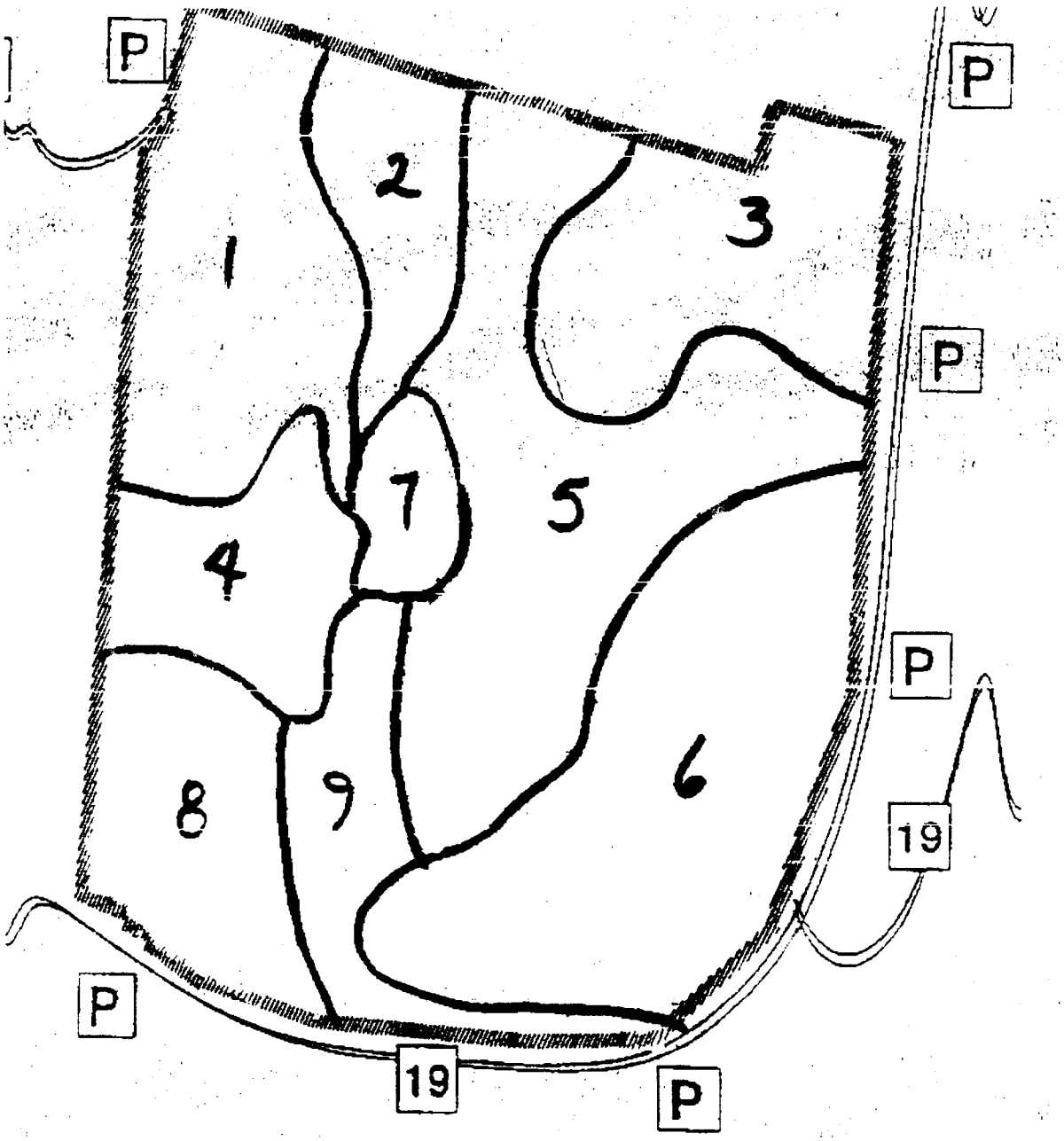


Figure 3-2

DOLLY SODS NORTH

CHAPTER 4
UXO OPERATIONS PLAN

4.1 GENERAL SITE OPERATIONS

4.1.1 All UXO operations will be performed in accordance with CEHNC's Basic Concepts & Safety Considerations for UXOs [see Appendix D].

4.1.2 This work plan pertains to the clearance of 20.89 miles of trails, approximately 5 acres of wooded land and 101 campsites located within the Wilderness area. A total of approximately 113.9 acres will be cleared in the Wilderness area. This work plan also pertains to an additional 23 miles of trails, 75 campsites, and 98.9 acres of open land, the area around and under three cabin sites and a dump site, located in North Dolly Sods. The cabins will be torn torn down and removed by the US Forest Service. All trash from the dump site will be removed by the US Forest Service. A total of approximately 216.3 acres will be cleared in North Dolly Sods.

4.1.3 HFA will begin operations on the south end of Red Creek trail just inside the Wilderness Area, in accordance with agreements made between the CEHNC PM, Mr. Bill Sargent, and Forest Service representatives during the site visit. Priorities and the order of operations are subject to change. After the Red Creek trail is completed, the other areas will be completed as required by US Forest Service officials. If the need arises to change priorities, theSUXOS will be notified in advance. Each designated site will receive an investigation and clearance as outlined in this work plan and Task 4 of the SOW. All subsurface anomalies will be excavated to a depth of **one foot** beneath and 20 feet to either side (measured from the centerline) of all trails. The five acres of wooded land off Rocky Point Trail will be remediated to a depth of ***one foot***. Additionally, all subsurface anomalies will be investigated to a depth of **four feet** beneath all inventoried camping areas, the area around the three cabin sites and the dump site. All subsurface anomalies will be excavated to a depth of one foot beneath the 98.9 acres of open land. Deeper excavations will be undertaken only with the approval of the CEHNC on site Safety Specialist.

4.1.4 The purpose of this project is to locate, excavate, and remove or destroy all UXO discovered in the project area. Each grid in the subsurface area will be swept with a Schonstedt Magnetometer and 100% of the contacts will be excavated or identified. All excavations of anomalies will be completed by hand. All UXO that are discovered will be detonated in place or within the site where they were found, IAW Instructions for Protection of the Cheat Mountain Salamander (CMS).

4.1.5 Potential exposure to CWM materials on this site is not anticipated. If HFA UXO personnel encounter any UXO that cannot be positively identified as a conventional UXO, HFA personnel will withdraw from the site and request assistance from the nearest Technical Escort Unit (TEU) through the on site CEHNC Safety Specialist. HFA personnel will take emergency non-invasive actions such as covering the item with plastic sheeting and securing the area until Forest Service personnel and TEU can establish the appropriate exclusion and safety zones.

4.2 DETERMINING BOUNDARIES & ESTABLISHING SEARCH GRIDS/LANES

4.2.1 SITE SPECIFIC OPERATIONS

4.2.1.1 The overall site boundaries have been determined by the information collected during the previous Sampling Action, the Archives Search Report, and the SOW.

4.2.1.2 Individual grids will be established as outlined in Chapter 7 of this WP. The grid team will be responsible for locating and establishing the corners of each grid. The UXO team assigned to search and clear a grid will be responsible for establishing search lanes within each grid. All grids will be laid out with five foot search lanes, oriented north to south. The southwest corner stake will be conspicuously painted and marked with that grid's identification number.

4.2.1.3 The team's UXO Supervisor (UXOS) will be responsible for plotting and recording UXO and other significant contacts located within each grid. Significant contacts/points are identified and explained in para 7.3.4. All contacts will be plotted using the Southwest Corner Stake as the prime reference point . All plots will be recorded on the HFA UXO Grid Location Form [*see Appendix E*]. An XYZ coordinate system will be used to plot each contact. The Y coordinate will be measured from the southern boundary line of the grid in a northerly direction, and the X coordinate will be measured from the western boundary in a easterly direction. The Z coordinate will be recorded as the depth at which the contact was located.

4.2.1.4 If a UXO is located and later detonated in-place, the UXOS will indicate that the UXO was detonated at that point on the grid sheet.

4.2.1.5 Because of the very long walking distances to and from the work area/s, a dedicated effort will be made in order to schedule clearance operations in a way that will reduce "backtracking" to an absolute minimum.

4.2.1.6 In order to facilitate the efficient scheduling of work efforts, a weekly planning meeting will be conducted with Forest Service and COR representatives in attendance.

4.2.1.7 A Forest Service representative will be on site at all times during clearance operations. This representative, will for the most part, be working with the SUXOS or SSO well ahead of clearance teams, marking the boundaries of campsites and culturally significant areas. This individual will remain outside the Restricted Area while intrusive operations are under way.

4.2.1.8 A representative of the COR will be on site at all times. This representative will remain outside of the Restricted Area while intrusive operations are under way.

4.2.1.9 Due care will be exercised while driving on Forest Service roads during the winter months. Forest Service roads are not plowed during the snow season.

4.2.2 UXO SITE OPERATIONS

4.2.2.1 The order of site operations and the location and boundaries of each site were determined by the CEHNC, Forest Service representatives and information gained during the site visit. The order and priorities of operations may be modified by notice of the CEHNC PM, his representative, or by proper Forest Service officials.

The Dolly Sods Wilderness and Dolly Sods North areas will not be closed during UXO/OE operations. Trails and/or portions of trails will be posted and blocked; as appropriate, during clearance operations in order to limit public access.

4.2.2.2 Dolly Sods Wilderness Areas.

4.2.2.2.1 Area 1 consists of four campsites and 2.35 miles of trails. Maximum clearance acreage: 13.4

4.2.2.2.2 Area 2 consists of two campsites and 1.05 miles of trails. Maximum clearance acreage: 5.73

4.2.2.2.3 Area 3 consists of one campsite and .44 miles of trails. Maximum clearance acreage: 2.41

4.2.2.2.4 Area 4 consists of five campsites and 1.63 miles of trails. Maximum clearance acreage: 8.97

4.2.2.2.5 Area 5 consists of 41 campsites and 7.88 miles of trails. Maximum clearance acreage: 43.6

4.2.2.2.6 Area 6 consists of 21 campsites and 3.34 miles of trails. Maximum clearance acreage: 18.5

4.2.2.2.7 Area 7 consists of five campsites and .69 miles of trails. Maximum clearance acreage: 3.87

4.2.2.2.8 Area 8 consists of 15 campsites and 2.50 miles of trails. Maximum clearance acreage : 13.82

4.2.2.2.9 Area 9 consists of seven campsites and 1.01 miles of trails. Total clearance acreage : 5.6.

4.2.2.2.10 DOLLY SODS NORTH AREA.

4.2.2.2.11 The area to be cleared is described in this paragraph. Figure 3-2 depicts the general form of the area. Campsites vary in size and the width of hiking trails vary from a

narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one foot to include 20 feet on either side of the trail. Each campsite will be subsurface cleared to a depth of 4 feet. The three cabin sites and the dump site will be cleared to a depth of four feet. The 98.9 acres of open land will be cleared to a depth of one foot. Working in these areas requires close coordination between the on-site Forest Service and COR representatives and the HFA SUXOS. No brush and tree cutting, trimming or clearance will be done on this site except as approved by the Forest Service representative; areas where the brush is too thick to penetrate and efficiently sweep will be left undone and appropriately marked on their respective grid sheets.

4.2.2.3 GENERAL SITE OPERATIONS

4.2.2.3.1 HFA will establish temporary control based on the data provided by CEHNC. This control will be used by HFA personnel to layout and establish the grid network. The number and locations of the control will be determined by the size and shape of the site.

4.2.2.3.2 Grids will be established prior to clearance operations. Grids will generally be 100ft X 200ft, but the size and shape may be altered by the SUXOS to best fit the area being investigated. The goal is to perform an effective subsurface search and removal.

4.2.2.3.3 No trees, brush or any other type of vegetation will be cut or trimmed without the permission of the Forest Service representative.

4.2.2.3.4 No spray paint of any kind will be allowed within the Dolly Sods Area. Spray chalk will be used.

4.2.2.3.5 Grid layout for the trails and campsites will be irregular and sized to fit each specific location. Subsurface removal locations will be marked with red flags or flagging tape at intervals which clearly indicate the area to be cleared, and they will not be removed until the area has received a satisfactory QC and QA Check.

4.3 SEARCH ACTIVITIES

4.3.1 SURFACE SEARCHES

4.3.1.1 Surface searches are necessary if subsurface magnetometer searches are to be effective. Surface searches are normally conducted simultaneously with subsurface operations; however, if a site o grid is heavily contaminated with surface metallic debris, removal of the surface debris will be accomplished first.

4.3.2 SUBSURFACE SEARCHES

4.3.2.1 All grids in the areas designated for subsurface removal will receive a 100% subsurface search using government furnished Schonstedt Magnetometers. All subsurface anomalies will be excavated, classified and identified if possible, their positions will be recorded as outlined in

Chapter 7. Anomalies identified as UXO requiring in place destruction will be marked with red and yellow flags for destruction at the end of the day.

4.3.2.2 Grid search lanes will be established in a north/south direction whenever possible. Sweep lanes will be marked with 1/4 inch line and will be no wider than five feet. Each lane will be swept as described above.

4.3.2.3 The UXOS will record the X, Y and Z coordinates of all explosive ordnance located in each grid. Additionally, the locations of all CMS and undocumented archaeological and cultural sites will be plotted.

4.3.2.4 No trees, brush or other vegetation will be cut or trimmed anywhere within the Dolly Sods Area without the permission of the Forest Service representative.

4.3.2.5 All subsurface searches will be conducted in accordance with Operational Instructions for protection of the Cheat Mountain Salamander (CMS) in Chapter 8.

4.3.3 RECORDING SITE DATA

4.3.3.1 Each UXOS will provide a detailed accounting to the Quality Control Officer of all ordnance, ammunition, explosive items, components, and scrap encountered in each grid. This accounting will include the quantity, type, depth, condition, and final disposition of all items in each grid. Significant items will be recorded as described in Chapter 7 using the UXO Grid Location Form (grid sheet) shown in Appendix E.

4.3.3.2 Completed grid sheets will be turned over to the QCO at the end of each work day. The QCO will verify the completeness of each grid sheet before it is transferred to the site data base. Any corrections or clarifications will be made at that time. The grid markers will not be removed until all grids have received a QC check by the HFA QC Officer and QA certification by the CEHNC on site QA/Safety Specialist.

4.3.4 INTRUSIVE OPERATIONS

4.3.4.1 Excavations will only be performed by qualified UXO personnel. If the UXO Supervisor cannot immediately identify the UXO, he will request assistance from the QCO or SSO.

4.3.4.2 All intrusive operations will be accomplished in accordance with Operational Instructions for protection of the Cheat Mountain Salamander (CMS) in Chapter 8. All artifacts will be returned to their original locations.

4.3.4.3 Subsurface contacts will be uncovered by hand. If a contact proves to be non-UXO , it will be removed and the hole rechecked with a magnetometer. If the contact is UXO, it will be classified and identified. If the contact is an artifact, it will be returned to the hole. All holes will

be refilled IAW instructions for protection of the Cheat Mountain Salamander in Chapter 8.

4.3.4.4 If the UXO is safe to move, it may be moved by hand and consolidated with other UXO in the same grid for destruction. At no time will UXO be moved to or from any other area or grid.

4.3.4.5 All unsafe to move UXO located will be marked with crossed red and yellow flags, and destroyed in place. In order to conserve explosives and setup time, and if the UXO are safe to move, they may be consolidated within a grid for destruction. Because of the anticipated schedule, detonations may be scheduled late in the work day. In no case will UXO remain over night unless appropriate security is posted.

4.3.5 RESTRICTED AREAS

4.3.5.1 Restricted Areas will be established at each work site, since the work sites are large, and the boundaries are irregular, a single Restricted Area is impractical. The boundaries of the Restricted Area will change frequently, if not daily. Assistance will be sought from the on site Forest Service representative if unauthorized persons enter the site and do not voluntarily leave the area.

4.3.5.2 The Restricted Area will encompass the area of activity of each search team. The Restricted Area will be based upon the **maximum credible event** *(See Para 1-3, SSHP)*. Access to the site will be through the support zone at the site office. Only HFA UXO personnel and CEHNC Safety Representatives will be authorized to be within a Restricted Area during UXO and demolition operations. When non-UXO personnel are on site, they will be escorted by a UXO person. UXO operations will cease before non-UXO personnel are allowed into a Restricted Area. All persons entering or leaving the site will check in and out with the guard at the communications trailer, which is located at the Bell Knob Tower.

4.3.5.3 At least a 200 feet separation will be maintained between teams during UXO operations. This separation distance may be increased if a UXO is located and requires greater separation distance.

4.3.6 PERSONAL PROTECTIVE EQUIPMENT

4.3.6.1 Personal Protective Equipment (PPE) will be maintained at a level deemed appropriate to protect UXO personnel, CEHNC personnel, and other workers. Normal work clothing will be worn and it will include long trousers, shirts, leather gloves, leather work boots (w/o steel toes), and safety sunglasses. A sturdy pair of hiking boots are recommended. A hat is optional, but strongly recommended, for protection from the sun. Hard hats are required if a potential head injury could result from an overhead hazard.

4.3.7 SCRAP REMOVAL

4.3.7.1 Scrap removal is essential in order to successfully complete the subsurface magnetometer survey of each grid. Non UXO scrap will not be removed from any areas/grids. Scrap is defined as metallic debris which is not contaminated with explosives. The scrap could be made up of UXO related material as long as:

4.3.7.2 The case is vented and a mechanical rupture could not occur if the item were placed in a melting furnace and the item has been internally inspected to determine that it does not contain explosives or explosive residue.

4.3.7.3 All scrap will be carefully inspected by the Search Team UXOS to ensure that it does not contain any explosives or explosive residue.

4.3.7.4 UXO Scrap will be staged in an area designated by the SUXOS. The Search Team UXOS will estimate and record the weight of scrap for each grid.

4.3.7.5 A final inspection of the scrap will be made by the SUXOS and the QCO, after which the SUXOS will sign a certificate stating that "The property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature." All material will be accounted for in the daily and weekly reports.

4.3.7.6 All UXO related scrap will be inspected and vented if necessary. Arrangements will be made with a local scrap dealer to remove the scrap at no cost to the government. A DD Form 1348 will be used to document and account for all scrap turned in.

4.3.8 TRANSPORTATION OF DEMOLITION MATERIALS

4.3.8.1 All movement of demolition explosives will be performed by either the SUXOS or a UXOS.

4.3.8.2 Because all material must be hand carried, explosives will be carried into the site only as required. When explosives are required they will be brought to the detonation point by the SUXOS and the SSO. All HE will be separated and stored in temporary containers until needed. All unused explosives will be removed from the site at the end of each work day and turned over to the Piedmont Explosives delivery person.

4.3.8.3 All demolition explosives and UXO will be inventoried and accounted for prior to performing any demolition operation.

4.3.8.4 Explosives will be transported only on the designated routes.

4.3.8.5 Blasting caps and demolition materials are placed in suitable, separate metal containers, separated and sand bagged, to ensure containment in case of premature functioning of blasting caps. The containers will remain closed at all times, except when actually using the materials.

4.3.8.6 It will be necessary to hand carry demolition materials for long distances along trails.

Due care must be exercised to prevent slips, trips, and falls. All demolition materials will be carried in padded knapsacks, haversacks or packs. NONEL detonators will be separated from other demolition materials during human or animal transport.

4.3.8.7 All demolition materials will be located a minimum of 50 feet from work parties and break areas, but within sight at all times.

4.3.9 DELIVERY OF EXPLOSIVE AND DEMOLITION MATERIALS

4.3.9.1 Due to extreme difficulty encountered in the proper grounding of the explosive storage magazines, no explosives will be stored by HFA for use at this site. Required demolition materials will be delivered to the site on a daily basis by Piedmont Explosives of Romney, WV.

4.3.9.2 The SUXOS or SSO will place the order for the next days demolition materials not later than 13:00 hours the previous day.

4.3.9.3 The driver of the delivery vehicle will deliver the demolition materials to the vicinity of the Bell Knob tower and standby. The delivery vehicle will be parked at least 50 feet from the site trailer, the generator and the flammable storage area at all times.

4.3.9.4 The driver of the delivery vehicle will then wait for further instructions.

4.3.9.5 The SUXOS or UXOS will have the driver deliver the demolition materials to the appropriate trail head.

4.3.9.6 The requested demolition materials will be transferred to HFA custody at the trail head.

4.3.9.7 The SUXOS or UXOS will reconcile the quantity of demolition materials actually used with the Piedmont Explosives delivery person.

4.3.9.8 The delivery vehicle will depart the site.

4.3.10 DEMOLITION OPERATIONS

4.3.10.1 Demolition safety and operations will be conducted in accordance with the standard practices and procedures outlined in TM 60A 1-1-31 and the appropriate specific 60 Series EOD Publications. UXO will only be detonated after positive identification. NONEL procedures will be employed as the method of choice for all detonations. The Restricted Area for demolition operations will be observed (See para 1.4 in SSHP). When ordnance is consolidated within a grid for destruction the Restricted Area will be increased. UXO larger than 81mm will not be consolidated for destruction.

4.3.10.2 Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an

event—such as inclement weather —prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS is responsible for determining whether or not minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify the US Forest Service representative in charge of the time and location of the UXO(s) to be destroyed. HFA personnel will assist by providing perimeter security if necessary.

4.3.10.3 Preparation Sequence

4.3.10.3.1 The process outlined below will be used to assemble a NONEL firing system.

4.3.10.3.1.1 Test and maintain control of the NONEL firing device.

4.3.10.3.1.2 Lay out the NONEL shock cord.

4.3.10.3.1.3 Protect the NONEL detonator.

4.3.10.3.1.4 Prime the charge/s.

4.3.10.3.1.5 Connect the firing device to the shock tube.

4.3.10.3.2 Testing and Maintaining Control of the NONEL firing device

4.3.10.3.2.1 The NONEL firing device will be tested each day as specified in the manufacturer's instructions.

4.3.10.3.2.2 The SUXOS is responsible to maintain control of the NONEL firing device at all times. This responsibility cannot be delegated.

4.3.10.3.3 Laying out the NONEL shock tube

4.3.10.3.3.1 After locating a safe firing area, the NONEL shock tube will be completely laid out. Care will be taken to prevent kinks or sharp bends in the shock tube.

4.3.10.3.3.2 Personnel will not walk on or step over the shock tube.

4.3.10.3.4 Protect the NONEL detonator

4.3.10.3.4.1 The NONEL detonator will be protected at all times prior to priming of the charge/s. Sand bags or cushioning material will be used for this purpose.

4.3.10.3.5 Priming the charges / Returning to the firing point

4.3.10.3.5.1 HFA will use jet perforators and commercially available high explosive boosters to detonate UXO. HFA UXO Specialists are experienced and knowledgeable in the use of these charges and have used them successfully during previous projects.

4.3.10.3.5.2 The NONEL detonator will be connected to a detonating cord trunk line or ring main system.

4.3.10.3.5.3 All personnel involved in the setup of the charge/s will return to the firing point.

4.3.10.3.6 Initiating the NONEL firing system

4.3.10.3.6.1 Control of the firing position will be maintained from this point on. This control will ensure that no-one tampers with the shock tube or fires the charge prematurely.

4.3.10.3.6.2 At this point the ignition system is complete. The NONEL firing device will not be connected until all personnel are accounted for and perimeter security is verified. The SUXOS or designated UXOS for that day's demolition activities, will give the order to fire the charge/s only after verification of perimeter security and all personnel are accounted for. A long blast on the air horn will precede the firing of the charge/s.

4.3.10.4 Detonating UXO in Place

4.3.10.4.1 Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1600 hours. All detonations will be conducted in accordance with 60A1-1-31.

4.3.10.4.2 Detonations will take place only after all unnecessary personnel have left the area and road guards have been posted.

4.3.10.4.3 The composition of the Demolition Team will be determined by the SUXOS. The team will only be composed of qualified UXO personnel under the direct supervision of a UXOS who is the designated blaster. Additional Demolition Teams may be used at the discretion of the SUXOS if there are large quantities of UXO to detonate.

4.3.10.4.4 The remaining HFA UXO personnel may act as perimeter security as directed by the SUXOS.

4.3.10.4.5 Notification of detonations will be made in accordance with the Standard Operating Procedures for Notification of UXO Detonations [*see Appendix F*].

4.3.10.4.6 During detonations, a designated project vehicle will remain as close to the safe area as is possible, to provide emergency support for the demolition team.

4.3.10.4.7 Only the Demolition Team, SUXOS, QC, SSO, and the CEHNC Safety Specialist will be permitted in the area where charges are being assembled and demolition operations are being conducted. However, all of the above authorized personnel should not be in the demolitions operations area at the same time.

4.3.10.4.8 All demolition materials will be accounted for by the UXOS and reported to the SUXOS. Only the amount required to complete the day's operations will be drawn from the Piedmont Explosives delivery person.

4.3.10.4.9 The area where demolition operations are being conducted will remain secured until the "all clear" is given by the SUXOS or SSO.

4.3.10.4.10 After each detonation, the detonation points will be inspected by the UXOS and the SUXOS or SSO to ensure that a misfire, low order, or a kick out has not occurred. The all clear will be sounded by two long blasts of an air horn.

4.3.10.4.11 All charges will be initiated with NONEL. Detonating cord trunk and branch lines will be used to link multiple shots.

4.3.10.5 Misfire Procedures

4.3.10.5.1 In accordance with 29 CFR 1910-109 (e), (4), vi; EM 385-1-1 §29; and 60A 1-1-31, if a misfire occurs, the following general procedures will be strictly adhered to.

4.3.10.5.1.1 The SUXOS will be notified of the time of the suspected misfire; and

4.3.10.5.1.2 The SUXOS will notify the HFA Project Manager (PM), if on site, and the CEHNC Safety Specialist. All other personnel will be notified of the event via radio, or by three short blasts of an air horn, all persons are instructed to hold their positions until the "all clear" is given. The circumstances surrounding the misfire will be included in the sites Daily Journal [*see Appendix G HFA Forms*].

4.3.10.5.2 NONEL misfire Procedures (shock tube failed to function)

4.3.10.5.2.1 Another attempt will be made to fire the shot. If a secondary firing system is available for use it may be employed.

4.3.10.5.2.2 The NONEL firing device will be checked and reloaded with a new primer.

4.3.10.5.2.3 The shock tube will be re-attached to the firing device. Another attempt will be made to fire the charge/s.

4.3.10.5.2.4 Thirty minutes will lapse prior to the downrange inspection of a NONEL misfire. The entire system will be checked for breaks . If it is suspected that the NONEL system is at fault, no attempt will be made to remove or handle the NONEL detonator. A new charge will be assembled and placed next to the misfired charge and detonated.

4.3.10.5.3 Detonating Cord Misfires

4.3.10.5.3.1 A new NONEL detonating system will be attached to the remaining detonating

cord, with care taken to fasten it properly, and the original charge will be detonated.

4.3.10.5.3.2 Branch lines will be treated in the same manner as noted above.

4.3.10.5.3.3 If detonating cord leading to the charge detonates but fails to function the charge, the following actions will be taken:

4.3.10.5.3.3.1 Investigation will not occur until 30 minutes after the charges have stopped burning.

4.3.10.5.3.3.2 The charge will be re-primed and another attempt will be made to detonate the charge.

4.3.10.5.3.3.3 Scattered charges that do not contain blasting caps or detonators may be collected and detonated together.

4.4 NOTIFICATION

4.4.1 Notification will take place as outlined in the Standard Operating Procedures for Notification of UXO Operations [*see Appendix F*].

CHAPTER 5
TECHNICAL & MANAGEMENT PLAN

5.1 APPROACH, METHODS, AND OPERATIONAL PROCEDURES

5.1.1 All UXO removal actions and operations will be performed in accordance with this WP, the SOW [*see Appendix A*], the SSHP [*see Appendix B*], and CEHNC's Safety Concepts & Basic Considerations for UXOs [*see Appendix D*].

5.1.2 UXO detection, identification, and disposal will be in accordance with Chapter 4 of this Work Plan.

5.1.3 A systematic search of all areas identified in the SOW will be performed by laying out a grid network and documenting the search, location, QC, and QA of each grid.

5.1.4 The subsurface removal grids/areas will be investigated using ferrous magnetic locators. UXO Teams will then excavate and determine the identity of each subsurface anomaly. All UXO will be detonated in place. All other UXO scrap and UXO related material determined to be free of explosive residue will be vented if required and turned over to the DRMO at Letterkenny Army Depot, PA. or to a local commercial scrap dealer, at no charge to the government.

5.1.5 All UXO located in each grid will be plotted and recorded by the UXOS. Each day's data will be inspected by the QC officer, processed in the site's data base and then plotted on the sites digital map. Daily reports will be generated from the data base by the QC Officer and provided to the SUXOS.

5.1.6 A weekly meeting will be held, at which the following weeks work schedule will be reviewed and discussed with the Forest Service Representative. Locations of work will be discussed in detail and visited if necessary. Planned or necessary trail or area closures will be planned and published.

5.2 MOBILIZATION, DEMOBILIZATION AND HOME LEAVE

5.2.1 **MOBILIZATION**: The work site at Dolly Sods is isolated rental and leased equipment must come from distant sources. Therefore, HFA anticipates an early mobilization of the SUXOS, SSO, QC, and one UXO Team. This team will:

5.2.1.1 setup the site:
5.2.1.2 receive and prepare equipment
5.2.1.3 arrange for the delivery of explosives to the site.
5.2.1.4 liaison with emergency support agencies
5.2.1.5 test communications

5.2.2 HOME LEAVE: A home leave will be scheduled for Labor Day weekend. An additional home leave will be scheduled for the week of Thanksgiving, which coincides with the opening of deer hunting season in the project area. All of the potential lodging facilities are pre-booked and a break at this time is also recommended by the EECA and the Forest Service Representative as a safety measure.

5.2.3 DEMOBILIZATION: Demobilization can take place upon completion of the project, when the weather becomes adverse and hampers site operations, or at the opening of deer hunting season. Re-mobilization will take place in the spring, possibly the week of 20 April 1998. Adverse weather can be expected at any time during the project.

5.3 DESCRIPTION OF ORDNANCE LOCATORS TO BE USED

5.3.1 HFA will use Schonstedt Flux Gate Magnetometers. These magnetometers have been furnished by the government.

5.3.2 Schonstedt Magnetometers are ferrous metal locators and will only detect "iron" or magnetic materials. The depth of detection is limited by the size and orientation of the target and the soil characteristics of the work area. The instrument is not capable of classifying the anomaly; it will only indicate the presence or absence of a magnetic anomaly. The target must be excavated and investigated by a trained UXO Specialist.

5.3.3 Schonstedt Magnetometers do not require calibration. They have a simple battery function test and a "GO"/"No Go" field operational check. This check is achieved by burying a target of a similar size and characteristics as the expected type of UXO. Magnetometer(s) will be tested before starting UXO operations in the morning and when operations are resumed after lunch. Random checks will be performed by the QC Officer and or the SUXOS during daily operations to ensure the equipment is operating and being operated properly. Failure to detect the test target is reason to reject the instrument and return it to the manufacturer for repairs.

5.3.4 During subsurface magnetometer searches, the magnetometers will be set on the sensitivity setting that provides for positive detection of the test target.

5.4 COMPOSITION AND MANAGEMENT OF TEAMS

5.4.1 Project Headquarters Element

5.4.1.1 The Project Headquarters is composed of the PM, SUXOS, SSO, QC Officer, and a clerk. This element is responsible for the command, control, and coordination of the resources of the project.

5.4.1.2 The communications trailer will be located at the Bell Knob Tower. This location has a locked gate controlling access. Communications and GPS antennae will be temporarily installed at this location. The area has no utilities and a generator will be required to provide power. A guard will be stationed at the communications trailer at all times.

5.4.1.3 UXO Search Teams

5.4.1.3.1 A maximum of five UXO search teams will be used to perform UXO removal operations. Site layout and gridding will be conducted as required. Each team will be composed of one UXOS and four or more, but no more than six, UXO Specialists. Each team will be under the direct supervision of the UXOS. All field operations will be under the overall supervision of the SUXOS.

5.4.1.2.2 Search teams will be responsible for:

5.4.1.2.2.1 -Establishing and laying out the search lanes;

5.4.1.2.2.2 -Operating magnetometers and metal detectors;

5.4.1.2.2.3. -Marking, plotting, and recording all UXO/UXO related materials located during grid searches;

5.4.1.2.2.4 -Identifying and classifying UXO and UXO components;

5.4.1.2.2.5 -Conducting explosive disposal procedures of UXO;

5.4.1.2.2.6 -Segregating and removing all OE scrap from each grid.

5.5 METHOD OF TRANSPORTING UXO TO THE SAFE HOLDING AREA

5.5.1 There will be no designated Safe Holding Areas. All UXO unsafe to move will be detonated in place. If a UXO is safe to move, it may be considered for consolidation within the grid for destruction in order to conserve explosives and setup time.

5.6 PROTECTIVE MEASURES TO BE EMPLOYED

5.6.1 Several methods of protecting people and structures may be employed during the course of this Removal Action.

5.6.1.1 An appropriate safety distance will be maintained during intrusive activities, disposal operations and only UXO qualified persons will be authorized within this area while intrusive activities are underway.

5.6.1.2 There may be inhabited buildings/structures located at the head of some trails. Generally this area is uninhabited, but trails where UXO operation are ongoing will be blocked and posted, guards will be posted during demolition operations.

5.6.1.3 In the case of planned detonations, item(s) that are near trail heads and to be detonated will be earth tamped as required. But in order to preclude unnecessary cratering effects and to reduce the amount additional labor, items that are detonated within the remote areas and beyond

the fragmentation range of trail heads or structures will not be tamped. The area will be evacuated and secured to the maximum fragmentation distance for any UXO that is to be detonated (*See Paragraph 1.4, SSHP*).

5.7 Layout of the Grid System

5.7.1 The boundary of the area was determined by the ASR and CEHNC. GPS will be used to tie the grid network to the West Virginia State Plane, and plot trails as well as mark campsite's and other significant points. The location of grids will be digitally plotted on the area map provided by CEHNC.

5.7.2 The nominal size of each grid will be 100' x 200'. Many areas will not permit this configuration however, and the grid will be modified to fit the area of concern.

5.7.3 Where possible, grids and sweep lanes will be laid out in a north - south direction, sweep lanes will be five feet in width. Grids will be identified by an alpha-numeric code (*i.e.*, Grid 1-A1 will be the first grid in Site 1 and all other grids will be numbered sequentially).

5.7.4 UXO and other significant points will be plotted on an HFA UXO Grid Location Form [see Appendix E] by the UXOS, IAW para 7.3, using an XYZ coordinate system measuring from the southwest corner of each grid. All Y coordinates will be referenced from the south grid boundary measured to the north, and all X coordinates will be from the western grid boundary measured to the east. The Z coordinate will be the depth at which the UXO was located.

5.7.5 Each UXOS will submit all of his completed grid forms to the QC officer at the end of each working day. The QC officer will review each grid form for completeness and accuracy. After review, the information on all forms will be entered into the site's data base and digital maps.

5.8 GANTT CHART OF PROJECT

5.8.1 A Gantt chart depicting project schedules and milestones is provided at Figure 5-1.

5.9 ESTIMATED COST FOR THE SCHEDULED WORK

5.9.1 A spread sheet depicting the anticipated expenditures for the duration of this task is provided at Figure 5-2.

5.10 REQUIRED REPORTS

5.10.1 The following reports will be provided by the SUXOS to the HFA PM via the Monday following the end of the work week/month.

5.10.1.1 Weekly Project Summary [*see Appendix G*]

5.10.1.2 Weekly QC/Safety Report [*see Appendix G*]

5.10.1.3 Weekly QC Report [*see Appendix G*]

5.10.1.4 The HFA Waldorf, Maryland office will prepare and provide to the CEHNC PM the following reports.

5.10.1.4.1 A Monthly Summary will be provided of operations and events for the project site.

5.10.1.4.2 Progress/Meeting Reports will be submitted within 10 days of the event.

5.10.1.4.3 A draft Final Removal Report will be provided within 30 days of project completion.

5.10.1.4.4 A revised Final Removal Report within 30 days after receipt of CEHNC comments.

FIGURE 5-1
GANTT CHART

Task Name	Start Date	Effort	End Date
Site Visit	8/11/97	5.00d	8/15/97
Draft Work Plan	9/15/97	5.00d	9/19/97
Corps Review	9/22/97	5.00d	9/26/97
Final Work Plan	9/29/97	1.00d	9/30/97
NTP	10/1/97	1.00d	10/1/97
Site Preperation	10/2/97	4.00d	10/7/97
OE Removal	10/7/97	51.00d	11/20/97
Site Shutdown	11/21/97	100.00d	4/15/98
Re-mobilize	4/20/98	72.00d	7/30/98
Draft Final Report	8/1/98	30.00d	8/30/98
Corps Review	9/1/98	30.00d	9/30/98
Final Report	10/1/98	30.00d	10/30/98

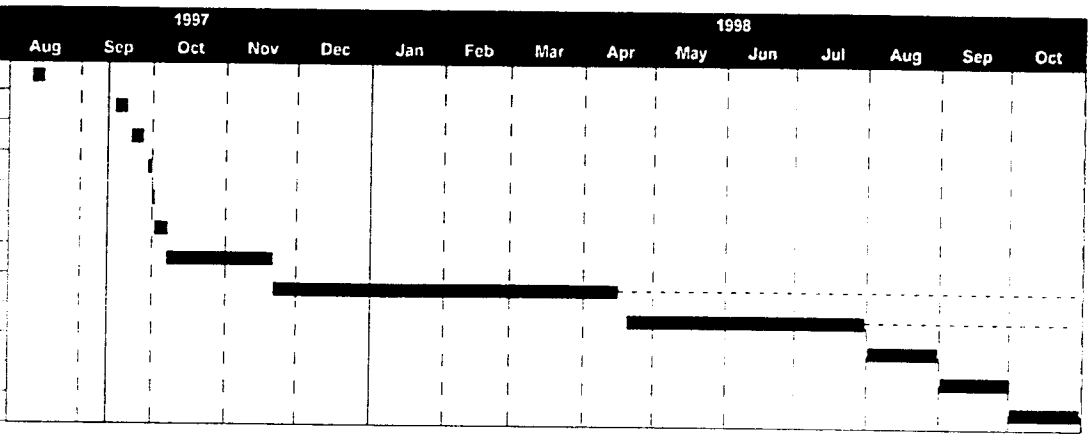


FIGURE 5-2
ESTIMATED COST OF THE PROJECT

FIGURE 5-2			
ESTIMATED COST OF THE PROJECT			
		Estimated	
		Hours	Estimated
Description	**Unit Cost**		**Labor Cost**
Project Manager	$48.91	578	$28,269.98
Sr. UXO Supervisor	$40.42	662	$26,758.04
Site Safety Officer	$37.71	613	$23,116.23
Quality Control Officer	$38.75	525	$20,343.75
UXO Supervisor	$34.61	2545	$88,082.45
UXO Specialist	$30.34	9890	$300,062.60
Admin Support	$16.61	600	$9,966.00
Laborer	$13.45	2400	$32,280.00
TOTAL LABOR		**14813**	
		Total Labor	**$528,879.05**
			Estimated
Materials	**Cost/Wk**		**Material Cost**
Vans (5)	$1,050.00		$15,750.00
Jeep Sta. Wag. or Similar (2)	$420.00		$7,140.00
Pickup, (3)	$630.00		$10,710.00
Fuel	$350.00		$5,950.00
Telephone Service	$100.00		$1,700.00
Telephones (2 cell)	$200.00		$3,400.00
On Site Explosive Delivery	$900.00		$13,50[illegible]00
Radio Rental	$250.00		$4,000.00
Magnetometer Repair	$110.00		$1,650.00
Surveyor	$5,000.00		$5,000.00
Admin Supplies	$100.00		$1,500.00
Field supplies	$500.00		$7,500.00
Office Rental	$350.00		$5,950.00
Trailer Rental	$50.00		$850.00
Misc	$5,000.00		$5,000.00
Printing			$2,000.00
			$101,218.00
	Unit		Estimated
Travel and Per Diem	**Cost**		**Travel Cost**
Travel	$650.00		$37,700.00
Per Diem	$30.00		$83,520.00
Lodging	$50.00		$139,200.00
			$287,764.10
			$917,861.15

CHAPTER 6
WORK, DATA, & COST MANAGEMENT PLAN

6.1 MANAGEMENT

6.1.1 This project will be managed by an HFA PM. The PM will be on site during the initial phases of the project and will be located at HFA's Waldorf, Maryland office when not on site. In either case, the PM will track the progress of project using computerized project management software and spreadsheets. The PM will receive daily and weekly reports from the SUXOS detailing the utilization of project funds, man-hours, and equipment, as well as other pertinent data concerning site accomplishments. The PM will also make periodic site visits to personally view and inspect the site records and work progress, and he will always be available by phone (301)705-5044 to assist the SUXOS or the customer as the need arises.

6.1.2 The actual conduct of the work is outlined in this WP. HFA has a supervisory staff of experienced professionals to manage all phases of the project. Each PM is versed in the use of Lotus 1,2,3, a spread sheet designed to manage numerical data. Lotus 123 provides actual cost vs. planned cost data comparisons and graphic displays enabling the PM to accurately track costs and work completion goals, as well as allocate resources.

6.1.3 HFA's estimate of the projected costs for this project are shown in Figure 5-2.

6.2 SCHEDULE OF PROJECT MILESTONES

Perform Site Visit	Completed August 15,1996
Submit Disposal Alternatives Letter	Completed August 16,1996
Submit Draft Work Plan	Completed September 13, 1996
Receive Comments	November, 4, 1996
Submit Final Work Plan	Completed December 5, 1996
Perform Site Preparation	Completed May 12, 1997
Receive NTP	Completed May, 1997
Start OE Clearance	June 4, 1997
Home Leave	Labor Day Weekend, 1997
Site Shutdown for Winter	November 20, 1997
Re-mobilize Site	April 20, 1998
Start OE Clearance	April 27, 1998
Complete OE Clearance	July 30,1998
Submit Draft Final Report	August 31, 1998
Receive Comments	September 30, 1998
Submit Final Report	October 31, 1998

STAFFING/RESUMES [see Appendix H, HFA Resumes]

6.2.1 PROJECT MANAGER (PM)

6.2.1.1 Mr. Floyd A. Kittle is responsible for the effective day-to-day management of the project staff; direct communication and liaison with the client; technical approach and review of deliverables; management of resources, schedules, and budgets; and coordination among the general and technical support functions.

6.2.2 SENIOR UXO SUPERVISOR (SUXOS)

6.2.2.1 Mr. Donald Smith is responsible for the day-to-day on-site management of UXO services. His responsibilities include coordination and direction of all UXO site operations.

6.2.3 SITE SAFETY OFFICER (SSO)

6.2.3.1 The Site Safety Officer has the responsibility for ensuring site safety and compliance with the safety provisions of the WP and SSHP. The SSO has the on-site responsibility and authority to modify and/or halt work, and to remove personnel from the site if working conditions which may affect on-site/off site safety and health change. The site SSO is the main contact for any on-site emergency. Except in an emergency, the SSO may modify the approved SSHP only after consultation and concurrence of the HFA PM and the Contracting Officer.

6.2.4 QUALITY CONTROL OFFICER (QC)

6.2.4.1 The Quality Control Officer is responsible for quality control of all site activities administered by HFA and required by CEHNC. He will be responsible to the PM for project quality control, which includes administering the program and coordinating directly with the SUXOS. He is also responsible for maintaining the site inventory of all government and HFA company equipment.

6.2.5 UXO SUPERVISOR

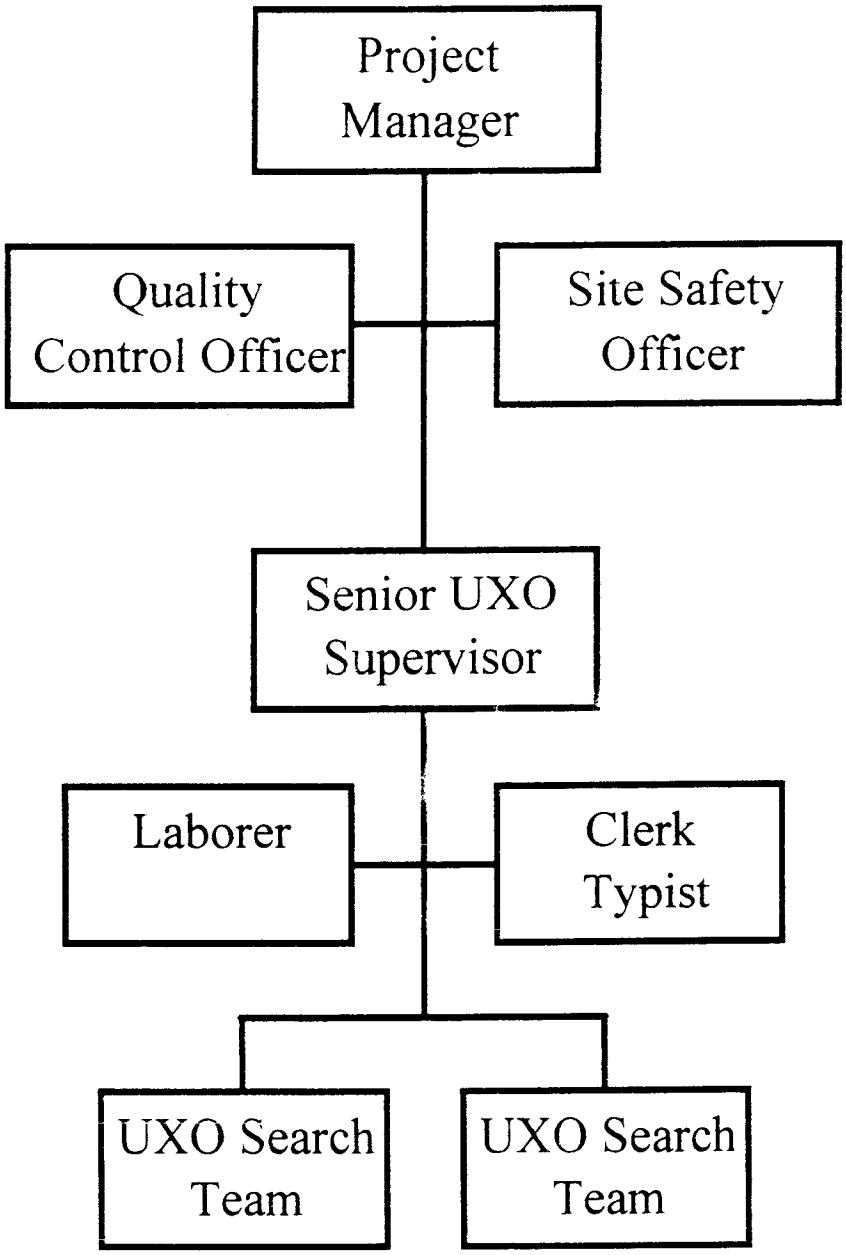
6.2.5.1 Each UXO Supervisor is responsible for his team's operations; ensuring personnel compliance with safety and PPE requirements; monitoring working conditions and notification of the SSO, QC or SUXOS of any unsafe condition; and identifying Ordnance, Ammunition, & Explosives or UXO that are located within his team's operating zone. He also has the authority to stop operations in his zone if any unsafe act or condition exists until corrective action is taken.

6.3 PERSONNEL REQUIREMENTS

1 - Project Manager
1 - Senior UXO Supervisor
1 - Site Safety Officer
1 - Quality Control Officer
1 - Admin Clerk
1 - Laborer
5 - UXO Supervisors

20 - UXO Specialists

FIGURE 6-1



ORGANIZATION CHART

CHAPTER 7
SURVEYING AND RECORDING

7.1 SURVEYING

7.1.1 The following information is excerpted from the SOW and provided here should there be a requirement as part of the clearance activity to establish additional survey control in and around Dolly Sods Wilderness or North Dolly Sods areas. HFA has been supplied a copy of the existing monument locations, survey control markers and digital mapping files previously established (under a separate delivery order) in the Dolly Sods Wilderness, Cabin Mountain, and Black Bird Knob areas. HFA will follow the guidance provided by the following paragraphs and plot all grid locations using GPS.

7.1.2 The corners of all of the areas that are cleared of UXO shall be plotted on a reproducible (Mylar) planimetric or topographic map (at a scale no smaller than 1 inch = 200 feet) to show their location with respect to all the surface and planimetric features within the project area. In addition, all UXO that are located in the field shall be plotted and shown on the map in their respective locations.

7.1.3 Items and data to be submitted to CEHNC as follows:

7.1.3.1 Drawings. All maps shall be drawn at a scale no smaller than 1 inch = 200 feet on reproducible (Mylar) drawings. One original copy and one blue line print of each final drawing shall be delivered to CEHNC. Maps will include true North Arrow and Magnetic North Arrow. Coordinates will be referenced to the State Plane.

7.1.3.2 Northings and Eastings. A tabulated list of the northings and eastings of all grids and camp sites will be submitted.

7.1.4 Schedule. All work and services under this paragraph shall be completed and submitted to CEHNC IAW with paragraph 4.1 of this SOW.

7.2 GPS TEAM RESPONSIBILITIES

7.2.1 The team will be equipped with the necessary materials for laying out search grids within their assigned work areas. The GPS team may be equipped with a GPS receiver or Total Station for general mapping and plotting of camp site boundaries, trails, wetlands, etc. During all field and intrusive activities the GPS team shall be equipped with a magnetometer.

7.2.2 The team will be responsible for:

7.2.2.1 locating and establishing grids;

7.2.2.2 marking and identifying each grid;

7.2.2.3 coordinating, and processing data.

7.2.3 The team will also serve to support additional requirements, such as a licensed land surveyor if required.

7.3 MARKING SIGNIFICANT ANOMALIES/POINTS

7.3.1 Each grid will be investigated using a Schonstedt Magnetometer. All UXO in each grid will be plotted and recorded by the UXOS as outlined in paragraph 7.1 above. Each day's data will be processed and included in the site's data base.

7.3.2 UXO and other significant points will be plotted on an HFA UXO Grid Location Form [*see Appendix E*] by the UXOS using an XYZ coordinate system. All measurements will be from the southwest corner of each grid. All Y coordinates will be referenced from the south grid boundary measured to the north and all X coordinates will be from the western grid boundary measured to the east. The Z coordinate will be the depth at which the UXO was located. The depth of UXO located in areas designated for surface only clearance will not be recorded because all UXO will be on the surface.

7.3.3 Each UXOS will submit all of his completed grid forms to the QC at the end of each working day. The QC will review each grid form for completeness and accuracy, after which the information in all sheets will be entered into the site's data base.

7.3.4 Significant anomalies/points are defined as:

7.3.4.1 any complete live UXO, such as a mortar round, artillery shell, or bomb, etc.;

7.3.4.2 all buried pits or trenches regardless of what they contain;

7.3.4.3 excavations where historical artifacts are discovered; and

7.3.4.4 the points where in-place detonations occurred.

7.3.5 Scrap will be recorded only as a total quantity by weight for each grid, small arms ammunition will likewise be recorded as total quantity per grid. Neither scrap or small arms locations will be plotted.

7.3.6 DAILY RECORDING REQUIREMENTS

7.3.6.1 Each UXOS will provide to the QC a detailed accounting of all ordnance, ammunition, and explosive item/component/scrap encountered. This accounting will include the quantity, type, depth, condition, and final disposition of all items located in each grid.

7.4 LOGS, RECORDS AND REPORTING [*see Appendix G, HFA Forms*]

7.4.1 The SUXOS will keep the official log. He shall record UXO positions and significant anomalies. This log will be an official part of the site operation's record. The log will be kept separate and in addition to the Daily Site Journal. This log shall be maintained as a spreadsheet or data base, and will be provided as part of the information and data for the final report.

7.4.2 The UXOS will maintain a 'rough log' providing the SUXOS with the details required for the official record. The rough log will be maintained in the same fashion as the official log and may become part of the Daily Site Journal and HFA Grid Location Forms.

CHAPTER 8
ENVIRONMENTAL PLAN

8.1 OVERVIEW

8.1.1 GENERAL DESCRIPTION OF THE AREA

8.1.1.1 This removal project consists of searching all Forest Service designated trails, 20 feet to each side of the trails, all Forest Service inventoried campsites (cleared areas only), a total of 98.9 acres of open land, five acres of wooded land off Rocky Point Trail, three cabin sites and a dump site. OE shall be cleared to a depth of 1 foot in trails and adjacent areas and open and wooded land and to 4 feet in campsites, cabin sites and the dump site. To minimize adverse impacts on the environment, HFA will follow the mitigation measures defined in field operating procedures provided by the Forest Service and the Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment dated September 1995 and the Environmental Assessment pertaining to North Dolly Sods. These mitigation measures include the following:

- Motorized vehicles will not be used off established roads.

- Before activities begin within the area, Government-furnished specialists will train the Contractor's personnel to recognize endangered species, historic and prehistoric sites, and protect habitat.

- Prior to beginning their work, the Forest Service will provide the Contractor with maps showing the locations of known cultural resource sites, statements as to the significance of those sites, and recommendations for treatment. These maps will be reviewed by all Contractor personnel.

- If artifacts or structural remains are detected in a work area, they will be carefully set aside, then returned to their previous locations.

-If artifacts or structural remains are detected in a designated work area not known to be a site, that location will be noted on a map along with a general description of what was found. This information will be furnished to the Forest Service.

- When areas not previously designated as work areas are selected for disturbance, the Forest Archaeologist will be notified and given the opportunity to survey for cultural resources in that area.

8.1.1.2 Operational Instructions for protection of the Cheat Mountain Salamander (CMS) in unexploded ordnance removal activities at Dolly Sods Wilderness in 1996: The following operational instructions shall replace CMS protection measures as listed on page 4-9 of the approved environmental assessment, in the biological evaluation and in the 22 August 1995 consultation letter from the U.S. Fish and Wildlife Service to Colonel Jemiola.

8.1.1.3 When a metal object is detected by a magnetometer and the object is beneath a trail or beneath the area within 20 feet of each side of the trail the anomaly will be hand excavated to a depth of one foot.

8.1.1.3.1 The ordnance specialist will remove, as much as possible, by hand, any leaf litter and organic matter from an area large enough to dig a hole to the maximum depth allowed (1 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in a plastic bag or bucket for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in a suitable container with damp moss and the container will be kept cool, and placed in the shade. It may be necessary to utilize a cooler. Only one salamander will be placed in each container.

8.1.1.3.2 The ordnance specialist will then hand excavate down to the metal object to identify it, or to the maximum depth allowed.

8.1.1.3.3 If the metal object is not a UXO, the metal object will be removed from the hole and the hole rechecked to insure that the metal object is not masking a UXO. After the hole is judged to be clean as well as QC'd and QA'd satisfactorily, the non UXO material will be replaced (metal objects associated with ordnance may be removed); and the soil tamped with the foot, leaf litter and organic matter replaced.

8.1.1.3.4 Release any salamanders previously collected to the area.

8.1.1.4 If the metal object is a UXO, but can be safely moved, such as an unfuzed UXO. The UXO will be excavated and considered for consolidation with other UXO in the grid for detonation, or be detonated in place. The excavation will be backfilled, tamped and the leaf litter and organic matter replaced. Release any salamanders previously collected.

8.1.1.5 If the metal object is a UXO that must be detonated in place, mark the location, a qualified Forest Service representative will direct the search for and collect all salamanders from within 15 ft. of the UXO.

8.1.1.6 If any salamanders are found, remove the majority of leaf litter and organic matter from a 15 foot radius area around the UXO and store in plastic bags or buckets out of detonation range. Consult the Forest Service Representative to determine if this is required if no salamanders are found.

8.1.1.7 All salamanders collected will be placed in suitable containers (a breathable plastic bag) with damp moss and kept cool in the shade. This may require the use of a cooler. Only one salamander will be placed in each container. Multiple salamanders may be placed in container such as a cooler as long as each salamander is self contained within the cooler.

8.1.1.8 If a UXO is detonated directly beneath the trail, backfill the crater with rocks from the detonation point plus additional rocks from within 100 feet to complete filling the crater.

8.1.1.8.1 To minimize the effects of collecting rocks and material to refill the crater, remove small quantities from several different areas within the designated area. Cover rocks placed in the crater with any clumps of soil from the detonation and tamp the soil.

8.1.1.8.2 Replace leaf litter and organic matter uniformly across the site from where it was collected, and replace any salamanders collected.

8.1.1.8.3 If a UXO is not detonated in the trail , the crater may not need to be refilled unless required by the Forest Service.

8.1.2 If the metal object is detected beneath a designated camping area the object will be excavated to a depth of four feet. Deeper excavations will be approved by the CEHNC Site Safety Specialist and the Forest Service Representative.

8.1.2.1 The UXO Specialist will conduct searches and excavations in the same manner as described above. He will apply the same techniques to protect the CMT's and their habitat.

8.1.2.2 In order to protect salamanders and their habitat, personnel will conduct a search for and collect all salamanders from within a 15 foot radius of a UXO that is to be detonated. The Forest Service Representative will be consulted for guidance in these areas.

8.1.3 If the metal object is located on the surface of the ground in camp sites, or within the search areas along trails:

8.1.3.1 If the metal object is not a UXO or UXO Related. The object will be lifted and the area beneath it will be checked. If the area is clean, the item will be replaced where it was found.

8.1.3.2 If the object is an unfuzed UXO, it may be considered for consolidation with other UXO in the grid for detonation or it will be detonated in place.

8.1.3.3 If the metal object is a UXO that cannot be moved, it will be detonated in place. In order to protect salamanders and their habitat, personnel will conduct a search for and collect all salamanders from within a 40 foot radius of a UXO that is to be detonated. The Forest Service Representative will be consulted for guidance in these areas.

8.1.4 There will be no need for a biologist to conduct a walkover of the area to identify potential CMS habitat before the project begins. Under these operational instructions, all sites where metal objects are found and excavated to be identified and/or detonated will be treated to protect the CMS and other salamander species and vertebrate animals.

8.1.5 If there is a need to use sandbags as a protective measure when detonating any UXO, a borrow area will be jointly selected by the ordnance specialist and a qualified Forest Service person, as an area from which soil may be taken to fill sand bags. These borrow areas will be treated similar to a site where a metal object is found. Leaf litter and organic matter will be removed and stored, salamanders collected, borrow material removed, litter replaced and

salamanders replaced.

8.1.6 It will not be necessary to conduct field surveys for CMS at night or within 48 hours of rainfall.

8.1.7 Other animals such as turtles, toads, lizards, snakes, etc., found while searching for salamanders or while removing leaf litter shall be relocated to adjacent areas.

8.1.8 Since trails and campsites are heavily impacted by human use, it is unlikely that large amounts of leaf litter or salamanders will need to be removed from these areas prior to excavation of a metal object or detonating a UXO.

8.2 SITE CONDITION SURVEY

8.2.1 The HFA PM will perform a site condition survey prior to commencing UXO operations. During this survey, the project site areas, access routes, and adjacent areas will be visually examined to note utilities, site improvements, fences, trees, shrubs and other features. The conditions of these items will be noted and included on a hand drawn sketch of the site during the survey of the site. Specific items of interest are as follows.

8.2.2 TREES

8.2.2.1 The physical condition of trees, to include existing damage, will be noted.

8.2.3 VEGETATED AREAS

8.2.3.1 The physical condition of shrubs and vegetated areas, to include existing damage, will be noted. As noted during the Site Visit, the actual project site is *an environmentally sensitive* area and as such is largely pristine. HFA's activities do not normally disrupt the vegetation or wildlife because excavations are small and the soil is normally replaced immediately after the contact is removed. In all cases HFA personnel will seek the advice and counsel of the Forest Service Representative on matters of replanting or reseeding.

8.2.4 ON-SITE AND IMMEDIATE OFF-SITE DRAINAGE

8.2.4.1 Existing drainage patterns will be noted, especially areas undergoing active erosion/sedimentation. HFA personnel will make every attempt not to change existing drain patterns.

8.2.5 ACCESS ROADS AND HAUL ROUTES

8.2.5.1 The access roads and haul routes will be examined for signs of deterioration and wear, such as potholes, muddy stretches, obstructing debris, and clogged drainage ditches.

8.2.6 DRAIN CULVERTS

8.2.6.1 Drain culverts will be checked for crushed sections and blocked openings, and their location will be noted.

8.2.7 FENCING

8.2.7.1 Damaged or missing sections of fencing will be noted.

8.2.8 PRE-EXISTING REFUSE/DEBRIS ACCUMULATIONS

8.2.8.1 The location of accumulated refuse or other debris within or adjacent to the project site will be noted.

8.2.8.2 A copy of the site condition survey will be provided to the Contracting Officer (CO) or the designated Contracting Officer's Representative (COR).

8.3 ENVIRONMENTAL PROTECTION

8.3.1 All land areas on-site and outside of the specifically assigned UXO work areas, storage areas, and access routes will be preserved in their original condition during the course of UXO operations. UXO work activities will be confined to the areas defined in the WP. Trucks and equipment will be confined to the designated haul and access routes and the project work area. During site UXO operations, every effort will be made to prevent damage to the roads, culverts, trees, shrubs, and grassed areas.

8.3.2 PROTECTION OF LANDSCAPING

8.3.2.1 All landscaping outside of the specifically assigned UXO work area shall be preserved in its original condition with the following restrictions observed:

8.3.2.1.1 No trees, shrubs, turf, or crops will be removed, cut, or disturbed.

8.3.2.1.2 All public and private easements used for site access will be restored to the original condition.

8.3.2.1.3 No ropes, cables, or guys will be fastened to any nearby trees for anchorage. Trees will not be painted or marked with spray paint. If it becomes necessary to mark an area, spray chalk or flagging tape will be used.

8.3.2.1.4 If it becomes necessary to erect barrier cable for site security, waste segregation, or equipment staging areas, posts will be placed on anchorages.

8.3.2.1.5 Appropriate measures will be taken during excavation of UXO to prevent root damage to trees that are to remain alive. If the situation arises where a UXO is located beneath or

entangled in the roots of trees or bushes the Forest Service Representative will be advised and consulted for the disposition of the UXO.

8.3.2.1.6 During excavation of suspected UXO sites, the boundaries will be marked to ensure that all UXO operations are restricted to the limits of the project area.

8.3.2.1.7 Collection of the UXO scrap and non-hazardous UXO components will be consolidated in predetermined holding areas awaiting turn-in to DRMO or **local scrap dealer at no cost to the Government.**

8.3.3 PROTECTION OF WATER RESOURCES

8.3.3.1 As a rule, all UXO services are limited to surface searches and hand excavation of suspected UXO. Little to no waste is generated by these services that could result in contaminated waste entering surface waters. The individual UXO excavations performed by HFA usually involve a total surface area of only two to four square feet. Each hole is immediately filled in after excavation and tamped. Due to the minimal intrusive soil activities, run-on/run-off control measures as outlined in EM 385-1-1 are not required.

8.4 CONTAMINATION CONTROL MEASURES

8.4.1 This plan focuses on the minimization of contaminant generation resulting from UXO operations in the Dolly Sods Wilderness. There are two primary areas in which contaminant generation could occur. They are (1) airborne contaminants or potentially toxic vapors, and (2) liquid spills. Previous site investigations do not indicate the presence of, nor do we expect to encounter, Hazardous Toxic or Radiological Waste (HTRW). Therefore, this plan does not provide for the removal or remediation of HTRW. If HTRW is encountered, HFA's personnel will secure the site, withdraw to a safe area, and report the suspected HTRW to the CEHNC Safety Representative and the Forest Service Representative.

8.4.2 WASTE DISPOSAL

8.4.2.1 HFA will maintain appropriate project on-site housekeeping practices during the course of the UXO services project. All waste generated by HFA will be collected and properly disposed of.

8.4.3 DUST CONTROL

8.4.3.1 HFA's UXO services will not normally generate any significant amounts of dust that require dust control measures.

8.4.4 SPILL CONTROL

8.4.4.1 To minimize the possibility of spilling any potentially hazardous unknown liquid, HFA personnel will not open, move, or otherwise handle any drums or containers. To control possible

spills of liquids such as gasoline or other petroleum used in the course of the work day. HFA will store such materials in suitable approved containers and when dispensing them personnel will do so on a leak proof surface such as a plastic or metal lined tray whenever possible. If spills do occur when refueling equipment, they will be immediately cleaned up and the materials contained. Because no motorized equipment will be used in the area, the use of fuel or other similar materials will be restricted to use at the Bell Knob Tower communications site. If a spill resulting from a ruptured UXO or some other type of container filled with chemical agents or HTRW should occur, HFA and all other personnel on-site shall evacuate in an upwind direction.

8.5 POST-UXO OPERATIONS CLEANUP

8.5.1 HFA will maintain a clean and unobstructed working environment at all times. No tools, equipment, materials (except as noted below), or rubbish will remain on-site following completion of UXO operations. With the exception of the boundary markers used to identify the limits of the UXO services performed by HFA, all rubbish and other materials brought onto the project site by HFA will be removed at the conclusion of the days activities.

8.5.2 SITE WALKOVER

8.5.2.1 The HFA PM or SUXOS will perform a site walkover inspection to ensure that all of the UXO excavations have been filled and tamped. The PM will also ensure that all of the rubbish and materials brought on-site by HFA have been collected and properly disposed of.

CHAPTER 9
QUALITY CONTROL

9.1 To ensure that effective UXO services are performed, the quality control procedures outlined below will be in effect during this project.

9.2 EQUIPMENT

9.2.1 All equipment will be inspected by the SUXOS and/or the QC Officer prior to placing it in service to ensure it meets the required standards. Equipment received in unsatisfactory condition will be returned for replacement or repair.

9.2.2 EMERGENCY EQUIPMENT

9.2.2.1 All emergency equipment or emergency items will be inspected daily, or as required by the manufacturer, to ensure that they are operating as designed and are in good repair.

9.2.3 MAGNETOMETERS

9.2.3.1 Magnetometers will be field tested daily to ensure they are operating properly. This will be accomplished by planting a 75mm projectile, or equivalent, at a depth of *three feet as required* by the Statement of Work. If a magnetometer does not meet the standard during the daily check, it will be returned to the manufacture for calibration, repair or replacement.

9.2.4 HAND TOOLS

9.2.4.1 UXO tools and demolition kits will be inspected prior to use, or at least weekly, to ensure that they are complete and in good repair.

9.2.5 SITE SPECIFIC ITEMS

9.2.5.1 Individual sites may require items that are not normally included in the site inventory. These items could include PPE or special tools. All site specific items will be inspected to ensure that they are in good repair.

9.2.6 OPERATIONAL CHECKS

9.2.6.1 Magnetometer(s) will be tested before starting UXO operations in the morning and when operations are resumed after lunch. Random checks will be performed by the QC Officer and/or the SUXOS during daily operations to ensure the equipment is operating and being operated properly.

9.3 RECORDS AND RECORD KEEPING

9.3.1 The QC Officer will inspect all records to ensure they are kept and maintained in the manner prescribed by HFA Standard Operating Procedures. Records will include, but are not limited to, UXO/demolition explosives inventories, safety reports, and training and maintenance records.

9.3.2 The QC Officer will conduct a timely review of all UXO Grid Location Forms to ensure completeness and accuracy prior to the data being transferred to the map database.

9.4 QUALITY CONTROL SITE CHECKS

9.4.1 Quality control site checks will be performed of the areas and grids completed. The QC Officer will perform a visual inspection of each grid site to ensure that all excavations and the area has been restored as nearly possible to its original condition.

9.4.1.1 Magnetometer sweeps will be performed over 10% of each grid in areas where a sub surface removal was performed. If a UXO is located in any grid, it will cause the entire grid to be re swept to insure it is free of UXO/anomalies.

9.4.1.2 Points or areas where Non UXO metallic material was located and returned to their locations will be marked and identified to facilitate QC/QA checks. Excavations will not be refilled until the excavations have been checked by the CEHNC Site Safety Specialist.

9.4.1.3 Grid markers will not be removed until the grids have received a satisfactory QA check by the CEHNC Site Safety Specialist and the Forest Service.

9.4.2 In addition to 10% QC grid inspections, the QCO will conduct random observations of UXO teams' search and clearance operations. These field observations will ensure proper operational techniques and methodologies are being used.

9.4.3 The HFA QCO will provide to the CEHNC Safety/QA Specialist by the close of business each day, a list of all grids that have been QC'ed and are ready for QA inspection. If no grids were QC'ed that day, no report will be required.

9.5 DAILY QUALITY CONTROL REPORTS

9.5.1 Daily Quality Control Reports [see Appendix G, HFA Forms] will be completed and submitted to the PM. These reports will include descriptions of the areas quality control checked and the results of the check. The results of his records inspections will be submitted at the end of this project.

CHAPTER 10
COMMUNICATIONS

10.1 HANDHELD RADIOS

10.1.1 A base station radio will be located in the communications trailer in the vicinity of Bell Knob Tower. Hand held radios will be used to maintain communications between the site and all field units. All personnel will be familiar with radio operation and communication procedures. Radio checks will be made prior to departure from the office site and from each teams work site in order to establish positive communications. Periodic check-ins with the base station are required.

10.1.2 Since HFA will be working in an unfamiliar site, it will be necessary to conduct a complete communications survey of the wilderness area using radios. "Dead spots", if any, located during the survey will be noted and plotted on a communications map. If it becomes necessary to work in a "dead spot", the SUXOS will station a "radio relay" person in such a position as to be able to communicate with both the work site and the base station.

10.2 TELEPHONES

10.2.1 Normal commercial telephone service is not available at the work site. Cellular telephone communications will be available from the communications site to all emergency agencies. In addition, a land line telephone is available in the West Virginia Department of Natural Resources cabin located in Laneville. This telephone is to be used only in case of emergency.

CHAPTER 11
PROPERTY MANAGEMENT PLAN

11.1 This section prescribes HFA's procedures for managing HFA property, HFA procured government property, and government furnished property.

11.2 GENERAL

11.2.1 HFA's goal is to ensure that our personnel have the correct, workable equipment to efficiently accomplish the job assignment, while purchasing/leasing this equipment to provide the best combination of price and value to the client. To maximize the use of resources, it is imperative that we know what equipment is on-hand, its location, and its working condition.

11.3 RESPONSIBILITIES

11.3.1 It is HFA's responsibility to provide the necessary equipment to its workforce to accomplish the assigned task in a safe and cost effective manner. HFA must and will maintain proper accountability of all government furnished and HFA procured government property as specified in the contract.

11.3.2 SUPERVISOR RESPONSIBILITY

11.3.2.1 It is the responsibility of the UXOS to ensure that property issued to or used by his team is properly used and cared for, and that proper custody and safe keeping are provided. This is an inherent responsibility and is not contingent upon whether or not there is a signed receipt.

11.3.3 DIRECT RESPONSIBILITY

11.3.3.1 It is the obligation of each person to ensure that all property for which he or she is issued is properly used and maintained, and that proper custody and safe keeping are provided.

11.3.4 PERSONAL RESPONSIBILITY

11.3.4.1 It is the responsibility of all HFA personnel to exercise reasonable and prudent action to properly use, care for, and safeguard property in their physical possession, whether or not they are receipted for it.

11.4 PROPERTY CATEGORIES

11.4.1 For the purposes of this contract, HFA will divide property into the following accountability categories:

11.4.1.1 Vehicles - trucks, 4 WD vehicles, ATV's etc., leased from a local vendor or government furnished.

11.4.1.2 Heavy Equipment - backhoes, bulldozers, etc., leased from a local vendor.

11.4.1.3 HFA Property - equipment owned by HFA and leased to the client at a competitive rate, such as GPS equipment, computers, magnetometers, mobile phones, etc.

11.4.1.4 Non-Expendable Government Property (both GFE and HFA procured)

11.4.1.5 Field Equipment - property and equipment that is not expended by its intended use, such as magnetometers, audio visual equipment, surveying equipment, etc., that is primarily used by field crews.

11.4.1.6 Office Equipment - property and equipment that is not expended by its intended use, such as computers, office furniture, copiers, etc., that is primarily used in the site office.

11.4.1.7 Expendable Government Property (both GFE and HFA procured) - items that are consumed during their use and lose identity, such as office supplies, tyvek, gloves, marking paint, surveyors stakes, rain gear, etc.

11.5 ACCOUNTABILITY

11.5.1 It is the responsibility of the person in charge of each HFA office/project site to designate a specific individual as property manager to maintain supply/equipment logs and files and to conduct periodic physical accounting/reconciliation of all property.

11.5.2 It is imperative that control of all equipment be established upon receipt. Arriving items will be verified against shipping documents and, once completed, these items will be placed on a Government Tracking Log (GTL) [see Appendix G, HFA Forms].

11.5.3 All blocks of the GTL will be completed. Two copies of the GTL, as well as shipping documents, will be maintained. A completed copy of these documents will be provided to the CEHNC Property Manager upon request and upon completion of the project.

11.5.4 When inventorying the equipment, shipping documents will be used as proof of receipt.

11.5.5 All Non-expendable and expendable property will be maintained on the same GTL with the appropriate box checked to indicate its category.

11.6 MARKING OF EQUIPMENT

11.6.1 Initial non-expendable equipment received from the CEHNC Property Manager will have an identifying number on the paperwork (i.e., Portable Radio with Charger CEHNC-SO-110). That number will also be affixed to the item of equipment. All other equipment not requiring a number will be marked "CEHNC."

11.6.2 When a non-expendable item is purchased, such as a typewriter, the CEHNC Property Manager will be contacted and a number obtained for that piece of equipment.

11.7 PETTY CASH LOGS/SPREADSHEET

11.7.1 Petty Cash Logs/spreadsheet [see Appendix F, HFA Forms] are forwarded to the Holicong, PA office at the end of each time period, or bi-weekly. All original receipts are forwarded with this log/spreadsheet. A copy of the log/spreadsheet and receipts will be maintained on site. All property purchased will be entered on the GTL.

11.8 MASTER CARD LOG

11.8.1 A Master Card Log/spreadsheet [see Appendix F, HFA Forms] will be maintained for each individual possessing a company credit card. This log, like the Petty Cash Log /spreadsheet, will be maintained with a separate numbering system. Original receipts will be forwarded to Holicong, PA, on the same schedule as the Petty Cash Log /spreadsheet. Copies of the log and receipts will be maintained on site. All property purchased will be entered on the GTL.

11.9 MAINTENANCE

11.9.1 Regular and scheduled maintenance (if required) will be performed on all government property in accordance with the manufacturer's instructions. All equipment maintenance and calibration will be conducted in accordance with the manufacturer's specifications. Maintenance and calibration logs will be maintained for each item.

11.10 STORAGE

11.10.1 HFA will have storage facilities located in the office building located at the Fort Hill Motel. All equipment other than expendable personal gear (rain suits, etc.) will be stored in this building during non working hours.

11.11 DISPOSITION

11.11.1 In the event that government equipment must be disposed of, turned in for repair, or returned to the government, authorization will be required from the CEHNC Property Manager prior to action being taken. A complete record will be maintained and the circumstances documented in the remarks section of the GTL.

11.11.2 A detailed, written report will be prepared by the PM or SUXOS for all lost, damaged, or destroyed accountable property and immediately forwarded through the project management and supply channels to the Contracting Office. This report will provide a detailed description of what happened, including applicable statements and reports (e.g. Police Reports). Adjustments to the GTL will not be made until the CEHNC Property Manager has completed an investigation and the CO has notified HFA to make the adjustment.

11.11.3 At the close of the project, all government equipment and property will be turned in to the CEHNC Property Manager, shipped to a project site designated by him/her or custody maintained by HFA . Appropriate shipping and chain of custody documents will be prepared as directed by the CEHNC Property Manager, and the shipment will be documented in the "Remarks" section of the GTL. One copy of the annotated GTL is to be sent to the CEHNC Property Manager and one copy is to be retained with the site records for inclusion in the final report.

11.12 As the project progresses, the SUXOS will replace expended consumables and make additional equipment purchases required to support the project up to the amount authorized by the basic contract. If a purchase in excess of this amount is required, three quotes will be obtained and submitted to the Contracting Officer, along with justification for requesting the purchase, for his/her approval. Equipment may be transferred from other project sites as they are completed. The following equipment is to be used in the performance of this Task Order:

11.12.1 VEHICLES

Van Type Vehicles (full size)	5 ea
F-150 Type Pickup Trucks w/Bed Liner	3 ea
Jeep Station Wagon or Similar	2 ea

11.12.2 HFA EQUIPMENT

Sokkia Spectrum GPS System w/Two Rovers Systems and 1 Base Station	1 ea

11.12.3 NON-EXPENDABLE GOVERNMENT FIELD EQUIPMENT

Generator Set, Gasoline, 4-6 KW	1 ea
Schonstedt GA52 CX	24 ea
Cellular Telephones	3 ea
NONEL Firing Devices	2 ea
Portable Stretcher	2 ea
Portable Oxygen Unit	1 ea
VHS Video Camera	1 ea
300' Fiberglass Survey Tapes	5 ea
Hand held Compasses	4 ea
Redi-Rite Sheet Holders	10 ea
5 gal Water Jugs	6 ea
Tool Kits w/Hand Tools	2 ea
Long Handled Shovels	20 ea
Small Crowbars	10 ea
Pick Mattocks	10 ea
Sledgehammer	1
Small picks	10 ea
Blasting Cap Crimpers	3 ea
5 gal OSHA Gas Cans for Generator	2 ea
Rubbermaid Team Boxes	5 ea
Pack, ALICE	A/R

11.12.4 NON-EXPENDABLE OFFICE EQUIPMENT

Desktop Computer, 1 GBHD, Double Speed CD ROM, Fax Modem w/Lotus 123 and Word Perfect for Windows installed	2 ea
Monitor	2 ea
Copier	1 ea
Laser Printer	1 ea
Fax Machine	1 ea
Surge Suppressors	4 ea
3 Hole Punch	1 ea
2 Hole Punch	1 ea
Stapler	2 ea
Tape Dispenser	2 ea

11.12.5 EXPENDABLE GOVERNMENT PROPERTY

Handy Wipes	A/R
36" Wood Survey Stakes	A/R
Red Plastic Survey Flags	500
Yellow Plastic Survey Flags	500
Red Flagging Tape	75 rolls

Vertical Wood Survey Stake Bags	2 ea
Survey Flag Carry Bags	2 ea
1/4" Poly Line	1,000 ft
Electrical Cord Reels	6 ea
Field Books	8 ea
Duct Tape	A/R
Monofilament Tape	A/R
Electrical Tape	A/R
Caution Tape	12 rolls
"AA" or "C" or 9 volt Batteries	A/R
Fluorescent Orange Marking Paint	A/R
White Marking Paint	A/R
EMT First Aid Kit	1 ea
Small First Aid Kits	10 ea
Burn Kits	10 ea
Eyewash Kits	5 ea
10abc Fire Extinguisher	10 ea
20lb abc Fire Extinguisher	2 ea
35mm Film	A/R
VHS HQ Videotape	2 ea
20' x 100' 6 mil Plastic Sheeting	1 roll
5 gal Plastic Buckets	15 ea
Sand Bags	500 ea
Small plastic bags, for Schonstedts	A/R
Plastic Trash Bags	A/R
Leather Work Gloves	A/R
Rain suits	28 ea
Boots, Hiking	A/R
Disposable CPR Masks	A/R
Tick Repellant	A/R
Air horns w/Compressed Air	10 ea
Nitrile Inner Gloves	3 boxes
Earplugs	1 box
Sweep Brooms	A/R
Jet Perforators	120
80 grain Detonating Cord	1,000 feet
NONEL Firing Systems	120
Detonating Cord Clips	50 ea
Copy Paper	A/R
Fax Paper	A/R
Pens, Pencils, Markers, etc.	A/R
Envelopes	A/R
Scissors	2 pr

Yellow Legal Pads	A/R
1/4" Grid Pads	A/R
3 Ring Binders	A/R
Hanging File Folders	A/R
Waste Baskets	2 ea
Trash Barrels	2 ea
Petty Cash Log	1 ea
Staples	A/R
Scotch Tape	A/R
Misc. Clips, Tacks, etc.	A/R
Staple Remover	1 ea
Paper Towels	A/R
Paper Cups	A/R
Electronics Cleaner	A/R

CHAPTER 12
GENERAL SITE REQUIREMENTS

12.1 SAFETY TRAINING

12.1.1 The SUXOS, and SSO are responsible for implementing a rigorous training program covering safe and proper work practices. This will include occupational hazard training and familiarization with emergency procedures. Although no CWM materials are expected on this site, training will include recognition of CWM, signs and symptoms of exposure, emergency procedures, and HFA's role in supporting and assisting TEU should any be discovered. Records will be maintained for training schedules, topics, and safety logs. Training will be conducted in accordance with the provisions of paragraph 4.3.5.1 of the of the Site Specific Safety and Health Plan.

12.1.2 All personnel will attend the initial site safety and indoctrination briefing prior to being assigned any tasks in the field. This briefing is site-specific training conducted on-site and will outline specific procedures to be followed. The course will be broken down into the following areas:

12.1.3 PROJECT SCOPE

12.1.3.1 The project scope instructions will include staff instructions; chain of command; climate; terrain; history of range; project objectives and deadlines; on-site facilities; PPE; and personal, rental, CEHNC, and company equipment.

12.1.4 MEDICAL

12.1.4.1 Medical instructions will include health and physical problems; posted procedures; and medical emergency routes.

12.1.5 EMERGENCY PROCEDURES

12.1.5.1 Emergency instructions will include actions; procedures; and chain of command.

12.1.6 DEFINITION OF WORK SITE

12.1.6.1 Definition of work site instructions will include access/egress and operations.

12.1.7 ENDANGERED SPECIES, HABITAT, AND HISTORICAL SITE TRAINING

12.1.7.1 The West Virginia Department of Natural Resources and the Forest Service professionals will provide initial training of UXO personnel in the identification and handling endangered species, historical artifacts and other issues of concern.

12.1.8 PROJECT COMMUNICATION

12.1.8.1 Communication instructions will include radio familiarization and procedures.

12.1.9 ACCIDENT REPORTING

12.1.9.1 Accidents of any nature will be immediately reported to the UXOS who will report them directly to the SUXOS. Accidents involving personnel injuries will be reported to the PM or SUXOS immediately. Injuries requiring medical treatment or first aid will be reported [see Appendix I, Accident Report Form 3394] and investigated in accordance with AR 385-40 and U.S. Army Corps of Engineers supplements.

12.1.10 UXO PERSONNEL

12.1.10.1 UXO personnel will receive additional training, which will include UXO refresher training, magnetometer operation (all assigned units), range control, and medical evacuation procedures.

12.1.11 SAFETY MEETINGS

12.1.11.1 Safety meetings will be at least daily, and more frequently if conditions warrant, or as required by the UXOS. All safety meetings will be documented on the Site Safety Meeting Attendance Log [see Appendix F, HFA Forms].

12.1.12 NON-UXO PERSONNEL

12.1.12.1 Non-UXO personnel will also receive UXO recognition and safety training prior to beginning work on-site.

12.1.13 UXO SAFETY TRAINING AND OTHER SITE HAZARDS

12.1.13.1 UXO safety and hazards training will be continually reinforced throughout the project and will be a daily topic for each morning's Tailgate Safety Meetings.

12.2 OFFICE FACILITIES

12.2.1 Office facilities will be located in a building behind the Fort Hill Motel.

12.3 VISITOR CONTROL

12.3.1 All visitors are required to report to the PM or SUXOS at the site on each and every visit. Visitors to sites must meet all of the provisions of the SSHP prior to entering or visiting any site. All subcontractor work and/or visitor tours will be closely coordinated with the SUXOS to ensure safety of all personnel, and all UXO work will cease while the visitor is in the area.

12.4 INCLEMENT WEATHER

12.4.1 The SUXOS and the SSO will monitor the weather and determine if it is safe to conduct operations in inclement weather. Lightning storms shall cancel all field operations until the storm passes. In all instances, personnel safety is foremost.

12.5 PERSONNEL SAFETY

12.5.1 At no time will personnel conduct UXO operations on the site unless accompanied by a least one other person. A two-man policy or "buddy system" shall be in effect during operations. The only exception will be when traversing in a vehicle along access roads.

12.6 PHYSICAL QUALIFICATIONS

12.6.1 All persons will be physically, medically, and emotionally qualified for performing the duties to which they are assigned. Some factors to be considered in making work assignments are strength, endurance, agility, coordination, visual and hearing acuity, and the ability to wear and properly maintain any required personal protective equipment. All site employees are enrolled in the HFA Medical Surveillance Program and will be screened and certified by a qualified Occupational Health Physician.

12.7 DRUG/ALCOHOL ABUSE PREVENTION

12.7.1 Substance abuse will not be tolerated. HFA has a comprehensive Drug and Alcohol Abuse Policy and Program. All employees are screened for drugs during initial and annual physical and all employees are required to read and acknowledge receipt of a copy of the HFA Drug and Alcohol Policy. Personnel exhibiting irregular or unusual actions will not be permitted on the work site. Personnel identified as substance abusers will be dismissed.

12.8 PERSONAL PROTECTIVE EQUIPMENT

12.8.1 All personnel will be dressed to protect themselves from job related hazards. Additional protective equipment will be provided as required by the task and the SSHP. All contaminated PPE will be handled and disposed of in accordance with the provisions of 29 CFR 1910.120.

12.9 PROJECT EQUIPMENT

12.9.1 Only licensed drivers will be allowed to drive vehicles owned or leased by HFA. Drivers will obey all traffic laws, whether driving on or off the site. Persons who receive traffic tickets or summonses will be personally responsible for any fines incurred.

12.9.2 Vehicle drivers are responsible for conducting safety inspections prior to operation of the vehicle. Items to be inspected include, but are not limited to, fuel level, tires, belts, trailer hitches, fluid levels, and gauge operation. All vehicles will be equipped with fire extinguisher and first aid kits. All discrepancies will be reported to the SUXOS.

12.9.3 Any special or heavy equipment owned or leased by HFA will only be operated by personnel that have received training on that specific type of equipment. Training will be documented in the individual's personnel folder.

12.10 NON-PERSONNEL ACCIDENTS

12.10.1 Accidents involving damage to equipment or property will be immediately reported to the SUXOS, SSO or the QC . The SUXOS, SSO or QC will conduct an investigation of the accident to attempt to ascertain the facts and, if possible, determine responsibility for the accident. The SUXOS or SSO will institute preventative measures to avoid future occurrences. All accidents which occur on this project will be reported and investigated in accordance with paragraph 01.D of EM 385-1-1.

12.11 FIRE

12.11.1 In the event of a fire, the PM and/or SUXOS will be notified via the radio, and help will be summoned by calling 911 which will provide nearest fire department support.

12.12 SAFETY INSPECTION SCHEDULE

12.12.1 Continuous monitoring of all safety aspects of this contract in accordance with these plans will be carried out by the SSO. Daily worker inspections are the responsibility of the UXOS. The SSO will provide a report of items inspected and results of the inspections.

12.12.2 Corrective action will be taken any time the CEHNC Safety Specialist indicates work is not in accordance with safety requirements.

12.13 ACCIDENT INVESTIGATION/REPORTS

12.13.1 The following procedures will be used to investigate all accidents.

12.13.1.1 A sequence will be established of events leading to the accident.

12.13.1.2 The accident scene and all involved property will be observed. Sketches or photographs will be used, if necessary, to clearly present the sequence of events and possible contributing factors.

12.13.1.3 The cause of the accident or contributing factors will be identified, if possible.

12.13.1.4 Interviews will be conducted of people involved and witnesses. Each witness and those involved will be identified.

12.13.1.5 The accident scene will be photographed as soon as possible.

12.13.1.6 The collected information will be analyzed and a corrective action/plan will be developed to eliminate future accidents, if possible.

12.13.1.7 Copies of the accident report will be provided to the CEHNC Safety Specialist and CEHNC.

12.13.1.8 All accidents which occur incident to the project will be investigated, reported, and analyzed as prescribed in paragraph 01.D of EM 385-1-1.

12.13.1.9 Accidents of any nature will be immediately reported to the PM and/or SUXOS and HFA's Health and Safety Manager.

12.14 FORMS

12.14.1 Appendix G contains examples of some of the forms HFA expects to use during the life of this project. These examples are not necessarily all inclusive, and forms may be added or deleted as required.

12.15 REFERENCES

American National Standards Institute (ANSI Z39.18-1987)

USACE EM 385-1-1 Safety and Health Requirements Manual

U.S. Army Regulation AR 385-40 with USACE Supplement (1987) Accident Reporting and Records

FM 5-250 Explosives and Demolition - TM 60A-1-1-31

HFA Site Operations Safety Manuals

HFA Comprehensive Drug Free Work Place Program

U.S. Army Corps of Engineers, Huntsville Division, Safety Concepts and Basic Considerations of Unexploded Explosive Ordnance (UXO)

Contract DACA87-94-D-0019

STATEMENT OF WORK
ORDNANCE REMOVAL ACTION
FORMER WEST VIRGINIA MANEUVER AREA
DOLLY SODS WILDERNESS
DAVIS, WV

20 JUNE 1997

1.0 BACKGROUND AND GENERAL STATEMENT OF WORK: The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program (DERP) - Formerly Used Defense Sites (FUDS). Ordnance and Explosive (OE) contamination exists as a result of Department of Defense activities.

1.1 OE is a safety hazard and constitutes an imminent and substantial endangerment to the public. During this removal action, it is the Government's intent that the contractor destroy all OE encountered. This action will be performed in accordance with (IAW) the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 104, and the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required.

1.2 This ordnance removal action does not fall under the RCRA hazardous waste management requirements.

1.2.1 The provisions of 29CFR 1910.120 apply.

1.2.2 Due to the inherent risk in this type of operation, the contractor shall be limited to a 40-hour work week: either five 8-hour days or four 10-hour days. UXO personnel shall not perform UXO-related tasks more than 10 hours per day.

1.2.3 All work performed under this contract shall be conducted in full compliance with with U.S. Army Corps of Engineers, Huntsville Center (CEHNC), U.S. Army Corps of Engineers (USACE), Department of the Army (DA) and Department of Defense (DoD) requirements and operational instructions for protection of the Cheat Mountain Salamander during ordnance removal activities at the Dolly Sods site.

1.2.4 This Project does not require an on-site full-time Contract Manager.

1.3 GENERAL DESCRIPTION:

1.3.1 The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness ***and the Dolly Sods North Area***. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training as well as a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and

hunting. It is estimated that between 45,000 and 76,000 people visit Dolly Sods Wilderness ***and the Dolly Sods North Area*** annually.

1.3.2 The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

1.3.3 This SOW pertains to 20.89 miles of trails and 101 campsites commonly used in the Dolly Sods Wilderness as designated by the U.S. Forest Service. The total acreage to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111.9 acres for trails and 2.0 acres for campsites. ***Areas 1 through Area 9 pertains to the Dolly Sods Wilderness Area.***

1.3.3.1 Area 1. 4 campsite, 2.35 miles of trails. Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

1.3.3.2 Area 2. 2 campsites, 1.05 miles of trails. Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

1.3.3.3 Area 3. 1 campsite, 0.44 miles of trails. Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsite; 2.4 acres trails.

1.3.3.4 Area 4. 5 campsites, 1.63 miles of trails. Total area acreage is 767. Maximum clearance acreage: 0.07 acres campsites; 8.9 acres trails.

1.3.3.5 Area 5. 41 campsites, 7.88 miles of trails. Total area acreage is 1,565. Maximum clearance acreage: 0.60 acres campsites; 43 acres trails.

1.3.3.6 Area 6. 21 campsites, 3.34 miles of trails. Total area acreage is 2,156. Maximum clearance acreage: 0.30 acres campsites; 18.2 acres trails.

1.3.3.7 Area 7. 5 campsites, 0.69 miles of trails. Total area acreage is 282. Maximum clearance acreage: 0.07 acre campsites; 3.8 acres trails.

1.3.3.8 Area 8. 15 campsites, 2.50 miles of trails. Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites; 13.6 acres trails.

1.3.3.9 Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.10 acres campsites; 5.5 acres trails.

1.3.3.10. Clear 23 miles of trails and 20 feet on each side, and to the depth of 1 foot. Total area acreage is 114.3.

1.3.3.11 Clear 98.9 acres of open land on Blackbird Knob to the depth of 1 foot.

1.3.3.12 Clear 75 campsites, 3 cabin sites, and 1 trailer dump site to the depth of 4 feet. Total area acreage is 3.1.

1.3.4 Clearing these areas will be a relatively normal UXO clearance operation involving close coordination of the clearance team with the on-site Forest Service representative. No brush and tree clearance will be done on this site.

1.3.5 An unexploded ordnance field investigation was conducted by a Corps of Engineers, Huntsville Division, contractor during July-October 1991. 18 random areas were sampled which composed 281 surface acres and 10 subsurface acres. The site was found to be contaminated with OE and OE-related scrap. The UXOs found included 4.2", 81mm, 60mm, mortars, and 57mm projectiles. It is also reported that 105 and 155mm projectiles have been found and the area was used to test fire rockets.

1.4 **DEFINITIONS:** Definitions of applicable terms are found in Section C, paragraph 2.4, of the basic contract.

2.0 **OBJECTIVE:** The Contractor shall safely locate, recover and dispose of all surface and subsurface ordnance and explosives (OE) to a depth of one foot beneath all trails (to include a width of 20 feet on each side of the trails) and to a depth of four feet beneath designated camping areas at this site.

3.0 DESCRIPTION OF SERVICES:

3.1 **General.** This removal project consists of searching all Forest Service designated trails, 20 feet to each side of the trails, and all Forest Service inventoried campsites (cleared areas only). OE shall be cleared to a depth of 1 foot in trails and adjacent areas and to 4 feet in campsites. To minimize adverse impacts on the environment, the Contractor shall follow all mitigation measures defined in field operating procedures provided by the Forest Service and the *Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment* dated September 1995. These mitigation measures include the following:

- No motorized vehicles will be used in the Wilderness.

- Before activities begin within the Wilderness, Government-furnished specialists will train the Contractor's personnel to recognize historic and prehistoric sites.

- Prior to beginning their work, the Forest Service will provide to the Contractor maps showing the locations of known cultural resource sites, statements as to the significance of those sites, and recommendations for treatment.

- If artifacts or structural remains are detected in a work area, they will be carefully set aside, then returned to their previous locations.

- If artifacts or structural remains are detected in a designated work area not known to be a site, that location will be noted on a map along with a general description of what was found. This information will be furnished to the Forest Service.

- When areas not previously designated as work areas are selected for disturbance, the Forest Archaeologist will be notified and given the opportunity to survey for cultural resources in that area.

3.2 Operational Instructions for protection of the Cheat Mountain Salamandar (CMS) during unexploded ordnance removal activities at Dolly Soda Wilderness in 1996. The following operational instructions shall replace CMS protection measures as listed on page 4-9 of the approved environmental assessment, in the biological evaluation and in the 22 August 1995 consultation letter from the U.S. Fish and Wildlife Service to Colonel Jemiola.

-When a metal object is detected by magnetometer:

A. If the metal object is beneath a trail or beneath the area within 20 feet of each side of the trail (hand excavation only to a depth of one foot).

1. The ordnance specialist will remove, as much as possible, by hand, any leaf litter and organic matter from a area large enough to dig a hole to the maximum depth allowed (1 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in a plastic bag or bucket for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in a suitable container with damp moss and the container will be kept cool, and placed in the shade. It may be necessary to utilize a cooler. Only one salamander will be placed in each container.

2. The ordnance specialist will then hand excavate down to the metal object to identify it, or to the maximum depth allowed.

a. If the metal object is not a UXO:

Replace material from the hole without removing the object, (metal objects associated with ordnance may be removed);

Tamp with foot;

Replace leaf litter and organic matter;

Release any salamanders previously collected to the area.

b. If the metal object is a UXO, but can be safely moved, (such as many UXO without a fuse):

Dig out the UXO and transfer it to a storage area mutually agreed upon by the FSS and COE/contractor for later disposal/detonation;

Replace material from the hole;

Tamp with foot;

Replace leaf litter and organic matter;

Release any salamanders previously collected to the area.

c. If the metal object is a UXO that must be detonated in place:

Mark the location;

Call in a qualified Forest Service salamander person;

This qualified person will search for and collect all salamanders from within 15 ft. of the UXO. All salamanders will be placed in suitable containers with damp moss and kept cool in the shade. This may require the use of a cooler. Only one salamander will be placed in each container;

After salamanders have been removed, (if any are found), remove the majority of leaf litter and organic matter from a 15 foot radius area around the UXO and store in plastic bags or buckets out of detonation range. The FS will determine appropriateness of this step if no salamanders are found;

Detonate UXO in place with appropriate use of sand bags;

If the item detonated was directly beneath the trail, fill crater with any rocks in the vicinity resulting from the detonation of the UXO plus any additional rocks from within 100 feet of the detonation needed to complete filling the crater, as deemed necessary. To minimize the effects of collecting rocks and material to fill the crater, remove small quantities from several different areas within the designated area. Cover rocks placed in the crater with any clumps of soil from the detonation, as appropriate. Tamp with foot;

Replace leaf litter and organic matter uniformly across the site from where it had been collected;

Replace all salamanders collected prior to detonation to as close to their site of original collection as possible.

If the item detonated is not located in the trail itself, the crater may not have to be refilled unless such refilling is mandated by the Forest Service.

B. If the metal object is beneath a designated camping area (hand excavation only to a depth of four feet):

1. The UXO specialist will remove, as much as possible, by hand, all leaf litter and organic matter from a area large enough to dig a hole to the maximum depth allowed (4 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in plastic bags or buckets for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in an appropriate container with damp moss and the container will be kept cool in the shade. This may require use of a cooler. Only one salamander will be placed in each container.

2. a. The digging and removal of UXO/UXO scrap will be the same as prescribed in the trail and adjacent areas.

b. Because ordnance personnel have advised that a detonation at four feet in depth with sandbagswill create a similar sized crater and area of impact as a detonation at one

foot of depth, the qualified FS person will search for and collect all salamanders from within a 15 foot radius of the UXO.

C. If the metal object is on the surface of the ground (no substantial hand excavation needed) and on a trail, within 20 ft. of each side of a trail or within a designated camping area:

a. If the metal object is not a UXO:

Leave the object in place, except that metal objects associated with ordnance may be removed.

b. If the metal object is a UXO, but can be safely moved (such as many UXO without a fuse):

Remove the object and transfer it to a storage area mutually agreed upon by the FS and COE/contractor for later disposal/detonation.

c. If the metal object is a UXO that cannot be moved, the qualified FS person will search for and collect all salamanders from within a 40 ft. radius of the UXO. The majority of leaf litter and organic matter from a 40 ft. radius area around the UXO will be removed and stored in plastic bags or buckets out of detonation range. All other procedures for UXO will apply.

There will be no need for a biologist to conduct a walkover of the area to identify potential CMS habitat before the project begins. Under these operational instructions, all sites where metal objects are found and excavated to be identified and/or detonated will be treated to protect the CMS and other salamander species and vertebrate animals.

If there is a need to use sandbags to facilitate detonation of any UXO in place, a borrow area will be jointly selected by the ordnance specialist and a qualified Forest Service person, as an area from which soil may be taken to fill sand bags. These borrow areas will be treated similar to a site where a metal object is found. Leaf litter and organic matter will be removed and stored, salamanders collected, borrow material removed, litter replaced and salamanders replaced.

It will not be necessary to conduct field surveys for CMS at night or within 48 hours of rainfall.

Other animals such as turtles, toads, lizards, snakes, etc., found while searching for salamanders or while removing leaf litter shall be relocated to adjacent areas.

Since trails and campsites are heavily impacted by human use, it is unlikely that large amounts of leaf litter or salamanders will need to be removed from these areas prior to excavation of a metal object or detonation.

3.1 (TASK 1) PERFORM SITE VISIT AND PREPARE WORK PLAN (WP):

3.1.1 PERFORM SITE VISIT: This task shall be accomplished IAW Section C, paragraph 3.2, of the basic contract. Prior to preparation of the WP, a site visit, not to exceed 5 days including travel time, is authorized. The site visit team shall not exceed two persons, one of

whom shall be a Senior UXO Supervisor. The contractor shall notify the CEHNC Project Manager of the proposed dates for the site visit. The site visit shall include coordination with the appropriate Dolly Sods Wilderness agencies. Additionally, the site visit team will coordinate with the local medical facility and airport. During the site visit, environmental concerns, cultural resources and endangered species in the ordnance removal areas shall be addressed.

3.1.2 PREPARE WORK PLAN: The WP shall outline the contractor's proposed methodology of accomplishing the objective. This shall include site-specific training, UXO-related procedures and practices, equipment, administrative area equipment, demolition materials and their security and accountability system, personal protective equipment, responsibilities and qualifications of personnel, organizational structure to include subcontractor(s) (if applicable), internal and external communications, project site office, project schedule, UXO safety and site-general safety to include snakes, ticks, and other flora and fauna, quality control procedures, on-site and off-site emergency medical arrangements to include transportation, and the completion of ENG Form 3394 in the event of an accident. All UXO-related procedures shall comply with CEHNC Safety Concepts and Basic Considerations for UXO.

3.1.2.1 DISPOSAL ALTERNATIVES: Based on the site visit, the contractor shall describe and recommend the safest and most cost-effective method of treatment and disposal of OE. The contractor shall provide three disposal alternatives IAW Section C, paragraph 3.3, of the basic contract. The method of treatment shall be selected and approved by CEHNC, after which the contractor shall proceed with preparation of the WP.

3.1.2.2 The contractor shall submit a draft WP for review and a final WP for approval IAW paragraph 4.1, this SOW.

3.1.2.3 The WP shall include the following subplans written IAW Data Item Description OT-005 of the Basic Contract:

3.1.2.3.1 UXO Operational Plan.

3.1.2.3.2 Site-specific Safety and Health Plan (SSHP). The contractor shall submit a SSHP IAW 29CFR 1910.120 that contains OE safety standards and procedures.

3.1.2.3.3 Equipment Plan (EP). The contractor shall prepare and submit a detailed EP (as a WP subplan) describing the equipment to be employed to perform all necessary operations.

3.1.2.3.4 Location Survey and Mapping Plan.

3.1.2.3.5 Environmental Protection Plan.

3.1.2.3.6 Quality Control Plan.

3.1.2.3.7 Work, Data, and Cost Management Plan.

3.1.3 In addition to the WP and subplans required above, a brief, concise, separate document, the *Remedial Action Safety Plan (RASP)*, shall be prepared for submission with the WP. The RASP shall contain the following information and may reference chapters of the WP, when applicable.

3.1.3.1 Site location and description.

3.1.3.2 Projected removal action starting date.

3.1.3.3 Suspected items.

3.1.3.4 An assessment of the potential for migration of contamination and a description of the steps taken to halt such migration.

3.1.3.5 Precautions to be taken if toxic chemical agent items are discovered.

3.1.3.6 Name of UXO contractor.

3.1.3.7 An on-site detailed disposal plan.

3.1.3.8 A drawing of the site.

3.1.3.9 Location of the demolition area(s) as a potential explosive site and distances of potential exposed sites.

3.1.3.10 A summary of risk assessment and mitigating features at demolition areas.

3.1.3.11 When it is applicable, the off-site disposal plan will include the following specific information: how the off-site disposal will be accomplished; who will perform the actual off-site disposal; the off-site disposal location; transportation procedures; and the expected results of the disposal action.

3.1.3.12 Identify the basic contract and the delivery order.

3.1.4 Other subplans identified in the basic contract are not required for this delivery order.

3.1.5 The contractor shall notify the CEHNC Project Manager, Mr. Bill Sargent, at (205) 895-1562 at least five calendar days in advance of site visit.

3.2 (TASK 2) PERFORM COMMUNITY RELATIONS

3.2.1 The contractor shall assist in the conduct of a public meeting and media day to inform the

public of the purpose of the project, the procedures to be followed, and the cooperation requested.

3.2.2 All press releases and media appearances shall be coordinated with, and approved by, the PAO, Huntington District (See Paragragh 5.0).

3.3 (TASK 3) LOCATION SURVEYING AND MAPPING. The following information is provided should there be a requirement as part of the clearance activity to establish additional survey control in and around Dolly Sods Wilderness. The contractor will be supplied a copy of the existing aerial photography, orthophotos, monument locations, and survey control markers previously established (under a separate delivery order) in the Dolly Sods Wilderness, Cabin Mountain, and Black Bird Knob areas. The contractor shall, following the guidance provided by the following paragraphs, map all grid locations and UXO removed from the project locations. If multiple UXO are removed from an area, that area may be marked as a grid and the corner of the grid located on the map (not each individual UXO).

3.3.1 Control Points. Plastic or wooden hubs shall be used for all basic control points. Horizontal control (1:10,000) referenced to the North American Datum of 1983 (NAD83), and vertical control (1:5,000) referenced to the North American Vertical Datum of 1988 (NAV88) of "Third Order" or better shall be established for the network required for all monuments.

All coordinates and all elevations are to be shown to the closest one hundredth of a foot (0.01). All the control points recovered and/or established at this site shall be plotted at the appropriate coordinate point on a reproducible (Mylar) planimetric or topographic map at a scale of 1 inch = 200 feet.

These points shall be identified on the map by their name or number, final coordinates, and final adjusted elevations. A tabulated list, and a "Description Card" of all control points used, shall be submitted IAW paragraph 3.3.3 of this SOW. The Description Card shall show a sketch of each monument; its location relative to reference marks, buildings, roads, railroads, towers, etc; a typed description telling how to locate the monument from a known point; the monuments name or number; and, the final adjusted coordinates and elevations. The Description Cards shall be 5 inches by 8 inches with one monument per description per card, or two monuments being described on an 8.5 inch by 11 inch sheet of bond paper.

3.3.2 Mapping. The location, identification, coordinates, and evaluations of all the control points recovered and/or established at the site, and the corners of all of the areas that are cleared of UXO, shall be plotted on a reproducible (Mylar) planimetric or topographic map (at a scale no smaller than 1 inch = 200 feet) to show their location with respect to all the surface and planimetric features within the project area. In addition, all UXO that are located in the field shall be plotted and shown on the map in their respective locations.

3.3.3 Items and data to be submitted to CEHNC as follows:

3.3.3.1 Field Survey. The original copies of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound, clearly marked, and identified.

3.3.3.2 A tabulated list of all control points showing the adjusted coordinates and elevations (to the closest one-hundredth of a foot) established and/or used for this survey.

3.3.3.3 A "Report on Establishment of Survey Mark" (Description Card) on each permanent control monument used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates, the adjusted elevations (to the closest 0.01 foot), a written description for locating the monument, and a sketch showing how to locate the monuments.

3.3.3.4 Drawings. All maps shall be drawn at a scale no smaller than 1 inch = 200 feet on reproducible (Mylar) drawings. One original copy and one blue line print of each final drawing shall be delivered to CEHNC. Grid lines referenced to NAD83, and a true North Arrow and Magnetic North Arrow shall be shown on each map.

3.3.3.5 Schedule. All work and services under this paragraph shall be completed and submitted to CEHNC IAW with paragraph 4.1 of this SOW.

3.3.4 During all field and intrusive activities the survey crew shall be accompanied by an UXO Specialist and magnetometer.

3.4 (TASK 4) PERFORM UNEXPLODED ORDNANCE REMOVAL. This task shall be accomplished IAW Section C, paragraph 3.5, of the basic contract.

3.4.1 The contractor shall furnish all necessary personnel and equipment to perform a surface and subsurface clearance of all OE on the project site to a depth of 1 foot on and along trails and 4 feet in campsites. This action shall include all OE-related scrap. Non OE-related metal scrap will be left.

3.4.2. A planned, systematic approach shall be utilized to search and clear the project site that will result in optimum search effectiveness. The proposed methodology shall be outlined in the WP.

3.4.3 UXO encountered during this project shall be disposed of IAW operational instructions for protection of the Cheat Mountain Salamander (para. 3.2). Manual procedures for armed UXO shall not be utilized unless approved by the on-site CEHNC Safety Specialist, who will have

access to all 60-series publications.

3.4.4 All UXO operations shall comply with the U.S. Army Engineering and Support Center, Huntsville, Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO). Only CEHNC approved UXO personnel shall perform UXO-related tasks.

3.4.5 The contractor shall maintain a detailed accounting of all UXO encountered on the project site. This accounting shall include the amounts of UXO, identification, condition, depth located, disposition, and location/mapping. This accounting shall be a part of the Removal Report.

3.4.5.1 An accountability system shall be used that accounts for all demolition materials expended in the disposal of UXO.

3.4.6 If a scenario is encountered that precludes detonating an UXO in place, an unidentifiable UXO is found, or a suspected toxic chemical munition is found, the on-site CEHNC Safety Specialist will request EOD support.

3.4.7 The contractor shall have a contingency plan in place to provide demolition materials in the event the Government supply is depleted and/or resupply is not timely. This shall be outlined in the WP.

3.4.8 During the subsurface operation the contractor shall use a magnetometer capable of detecting a 75mm projectile to a depth of 3 feet. The contractor shall dig to a depth of one foot on and along trails and four feet in campsites to determine the identity of the magnetic anomaly. The on-site CEHNC Safety Specialist may approve deeper excavation if he determines it necessary.

3.4.8.1 Magnetometers shall be field tested daily to ensure that they are operating properly. This shall be accomplished by planting a inert 75mm projectile or similar inert object to a depth of 3 feet and determining the standard indication. If a magnetometer does not meet the standard during the daily check, it shall be calibrated, repaired, or replaced.

3.4.9 If an excavation is required in the potential habitat of an endangered/protected plant or animal, excavation shall proceed only after approval by the Forest Service representative.

3.4.10 Unless approved by the CEHNC Safety Specialist, all recovered UXO shall be disposed of daily.

3.4.11 All access/excavation/detonation holes shall be backfilled IAW Cheat Mountain Salamander operational instructions.

3.5 (TASK 5) TURN IN OF RECOVERED INERT UXO AND RELATED SCRAP:

3.5.1 The contractor shall furnish all necessary personnel and equipment to turn in all recovered inert UXO-related scrap. The methodology to accomplish this task shall be proposed in the WP.

3.5.2 Inert UXO-related scrap shall be segregated from other types of scrap. Inert ordnance items shall be vented IAW Safety Concepts and Basic Considerations prior to turn in.

3.5.3 The contractor shall complete a DD Form 1348-1 and/or local form required by DRMO. The contractor shall prepare, and the Senior UXO Supervisor shall sign, a certificate as follows:

> "I certify that the property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature."

3.5.4 DRMO turn-in documentation receipts shall be submitted as a component of the Removal Report.

3.6 (TASK 6) PERFORM QUALITY CONTROL:

3.6.1 The contractor shall furnish the necessary personnel and equipment to administer a Quality Control (QC) Program to manage, control, and document contractor and subcontractor activities. The methodology to accomplish this task shall be proposed in the WP. The QC activities shall be documented and included in the Removal Report.

3.6.2 During the Government's periodic QA inspections, if an UXO is located in a grid, that entire grid shall be reswept by the contractor.

3.7 (TASK 7) PREPARE AND SUBMIT REMOVAL REPORT: At the conclusion of all field activities, the contractor shall submit the Removal Report which consists of the following:

3.7.1 All original surveying and mapping data from Task 3.

3.7.2 Detailed accounting of all UXO and UXO-related materials located and destroyed.

3.7.3 A daily journal of all activities associated with this SOW.

3.7.4 A recapitulation of exposure data. This shall include total number of man-hours worked on site, total motor vehicle mileage, total number of personnel flying hours, and number of flights.

3.7.5 QC documentation.

3.7.6 DRMO turn-in documentation.

3.7.7 A minimum of 20 4" X 6" color photographs shall be included in the report depicting

major action items and UXO discoveries. The original Final Report furnished to CEHNC shall include original photographic prints. Photographs contained in draft submissions and copies of final submissions shall be color reproductions. Further, a minimum of 45 minutes of narrated video tape depicting all activities shall be provided in three copies to CEHNC.

3.8 CONTRACTOR QUALIFICATIONS: The contractor shall furnish a staff that is qualified through education, training, and experience that shall accomplish the objective and tasks of this SOW. Federal military and civilian employees shall not be employed by the contractor in the performance of any work under the contract (eg: during off-duty hours, regular hours, or while on annual or terminal leave). Resumes for UXO and other personnel, which document the following qualifications, shall be included in the WP for approval. If UXO personnel are substituted at the project site, their resumes shall be approved by CEHNC representatives prior to their admittance onto the site.

3.8.1 Training and medical screening IAW 29CFR 1910.120(e) is required for this project.

4.0 SUBMITTALS: The contractor shall furnish copies of the plans, maps, and reports as identified in paragraph 4.1 to each addressee listed below in the quantities indicated. The contractor shall use express mail services for delivering these plans and reports. Following each submission, comments generated as a result of their review shall be incorporated.

ADDRESSEE	COPIES
US Army Engineering and Support Center, Huntsville ATTN: CEHNC-PM-OT (Mr. Bill Sargent) PO BOX 1600 Huntsville, Alabama 35807-4301	10
US Army Engineer District, Huntington ATTN: CEORH-DL-M (Mr. Richard Meadows) 502 8th St Huntington, WV 25701-2070	2
USDA Forest Service Potomac Ranger District ATTN: (N. Feakes) HC 59, Box 240 Petersburg, WV 26847	3
Mr. B. Durham Supervisors Office, Monongahela National Forest 200 Sycamore St. Elkins, WV 26241	3

Commander, 1
542th Ordnance Detachment (EODCT)
Fort Dix, NJ 08640-5000

4.1 Submittals and Due Dates:

SUBMITTAL	DUE DATES
Disposal Feasibility Letter	5 calendar days after site visit
Draft Work Plan	18 calendar days after site visit
Final Work Plan	48 calendar days after site visit
Draft Removal Report	30 calendar days aftercompletion of field work
Final Removal Report	30 calendar days after receiving review comments

5.0 PUBLIC AFFAIRS: The contractor shall not make available or publicly disclose any data generated or reviewed under this contract or any subcontract unless specifically authorized by the Contracting Officer and the Huntington District Public Affairs Office (PAO). When approached by any person or entity requesting information about the subject of this contract, the contractor shall defer to the PAO for response. Reports and data generated under this contract shall become the property of the Government and distribution to any other source by the contractor is prohibited unless authorized by the Contracting Officer.

6.0 REFERENCES:

6.1 DOD Manual 4160.21.M, Defense Utilization and Disposal Manual.

6.2 AR 200-1, Environmental Protection and Enhancement.

6.3 AR 385-40 with USACE Supplement.

6.4 EM 385-1-1, USACE Safety and Health Requirements Manual.

6.5 TM 9-1300-206, Ammunition and Explosive Standards.

6.6 CEHNC Safety Concepts and Basic Considerations for UXO.

7.0 GOVERNMENT FURNISHED.

7.1 UXO technical publications/information (CEHNC).

7.2 Available equipment (CEHNC)

7.3 Mapping and GIS Data as described in Task 3 (CEHNC).

SURVEILLANCE PLAN
CONTRACT DACA87-94-D-0019
(Attachment)

TASK ORDER NO. 20

CONTRACTOR: HFA, Inc.

PERSONNEL:

Project Manager:	David Shafii
Contracting Officer:	Mary Dowling
Contract Specialist:	Patricia Newman
COR:	Margaret Wilson
Safety Specialist:	Robert Bohannon/Jerry Thornton
Property Manager:	Charles Bell
Technical Manager:	Kevin Healy
Geographic LCPM:	Richard Meadows

SPECIFIC SURVEILLANCE RESPONSIBILITIES:

a. Provide technical guidance to the contractor when necessary or requested.

b. Maintain files for accountability of materials and equipment delivered to the Contractor and by the Contractor to the Government.

c. Monitor Contractor's daily activity as relates to use of personnel and the probability of meeting milestones.

d. Review and make recommendations to the Contracting Officer for payment action, all vouchers, claims, request for adjustment to contract costs and other associated payment matters. Maintain a file on these actions.

e. Report any problems or discrepancies to the Contracting Officer at the earliest time.

f. Prepare and submit a periodic report to the Contracting Officer on the status and progression of the Task Order.

An HNC Safety Specialist will monitor contractor activities for adherence to work safety regulations and guidelines. The Safety Specialist will also assist the COR in monitoring Quality Control at the site. COR will be required to have Corps construction experience, and will also act as the Corps' primary POC for all public involvement activities within and near the project area. If the COR is a trained EOD Safety Specialist, the COR may also be asked to function as the permanent (or temporary) Corps Safety Specialist.

SURVEILLANCE PLAN
CONTRACT DACA87-94-D-0019
ORDNANCE AND EXPLOSIVE WASTE REMEDIATION ACTIVITIES AT FORMERLY USED DEFENSE SITES, ACTIVE DOD INSTALLATIONS, DEFENSE SITES IDENTIFIED UNDER BRAC, PROPERTY ADJOURNING DOD INSTALLATIONS, AND ON OTHER FEDERAL GOVERNMENT OWNED/CONTROLLED SITES IN THE CONTINENTAL UNITED STATES, ALASKA, AND HAWAII

24 June 1997

1. Purpose of the Surveillance Plan

The purpose of this Plan is to establish procedures and responsibilities for the technical, management, and financial oversight of individual Indefinite Delivery task orders generated under this OE removal action contract.

2. Purpose of the Contract

The purpose of this contract is for the Contractor to safely locate, identify, and dispose of Ordnance and Explosive Waste (OE) at various Formerly Used Defense Sites (FUDS), and on active Department of Defense (DoD) Installations. Defense Sites identified under the Base Realignment and Closure Act (BRAC), property adjourning DOD installations, and other federally controlled/owned sites which have been impacted by DOD operations. The facilities are current or formerly used military installations used for storage, evaluation, and disposal of OE materials for military training. OE is a safety hazard and constitutes an imminent and substantial endangerment to site personnel and the local populace.

3. Quality Control Plan

The Contractor is required under 52.246-6, Inspection--Time-And-Material And Labor-Hour clause of the Contract, to provide and maintain an inspection system acceptable to the Government covering the material, fabricating methods, work, and services under this Contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and for as long afterwards as the Contract requires.

4. Unannounced/Announced Audits And Site Visits

CEHNC will schedule unannounced and announced audits and inspection visits to the Contractor's work site, in accordance with HNDM 1110-1-13, paragraph 6-9 and appendices E and F. This action will be initiated by the Project Manager.

5. Payment Estimate/Invoice Reviews

All vouchers are reviewed and approved by DCAA prior to receipt at the paying office at CEHNC. The Contract Specialist will be required to review each spreadsheet created from vouchers received for tracking costs, which includes the amounts charged on the invoice, cumulative amount charged to date, and the amount available under the Task Order. The Project Manager further reviews the vouchers to verify completion, delivery and satisfaction, and to determine that the costs are allowable, allocable and reasonable.

6. Technical Reviews of Contract Modifications

Prior to any contract/task order Scope Of Work (SOW) change being made, the Project Manager is required to perform a technical review of the change to ensure technical validity of the change.

7. Independent Government Estimate (IGE) for Contract Modifications

The Cost Engineer will prepare Independent Government Estimates (IGE) for each contract modification, with input as required from the Project Manager and Technical Manager.

8. Government Furnished Property

If Government Furnished Property (GFP) is provided to the Contractor, accounting and tracking will be in accordance with 52.245-5, Government Property (Cost-Reimbursement, Time-And-Material, or Labor-hour Contracts). The Project Manager is to ensure that the Property Manager is notified of accountable property purchased under the Task Order.

9. Site Safety Plan

A Site-Specific Safety and Health Plan (SSHP) shall be prepared and submitted for review and acceptance by the Government prior to the commencement of any on-site activity. Enforcement will be the responsibility of the Project Manager/COR with assistance as required from the CEHNC Safety Office.

Human Factors Applications, Inc.
ORDNANCE & EXPLOSIVE WASTE REMEDIATION
4950 Route 202, Building 1 Suite 2A, Holicong, PA 18928-0615

ORDNANCE REMOVAL ACTION

FORMER WEST VIRGINIA MANEUVER AREA, DOLLY SODS, WEST VIRGINIA SITE-SPECIFIC SAFETY & HEALTH PLAN

CONTRACT NUMBER:	DACA87-95-D-0027
DELIVERY ORDER:	#0019
CLIENT NAME:	U.S. Army Corps of Engineers
PRIME CONTRACTOR:	Human Factors Applications, Inc.
PROJECT TITLE:	Ordnance Removal Action
PROJECT LOCATION:	Former West Virginia Maneuver Area, Elkins, WV

Date Prepared: 9/17/97

Prepared By: Michael L. Winningham, Safety Manager

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

AGA	American Gas Association
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASME	American Society of Mechanical Engineers
ASR	Archives Search Report
BZ	Breathing Zone
CEHNC	U.S. Army Engineering & Support Center, Huntsville
CERCLA	Comprehensive Environment Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	Cardiopulmonary Resuscitation
CRC	Contamination Reduction Corridor
CRZ	Contamination Reduction Zone
CWM	Chemical Warfare Material
DERP-FUDS	Defense Environmental Restoration Program-Formerly Used Defense Sites
DRMO	Defense Reutilization Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EEDS	Electrical Explosive Devices
EMM	Earth-Moving Machinery
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ESS	Explosive safety Submission
EZ	Exclusion Zone
F	Fahrenheit
GFCI	Ground Fault Circuit Interrupters
HAF	Hazard Analysis Form
HBV	Hepatitis B Vaccinations
HE	High Explosives
HEAT	High Explosive Anti-Tank
HFA	Human Factors Applications, Inc.
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In accordance with
IDLH	Immediately Dangerous to Life or Health
MSDS	Material Safety Data Sheets
mm	Millimeter
NA	Not Applicable
NAD	North America Datum
NCP	National Contingency Plan
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health

OE	Ordnance and Explosive
OOU	Ordnance Operable Units
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PM	Project Manager
PZ	Piezoelectric
SHM	Safety and Health Manager
SUXOS	Senior UXO Supervisor
QC	Quality Control
QCO	Quality Control Officer
RASP	Remedial Action Safety Plan
RCRA	Resource Conservation and Recover Act
RFI	RCRA Facility Investigation
SOP	Standing Operating Procedures
SSO	Site Safety Officer
SSHPs	Specific Safety and Health Plans
SWMUs	Solid Waste Management Units
TCRA	Time-Critical Removal Action
TERC	Total Environmental Restoration Contract
TEU	Technical Escort Unit
TO	Task Order
SZ	Support Zone
TWA	Time-Weighed Average
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCG	United States Coast Guard
UST	Underground Storage Tank
UXO	Unexploded Ordnance
WWII	World War II

REVIEWS AND APPROVALS

_____ _____

Project Manager
HFA, Inc.

Date

_____ _____

Health and Safety Manager
HFA, Inc.

Date

_____ _____

Corporate CIH Director

Date

SITE HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT

I have read, understand, and agree to abide by the provisions as detailed in this Site Specific Safety and Health Plan prepared by HFA, Inc. Failure to comply with these provisions may lead to disciplinary action and/or my dismissal from the work site.

Printed Name	Signature	Date

CHAPTER 1
SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.1 INTRODUCTION

1.1.1 OBJECTIVE

1.1.1.1 This Site Specific Safety and Health Plan (SSHP) has been prepared in conformance with U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1, Occupational Safety and Health Administration (OSHA) Title 29 Code of Federal Regulations (CFR) 1910.120 - Hazardous Waste Site Operations and Emergency Response, 29 CFR 1910.134 - Respiratory Protection, and USACE ER 385-1-92 - Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive (OE) Activities.

1.1.1.2 This SSHP establishes the work practices, health, safety, accident, and fire protection standards and procedures necessary to help ensure protection of HFA personnel and subcontractors during the removal of OE and OE-related scrap from the Former West Virginia Maneuver Area (Dolly Sods North Area), near the city of Elkins, West Virginia. All on-site personnel will read the SSHP and sign the acknowledgement form prior to starting any tasks on the site. The levels of personal protective equipment (PPE) and other controls specified in this SSHP are based on the best available information from references documents, site characterization data, and current site conditions. The SSHP is a living document and may be modified as site conditions change. Any changes in site conditions or changes in Statement of Work (SOW) that reflect changes to the SSHP must be approved by the CEHNC Contracting Officer.

1.1.1.3 The objective of this plan is to provide a mechanism for establishing safe working conditions. The safety organization and procedures have been established following an analysis of potential hazards at the site. Specific hazard control methodologies have been evaluated and selected in an effort to minimize the potential for accident or injury.

1.1.1.4 All site operations will be performed in accordance with applicable state, local, and HFA regulations and procedures, OSHA requirements, and client requirements. All HFA employees and subcontractors will comply with the requirements of this plan. All site personnel will exercise caution at all times and immediately report any site conditions which may pose safety or health hazards to personnel.

1.1.2 SITE/FACILITY LOCATION

1.1.2.1 The Former West Virginia Maneuver Area consists of approximately 10,215 acres and is located approximately 35 to 40 miles east of Elkins, West Virginia. The work areas are divided into 3 sub-areas located in the Dolly Sods North Area (See Site Map). They total approximately 216.3 acres and are designated as:

1.1.2.1.1 Twenty-three miles of trails and 20 feet on each side. Total area acreage is 114.3.

1.1.2.1.2 Blackbird Knob with a total area acreage of 98.9.

1.1.2.1.3 Seventy-five camp sites, three cabin sites, and one trailer dump site. Total area acreage is 3.1.

1.1.3 PHYSICAL CHARACTERISTICS OF THE SITES

1.1.3.1 The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

1.2 EVALUATION OF CONTAMINATION

1.2.1 Based on information obtained during on-going ordnance and explosive removal activities at Dolly Sods Wilderness Area, there is no hazardous, toxic, radioactive or CWM contamination at the site. The HTRW threat is classified as low, therefore, personnel will be dress-out in Level "D" personal protective equipment.

1.2.2 During the removal action, evidence of OE contamination indicated a large amount of small arms, 60mm mortars, 81mm mortars, 4.2" mortars, 57mm projectiles, 105mm projectiles, and 155mm projectiles.

1.3 INTRUSIVE OPERATION FRAGMENTATION DISTANCE

1.3.1 The maximum fragmentation distance is based on where the explosives effects of the UXO will not produce personnel casualties. The maximum fragmentation distance during intrusive operations was established on the worst known scenario, a detonation of a 155mm projectile on or near the surface. The maximum fragmentation was developed by CEHNC Blast Effect personnel and is 1,699 feet.

1.3.2 All unauthorized personnel will be kept outside the maximum fragmentation distance. If any unauthorized persons enter this exclusion zone, clearance operations will cease until the people are cleared from the area.

1.4 DISPOSAL OPERATION SAFE FRAGMENTATION/BLAST DISTANCES

1.4.1 The safe fragmentation/blast distances during demolition activities will be based on the size and quantity of UXO be disposed. Table 1 of Annex 1 identifies the minimal safe fragmentation and blast distances for the OE items identified during the site visit. These distance will be reduced through the use of tamping material (i.e., earth or sandbags).

1.5 POLICY STATEMENT

1.5.1 It is the policy of HFA to provide a safe and healthful work environment for all its employees. HFA considers no phase of operations or administration to be of greater importance than the prevention of injury and illness. Every occupational illness, accident, injury, and spill is avoidable, and HFA will take every reasonable step to reduce the possibility of injury, occupational illness, accident or spill.

1.5.2 We believe in two fundamental principles of safety: all accidents, injuries and occupational illnesses are preventable and/or reducible. To put these principles into practice, every employee will receive the appropriate training, equipment, and other resources necessary to complete assigned tasks in a safe and efficient manner.

1.5.3 There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision.

1.5.4 This SSHP prescribes the procedures that must be followed by all site personnel. Operational changes which could affect the health and safety of personnel, the community, or the environment will not be made without prior approval of the Project Manager, H&S Manager, CIH, and the CEHNC Contracting Officer.

1.6 REFERENCES

1.6.1 This SSHP complies with applicable OSHA and EPA regulations. This plan follows the guidelines established in the following documents:

- Standard Operating Safety Guides (United States Environmental Protection Agency (EPA) July 1988);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (National Institute for Occupational Safety and Health (NIOSH) 85-115);
- Title 29 of the Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120) (United States Department of Labor/Occupational Safety and Health Agency (USDOL/OSHA));
- Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities ER 385-1-92;
- Safety and Health Requirements Manual EM 385-1-1 (United States Army Corps of Engineers (USACE), Revised October 1992);
- AR 385-40, USACE Supplements, Accident Reporting and Records;
- TM 60A-1-1-31, EOD Disposal Procedures;
- DOD 6055.9 - STD, DOD Ammunition and Explosives Safety Standards; and
- NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

CHAPTER 2
HAZARD/RISK ANALYSIS

2.1 Preliminary evaluation has been conducted using available information from site characterization data and task hazard information. The Hazard Analysis forms (See Annex 2) reflect the hazards anticipated for this site and the potential risk to personnel. The Hazard Analysis forms also indicate the hazard control and mitigation methods and procedures, and any specialized equipment, training or inspection which may be required to safely perform given tasks. The types of hazards which can be expected during removal activities include: exposure to explosives and explosive residue, biological, and physical hazards. Biological and physical hazards will be consistent throughout the site with variations attributed to the amount of vegetation at the site, the ruggedness of the terrain, etc.

2.2 All known or potential hazards that may pose a threat to the health and safety of site personnel have been identified and the risk of exposure assessed to ensure personnel are informed and protected. All site personnel must conduct evaluation of the work site characteristics and hazards throughout the duration of the project. All personnel will be alert to recognizing hazards at the site and bring them to the attention of supervisors.

2.3 The probability of occupational exposure is greatest by exposure to physical and biological site hazards. The potential for exposure to military chemical agent is not anticipated, based on previous site removal activities and the Archive Search Report.

2.4 SCOPE OF WORK

2.4.1 HFA will perform an ordnance, ammunition, and explosive removal action of the sites described in the following paragraphs. Campsites vary in size and the width of hiking trails vary from a narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one feet to include 20 feet on either side of the trail. Each of the campsites will be subsurface cleared to a depth of 4 feet. Blackbird Knob will be subsurface cleared to a depth of one foot. Working in these areas requires close coordination between the on-site Forest Service representative and HFA's SUXOS. No brush and tree cutting, trimming or clearance will be done on this site, areas where the brush is to thick to penetrate and efficiently sweep will be left undone and appropriately marked on their respective grid sheets.

2.4.2 This will include the following tasks:

- Location Surveying and Mapping/Site Preparation;
- Ordnance and Explosive Removal;
- Turn-in of Recovered OE-Related Scrap; and
- Quality Control.

2.5 JOB HAZARD ASSESSMENT BY TASK

2.5.1 The Hazard Assessment identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community, and the environment. Because of the complexity and numerous locations in the project, supervisors must continually inspect the work site to identify potential hazards. At any time during site activities drums, medical waste, and any items not positively identified as Ordnance, Ammunition or Explosives or related scrap or benign (Non-HTW) metal scrap are encountered, employees will not handle or manipulate them under this SSHP. Work will discontinue until the Project Manager, SUXOS, CEHNC Safety Specialist, and the Health and Safety Manager have been notified and the situation evaluated.

2.5.2 If a UXO cannot be positively identified as conventional ordnance, personnel will cover the item with plastic and immediately evacuate the area in an upwind direction. The UXO Supervisor will notify the SUXOS and CEHNC Safety Representative, who will in turn request EOD support personnel.

2.5.3 SURVEYING AND MAPPING BOUNDARIES AND GRIDS/SITE PREPARATION

2.5.3.1 HFA will establish the area boundary, grids, and lanes on the site. These activities will include other site preparation (surveying and identifying areas of heavy concentration of contamination) activities prior to conducting UXO clearance operations. If a subcontracted surveyor is going to be used, they will be provided with a UXO escort equipped with a magnetometer. The spot where a stake is to be driven into the ground will be checked for anomalies. If an anomaly is present, it will be cleared or another spot will be selected.

2.5.3.2 NO brush will be cut, trimmed or removed at any place within this site. There will be NO power or hand operated cutting machinery or tools used or allowed within the Dolly Sods Wilderness Area. Therefore the precautions normally applied for the protection of HFA personnel are not applicable.

2.5.3.3 Physical Hazards

2.5.3.3.1 During this task, employees will be exposed to various slip, trip, and fall hazards. Care and attention must be paid to where employees are walking (especially on the slope of the hills) since hidden debris can result in puncture wounds or lacerations. Biological hazards such as poisonous plants, insects, and animals may also be a concern during this and all other tasks associated with this project. Heat stress and cold stress may be concern during this and all other tasks associated with this project. Paragraph 2.8.2 and 2.9, include a thorough discussion on the signs and symptoms of heat and cold stress.

2.5.3.4 Chemical Hazards

2.5.3.4.1 The potential for exposure to chemical hazards during this phase will be minimal.

2.5.4 ORDNANCE AND EXPLOSIVES REMOVAL ACTION

2.5.4.1 HFA will perform a surface/subsurface clearance of OE; mapping; and disposal of all OE within the designated areas. This removal action will include the removal and disposal of all OE, OE-Related (2" or greater in size) and Non-OE-Related scrap. This will be accomplished using visual sweep, magnetometers, and hand shoveling of anomalies.

2.5.4.2 Physical Hazards

2.5.4.2.1 The physical hazards involved in this task are related to the location and removal of suspected UXO. UXO poses a significant threat to people if the UXO are not carefully controlled. There exists a chance for the UXO to detonate if it is not safely handled. Employees must pay careful attention to what they are doing or risk serious injury. Handling procedures for preventing explosion of UXOs are careful removal, placement of items in proper transport containers, and maintaining positive control at all times.

2.5.4.3 Chemical Hazards

2.5.4.3.1 The potential for airborne exposure during this phase is not anticipated. However, employees must be alert for signs and symptoms of chemical and explosive exposure as described in paragraph 2.7. If any unusual conditions arise concerning the release of liquid, vapors, and gases, work will immediately cease and personnel will be evacuated.

2.5.5 TURN-IN OF RECOVERED INERT ORDNANCE AND OE-RELATED SCRAP

2.5.5.1 HFA will collect inert ordnance and OE-related scrap (2" or greater in size) from the project sub-areas. This scrap will be turn-in to the nearest DRMO. If the DRMO refuses to accept the scrap, arrangements will be made with a local scrap contractor to pick up the scrap at no cost to the government.

2.5.5.2 Physical Hazards

2.5.5.2.1 The physical hazards involved with this task are related to the removal of scrap. Employees must pay particular attention to what they are doing or risk injury. Handling procedures for preventing injuries will include wearing gloves, lifting with the legs, placing scrap in proper containers, and maintaining positive control of the scrap at all times.

2.5.5.3 Chemical Hazards

2.5.5.3.1 The chemical hazards involved with this project are minimal. Care will be taken to avoid being cut while handling scrap items, thus preventing infection.

2.5.6 QUALITY CONTROL

2.5.6.1 HFA will administer a Quality Control (QC) Program to manage, control, and document all

activities. This QC sampling action will include observing/inspecting field operations and verifying that all OE contamination, plus OE-Related scrap has been removed from the removal grids.

2.5.6.2 Physical Hazards

2.5.6.2.1 The physical hazards involved in this task are related to the location and removal of suspected UXO. UXO poses a significant threat to personnel if they are not carefully controlled. Employees must pay careful attention to what they are doing or risk serious injury. Handling procedures for preventing explosion of UXOs include careful handling, removal, placement of items in proper transport containers, and maintaining positive control of the items at all times.

2.5.6.3 Chemical Hazards

2.5.6.3.1 The potential for airborne exposure during this phase is not anticipated. However, employees must be alert for signs and symptoms of chemical and explosive exposure as described in paragraph 2.7. Should any release of liquid, vapors, or gases occur, work will immediately cease and personnel will be evacuated.

2.5.6.4 Biological Hazards

2.5.6.4.1 The potential for exposure to biological hazards during this phase will be minimal. Personnel will be alert for signs and symptoms of biological exposures discussed in Section 2.10.

2.6 SAFETY

2.6.1 HEAVY EQUIPMENT, EARTH MOVING MACHINERY(EMM)

2.6.1.1 EMM or other heavy equipment will not be used at this site.

2.6.2 CONFINED SPACE ENTRY

2.6.2.1 Authorized field activities at this site do not include entry into areas which could be considered confined spaces. The field activities planned at this site will not create a confined space. If a confined space is encountered, and it is determined that entry is required, then a written confined space plan will be developed IAW 29 CFR 1910.146 and 1926 and submitted for approval. **The Contracting Officer must approve the plan before work can take place in a confined space.**

2.6.3 ELECTRICAL

2.6.3.1 There are no above or below ground utility lines to pose a hazard to team members during field activities.

2.6.4 ULTRAVIOLET RADIATION

2.6.4.1 The sun emits ultraviolet radiation (UV) as heat and light. The skin's natural defense

mechanisms attempt to reject the UV by distributing melanin pigmentation where needed. However, overexposure to direct sunlight can cause inflammation or blistering of the skin (sunburn). The optional use of long sleeve shirts and wide brim hats can help prevent sunburn. Chronic exposure to UV radiation is known to cause skin cancer. In case of sunburn, do not apply burn ointment, cold cream or butter, to relieve pain. Use a dry dressing and get medical attention for severe, extensive sunburns.

2.6.5 LIGHTNING

2.6.5.1 Electrical storms commonly occur in the Dolly Sods region during spring and summer. The resulting lightning poses a safety hazard to field personnel. Since the storms are sometimes fast moving, field personnel should watch for indications of electrical storms. The distance to an electrical storm can be estimated by observing the interval between the lightning flash and the sound of thunder. Since sound travels approximately 1,100 feet per second, an interval of 5 seconds corresponds to a storm distance of approximately 1 mile.

2.6.5.2 If an electrical storm is observed within five miles of the sites, field personnel will cease outside activities and proceed to the site office for further instructions. If caught in the open by an electrical storm, all personnel will immediately seek shelter in their vehicle and proceed as above. In the event that their vehicle is inaccessible, they will move to a topographically low area away from tall objects and conductors (e.g., transformer, power lines, metal sheds) and wait for the storm to leave the area.

2.6.6 WALKING AND WORKING IN MOUNTAIN TERRAIN

2.6.6.1 Field personnel will become familiar with the general terrain of the site and potential physical hazards (fallen trees, streams and rivers, uneven terrain) which would be associated with accidental slips, trips, and falls.

2.6.6.2 Be cautious after periods of heavy rainfall, which may cause earth movement and slides, and also cause streams and rivers to rise and run swiftly.

2.6.6.3 Be attentive where you walk since pits, holes, or similar hazards may be partially covered or visually obstructed by vegetation, or water.

2.6.6.4 Be cautious around soil or terrain which recently may have been disturbed, relocated, or otherwise made less stable.

2.6.6.5 Avoid the top edges of drop-off areas whether they have been disturbed or not.

2.6.6.6 All personnel will wear orange safety vests.

2.6.7 HAZARD COMMUNICATION

2.6.7.1 In order to comply with the OSHA Hazard Communication standard 29 CFR 1910.1200 and

to ensure that site personnel are informed of hazards associated with the materials with which they could work, the following will apply to all commercial products containing hazardous materials which are brought on-site:

2.6.7.1.1 MSDS's (See Annex 3) will be maintained for each product containing a hazardous substance on-site.

2.6.7.1.2 All containers will be adequately labeled.

2.6.7.1.3 All personnel will be trained in accordance with 29 CFR 1910.1200 and Chapter 4 of the SSHP.

2.6.7.1.4 An inventory of all products containing hazardous substances used on-site will be maintained and available to the site HazMat team.

2.7 CHEMICAL HAZARDS

2.7.1 This section discusses the potential chemical hazards associated with the Former West Virginia Maneuver Area and Dolly Sods North Area. The potential air release of toxic, flammable, and radioactive hazards is not anticipated at this site. However, precautions will always be taken to minimize the potential of contact with Hazardous, Toxic, Radioactive Waste (HTRW) and Chemical Warfare Material (CWM). The Health and Safety Manager will update this section as information developed during this project warrants.

2.7.2 The potential exposure to explosive chemical hazards or chemical warfare material on this site is not anticipated. However, if UXOs are eroded to a condition where the explosive is exposed, there exists a slight possibility of chemical exposure through skin absorption. There is no hazard from inhalation since the explosives are cast into the round. Therefore, if personnel are required to move UXO to the demolition site, outer leather gloves and inner nitrile gloves will be worn if UXO showing exposed explosives are encountered. The explosives sections of (See Tables 2 and 3 of Annex 1) refer to the possible contamination from the residues of UXO being detonated and demolition materials that may have been used.

2.7.3 If a scenario is encountered that precludes detonating a UXO in place, an unidentifiable UXO is found, or a suspected toxic chemical munition is found, the on-site CEHNC Safety representative will be notified, who in turn will request EOD support.

2.7.4 CHEMICALS OF CONCERN

2.7.4.1 Table 2 of Annex 1, identifies contaminants which may pose an occupational health threat.

2.7.5 EXPOSURE LIMITS

2.7.5.1 Occupational exposure limits are based on experimental and epidemiological studies and are promulgated by organizations such as Occupational Safety and Health Administration (OSHA), the

American Conference of Governmental Industrial Hygienists (ACGIH), and the National Institute of Occupational Safety and Health (NIOSH). Each organization assigns a different term to its exposure limit: OSHA establishes permissible exposure limits (PEL), the ACGIH develops threshold limit values (TLV), and NIOSH publishes recommended exposure limits (REL). A central concept in the development of exposure limits is the dose-response relationship between a given substance and the health effects associated with exposure to the substance. The exposure limits do not guarantee a discrete, fixed boundary between "safe" and "unhealthful." The effect of a given substance varies with each individual and environmental conditions such as temperature, humidity, exposure concentration, route of entry, and the presence of other substances.

2.7.5.2 The PEL, TLV, and REL are not interchangeable or equivalent. Of the three, only the PEL is legally enforceable; the TLV and REL are guides which recommend limits below which the ACGIH and NIOSH believe nearly all workers may be exposed repeatedly, for eight hours per day (TLV) or ten hours per day (REL)and 40 hours per week without adverse side effects. Although the TLV and REL are not law, they frequently become law when they are incorporated into codes, regulations, and standards.

2.7.5.3 The exposure limits listed in the section are time-weighted averages, based on exposures for eight hours per day (TLV) or ten hours per day (REL) and 40 hours per week unless otherwise noted.

2.7.6 RECOGNITION OF SYMPTOMS AND SIGNS

2.7.6.1 Table 3 of Annex 1, summarizes the symptoms and effects of exposure for each substance identified as a potential contaminant.

2.8 PHYSICAL HAZARDS

2.8.1 NOISE

2.8.1.1 Direct sources of noise may be produced by vehicles, heavy equipment, and electrical equipment and detonations. Personnel operating equipment will wear appropriate hearing protection (ear plugs or ear muffs) if the noise levels exceed the permissible exposure limits. Hearing protection will also be necessary in the vicinity of heavy equipment if potentially harmful noise levels are projected into the work area.

2.8.1.2 A standard guideline for knowing when hearing protection is required is, if people three feet apart must raise their voices to be heard in normal conversation. The Threshold Limit Value for noise is 85 dBA (85 decibels on the A-weighted scale).

2.8.1.3 The SSO will perform noise monitoring whenever equipment or machinery being used on-site creates a high noise exposure potential. When 85 dBA, 8 hour TWA, is reached, the SSO will issue personal hearing protection devices and perform noise dosimetry to evaluate the workers' 8 hour TWA exposure.

2.8.1.4 The noise TLVs in Table 4 of Annex 1, refer to sound pressure levels and durations of

exposure that represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effects on their ability to hear and understand normal speech.

2.8.2 HEAT STRESS

2.8.2.1 Field operations during the summer months can create a variety of hazards to the employee. Heat cramps, heat exhaustion, and heat stroke can be experienced and, if not remedied, can threaten life or health. Therefore, it is important that all employees are able to recognize the symptoms of these conditions and be capable of resolving them as quickly as possible. The work-rest regime and monitoring for heat stress is detailed in Chapter 8 of this SSHP.

2.8.2.2 The Effects of Heat

2.8.2.2.1 As the result of normal oxidation processes within the body, a predictable amount of heat is generated. If the heat is liberated as it is formed, there is no change in body temperature. If the heat is liberated more rapidly, the body cools to a point at which the production of heat is accelerated and the excess is available to bring the body temperature back to normal.

2.8.2.2.2 Interference with the elimination of heat leads to its accumulation and thus to the elevation of body temperature. As a result, the person is said to have a fever. When such a condition exists, it produces a vicious cycle in which certain body processes speed up and generate additional heat. Then the body must eliminate not only the normal but also the additional quantities of heat.

2.8.2.2.3 Heat produced within the body is brought to the surface largely by the bloodstream and escapes to the cooler surroundings by conduction and radiation. If air movement or a breeze strikes the body, additional heat is lost by convection. However, when the temperature of the surrounding air becomes equal to or rises above that of the body, all of the heat must be lost by vaporization of the moisture or sweat from the skin surface. As the air becomes more humid (contains more moisture), vaporization from the skin slows down. Thus, on a day when the temperature is 95 to 100°F, with high humidity and little or no breeze, conditions are ideal for the retention of heat within the body. It is on such a day, or more commonly a succession of such days (a heat wave), that medical emergencies due to heat are likely to occur.

2.8.2.3 Heat Cramps

2.8.2.3.1 Heat cramps usually affect people who work in hot environments and perspire a great deal. Loss of salt from the body causes very painful cramps of the leg and abdominal muscles. Heat cramps also may result from drinking iced water or other drinks either too quickly or in too large a quantity.

2.8.2.3.1.1 Heat Cramps Symptoms

- Muscle cramps in legs and abdomen
- Pain accompanying the cramps
- Faintness
- Profuse perspiration

2.8.2.4 Heat Exhaustion

2.8.2.4.1 Heat exhaustion occurs in individuals working in hot environments, and may be associated with heat cramps. Heat exhaustion is caused by the pooling of blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The blood vessels in the skin become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when an individual is in an upright position, may lead to an inadequate return of blood to the heart and eventually to physical collapse.

2.8.2.4.2 Heat Exhaustion Symptoms

- Weak pulse
- Rapid and usually shallow breathing
- Generalized weakness
- Pale, clammy skin
- Profuse perspiration
- Dizziness
- Unconsciousness
- Appearance of having fainted (the patient responds to the same treatment administered in cases of fainting)

2.8.2.4.3 Heat Exhaustion Emergency Care

- Remove the patient to a cool place and remove as much clothing as possible.
- Administer cool water, "Gatorade,"or its equivalent.
- If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling.
- Treat the patient for shock, and remove him/her to a medical facility if there is any indication of a more serious problem.

2.8.2.5 Heat Stroke

2.8.2.5.1 Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness, and even death. Direct exposure to sun, poor air circulation, poor physical condition, and advanced age (over 40) bear directly on the tendency to heat stroke. It is a serious threat to life and carries a 20 percent mortality rate. Alcoholics are extremely susceptible.

2.8.2.5.2 Heat Stroke Symptoms

- Sudden onset
- Dry, hot, and flushed skin
- Dilated pupils
- Early loss of consciousness
- Full and fast pulse

- Breathing deep at first, later shallow and almost absent
- Muscle twitching, growing into convulsions
- Body temperature reaching 105°F to 106°F or higher

2.8.2.5.3 Heat Stroke Emergency Care

- Remember that this is a true emergency.
- Transportation to a medical facility should not be delayed.
- Remove the patient to a cool environment if possible, and remove as much clothing as possible.
- Assure an open airway.
- Reduce body temperature promptly, preferably by wrapping in a wet sheet or else by dousing the body with water.
- If cold packs are available, place them under the arms, around the neck, at the ankles, or at any place where blood vessels that lie close to the skin can be cooled.
- Protect the patient from injury during convulsions, especially from tongue biting.

2.8.2.6 Avoidance of Heat-Related Emergencies

2.8.2.6.1 In the case of heat cramps or heat exhaustion, "Gatorade" or its equivalent is suggested as part of the treatment regime. The reason for this type of liquid is that such beverages will return much-needed electrolytes to the system. Without these electrolytes, body systems cannot function properly, thereby increasing the represented health hazard. Therefore, when personnel are working in situations where the ambient temperatures and humidity are high, and especially in situations where protection Levels A, B, and C may be required, the site safety officer must:

2.8.2.6.2 Assure that all employees drink plenty of fluids.

2.8.2.6.3 Assure that frequent breaks are scheduled so overheating does not occur.

2.8.2.6.4 Revise work schedules, when necessary, to take advantage of the cooler parts of the day (e.g., 5:00 a.m. to 1:00 p.m. and 6:00 p.m. to nightfall).

2.8.2.6.5 Assure that workers are acclimated before allowing them to work for extended periods. Heat induces a series of physiological and psychological stresses that the individual worker must adjust to during the first week of heat exposure. Workers should slowly work into their peak work performance over a two-week period. Workers absent from the site several days must be allowed to become re-acclimated.

2.9 COLD STRESS

2.9.1 The effects experienced by site personnel when working in cold environments depend upon environmental and personal factors, such as air temperature, windspeed, duration of exposure, PPE worn, type of work, level of physical effort, and health status of the worker. Overexposure can cause significant stress upon the body, which can lead to serious and permanent injury. The following

paragraphs discuss the most common cold stress disorders, their signs, symptoms, effects, and control techniques.

2.9.2 Cold Stress Disorders

2.9.2.1 Frostbite

2.9.2.1.1 Frostbite occurs when the water contained in body tissues freezes. This usually occurs when temperatures are below freezing, but excessive wind can result in frostbite with temperatures above freezing. The extremities are usually effected first, since the body's initial response to cold stress involves decreasing bloodflow to the extremities, resulting in heat loss. During the initial phases of frostbite, the skin may have a prickly or tingling sensation and will later become numb with cold. The appearance of the effected skin may range from superficial redness to white, hard, frozen looking tissues.

2.9.2.2 Hypothermia

2.9.2.2.1 Hypothermia results when the body loses heat faster than it can be produced. This occurs when the blood vessels in the skin and extremities constrict, reducing bloodflow to those areas which have a high surface area to volume ratio. The reduction in blood flow reduces heat loss and usually effects the extremities first. Some of the symptoms include; pain, numbness, shivering, speech difficulty, reduced mental alertness, forgetfulness, loss of manual dexterity, collapse, unconsciousness, and finally, death.

2.9.3 Treating Cold Stress Disorders

2.9.3.1 Cold stress treatment is to bring the deep body core temperature back to its normal temperature of 98.6° F. Personnel exhibiting signs and symptoms of cold stress should be brought to a warm area and allowed to rest and warm up. Warm, non-alcohol, decaffeinated drinks (not coffee) or soup should be given to increase body temperature, and rewarming should be gradual.

2.9.3.2 Frostbite Emergency Treatment

2.9.3.2.1 The victim should be sheltered from the wind and cold and given warm drinks. If superficial, the frozen area(s) should be covered with extra clothing or blankets or warmed against the body. Do not use direct heat, and do not pour hot water over or rub the effected area(s). Warming should be gentle and gradual. Failure to do this could lead to bleeding in the tissues and increase the possibility of infection. If the frostbite is deep, (the effected area is frozen and hard to the touch), immediate medical attention should be obtained.

2.9.3.3 Hypothermia Emergency Treatment

2.9.3.3.1 All stages of hypothermia are treated by either passive or active rewarming. This is accomplished by better conservation of the patient's body heat. However, the victim's thermoregulatory mechanisms must be intact. It is important to note that if a victim is found in a

remote area, despite the death-like appearance, the person may be saved. All attempts should be made to revive the victim. Active rewarming means heat is applied to the victim by an external source, either to the skin surface and/or through the core. Treatment includes:

2.9.3.3.2 Preventing further heat loss. Remove the victim to a warm, dry place (out of wind, cold, and rain/snow.)

2.9.3.3.3 Remove wet clothing piece-by-piece and dry underlying skin.

2.9.3.3.4 Re dress the victim in several layers of warm, dry clothing, giving preference to the central body core rather than the extremities.

2.9.3.3.5 Cover the victim's head, then wrap the victim in blankets.

2.9.3.3.6 If the victim is conscious, allow him/her to drink hot fluids.

2.9.3.3.7 Monitor oral body temperature every 15 minutes. If body temperature falls below 96.8° F, the team member should not be allowed outside until body temperature returns to normal.

2.9.3.3.8 In more severe cases of hypothermia, implement the above treatment but also institute some type of active rewarming, including:

- Electric pads or blankets
- Hot-air blowers or heaters
- Heated blankets or clothes
- Use of human body heat

2.9.3.3.9 It is important to watch for signs of the return of normal thermoregulatory mechanisms (shivering, teeth chattering, "goose flesh", etc.) and to monitor the victims mental status.

2.9.3.3.10 The victim should be transferred to a medical facility after the emergency care steps have been initiated and should not be allowed to return to work for at least 48 hours.

2.9.3.3.11 If there has been severe hypothermia, the victim should not be considered dead, despite his/her appearance. Treat the victim as stated above and prepare to transfer to a medical facility. If the victim is pulseless and not breathing, perform CPR.

2.9.4 Avoiding Cold-Related Emergencies

2.9.4.1 In cold environments, the SSO will use tailgate safety meetings to inform personnel of temperature and wind conditions anticipated for that day's activities. The SSO will advise personnel of the general practices, listed below, that can be utilized in the prevention and control of cold stress.

2.9.4.1.1 Wearing layered clothing, including a water repellant outer layer.

2.9.4.1.2 Wearing gloves, socks, and a hat that are synthetic or wool insulated.

2.9.4.1.3 Removing outer layers of clothing during breaks to prevent inner layers from getting wet from perspiration.

2.9.4.1.4 Eating well balanced meals and maintaining adequate intake of fluids.

2.9.4.1.5 Seeking shelter in a warm protected area when signs and symptoms of cold stress become evident.

2.10 RADIOLOGICAL HAZARD

2.10.1 Radiological hazards are not anticipated and monitoring is not required, based on the information from the EE/CA sampling of the sites.

2.11 BIOLOGICAL HAZARDS

2.11.1 POISONOUS PLANTS

2.11.1.1 Poisonous Plant Avoidance Procedures

2.11.1.1.1 The best way to prevent symptoms from poisonous plants is to avoid them. This is accomplished by learning to recognize the various poison plants (See Figure 2-1 of Annex 1) and stay away from them. Poison ivy and oak are identified by three leaves and sumac with five leaves radiating from a stem. Poison ivy is a vine, while oak and sumac are bush-like. The plant tissues have an oleoresin which is active in live, dead, and dried parts. The oleoresin may be carried via smoke, dust, contaminated clothing, and hair.

2.11.1.2 First Aid for Poisonous Plants

2.11.1.2.1 Signs and symptoms included redness, swelling, and sometimes intense itching. Blisters form during the subsequent 24 to 36 hours. Crusting and scaling occurs within a few days. In the absence of complications, healing is complete in about ten days. Wash any exposed skin with a mild soap and water; do not scrub the area.

2.11.2 INSECTS AND TICKS

2.11.2.1 Ants, Bees, Wasps, and Hornets

2.11.2.1.1 Stings of these insects are responsible for more deaths in the United States than bites and stings of all other venomous creatures. This is due to the sensitization by the victim to the venom from repeated stings, which can result in anaphylactic reactions. The stinger may remain in the skin and should be removed by teasing or scraping rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic-corticosteroid lotion is often used. People with known hypersensitivity to such stings should carry a kit containing antihistamine and epinephrine.

2.11.2.1.2 With these things in mind and with the probability of contact with stinging insects, all personnel will comply with the following work practices:

2.11.2.1.2.1 If a worker knows he is hypersensitive to bee, wasps or hornet stings, he will inform the SSO of this condition prior to site activities and carry a kit similar to that listed above.

2.11.2.1.2.2 All site personnel will be watchful for the presences of stinging insects, any nest location will be flagged off and site personnel notified of its location.

2.11.2.1.2.3 A can of wasp spray will be carried by each team.

2.11.2.1.2.4 If stung, immediately notify the SSO to obtain treatment and be observe for allergic reaction.

2.11.2.1.2.5 Personnel with a known hypersensitivity are required to keep emergency medication on or near their persons at all times.

2.11.2.2 Ticks and Tickborne Diseases

2.11.2.2.1 Lyme Disease

2.11.2.2.1.1 Lyme disease is an illness caused by a bacterium which may be transmitted by the bite of the tick *Ixodes dammini*, commonly referred as the deer tick. Not all ticks are infected with the bacterium; however, when an infected tick bites, the bacterium is passed into the bloodstream of the host where it multiplies. Current findings indicate that the tick must be attached to its host for several hours to transmit the bacterium. The deer tick is commonly found on-site living in grassy and wooded areas feeding on mammals such as mice, shrews, raccoons, opossums, deer, and humans.

2.11.2.2.1.2 The illness typically occurs in the summer and is characterized by a slowly expanding red rash that develops in a few days to a few weeks after the bite of an infected tick. This may be accompanied by flu-like symptoms along with headache, stiff neck, fever, muscle aches, and/or general malaise. At this stage, treatment by a physician usually is effective. If left alone, these early symptoms may disappear, but more serious problems may follow. The most common late symptom of the untreated disease is arthritis. Other problems which may occur include meningitis, neurological abnormalities, and cardiac abnormalities. It is important to note that some people do not get the characterized rash and may have diminished progress to the later manifestations. Treatment of later symptoms is more difficult than early symptoms and is not always successful.

2.11.2.2.2 Tick Avoidance Procedures

2.11.2.2.2.1 When in an area suspected of harboring ticks (grass, bushes, woodland) the following precautions can minimize the chances of being bitten by a tick:

- Wear work clothing/coveralls
- Wear light colored clothing so ticks can be easily spotted.
- Attempt to avoid, and/or not linger on game trails.

- Wear tick repellents.
- Do not sit on ground.
- Inspect clothing frequently while in tick habitat.
- Perform a personal inspection for ticks after being in a suspected area, closely inspecting legs, groin, neck, ears, and hair.

2.11.2.2.3 First Aid for Tick Bites

2.11.2.2.3.1 Removal of ticks is best accomplished using small tweezers. Do not squeeze the tick's body. Grasp it where the mouth parts enter the skin and tug gently, but firmly, until it releases its hold on the skin.

2.11.2.2.3.2 Wipe the bite thoroughly with an antiseptic and notify the safety officer as soon as possible. The various stages and symptoms are well recognized and if detected can be treated with antibiotics. Early detection and treatment with antibiotics significantly reduces the severity of Lyme disease. If necessary, seek medical attention.

2.11.2.3 Spiders

2.11.2.3.1 Black Widow Spider

2.11.2.3.1.1 The black widow spider ranges in color from gray to brown to black, depending on the species. The abdomen is shiny black with a red hourglass. The person bitten may recall receiving a sharp, pinprick-like bite, but in some cases the bite is so minor that it goes unnoticed. Rarely is there any local skin reaction. The initial pain is sometimes followed by a dull, occasionally numbing pain affecting extremity, and by pain and cramps in one or several of the large muscles. Sweating and weakness are common, as well as varying degrees of headache and dizziness. In severe cases, there is rigidity of the abdominal muscles and pain in the lower back, thighs, or abdomen. There is no effective first aid treatment. Treat for shock and transport to the nearest medical facility.

2.11.2.3.2 Brown Recluse Spider

2.11.2.3.2.1 The brown recluse spider has an abdomen which ranges in color from grayish through orange and reddish-brown to dark brown. The bite of the spider produces about the same degree of pain as the sting of an ant, but sometimes the person is completely unaware of the bite. A localized burning sensation develops which may last for 30 to 60 minutes. The area often itches, becomes red and warm, with a small blanched area around the immediate bite. The reddened area enlarges and becomes purplish during the subsequent one to eight hours. A small blister forms at the bite site, increasing in size and subsequently ruptures. The whole area may become swollen and painful. Some other symptoms include fever, stomach cramps, nausea, and vomiting. In severe cases, there may be breakdown of the red blood cells, renal failure, and death. All first aid measures should be avoided as the natural appearance of the bite is most important in determining the diagnosis. Treat for shock and transport to the nearest medical facility.

2.11.2.4 Poisonous Snakes

2.11.2.4.1 Snake Avoidance Procedures

2.11.2.4.1.1 The best avoidance procedure is to be familiar with snake habitat, and observation in the field. Snakes can be found under debris and overgrown vegetation. All field personnel will exercise caution and maintain alertness to this hazard when in the field.

2.11.2.4.2 First Aid for Snake Bites

2.11.2.4.2.1 All reactions from snakebites are aggravated by acute fear and anxiety. The severity of local and general reaction from poisonous snakebites depends upon the amount of venom injected and the speed of absorption, size of the victim, protection from clothing, speed at which anti-venom can be provided, and the location of the bite.

2.11.2.4.2.2 The basic rule is: **Treat all snakebites as poisonous**.

2.11.2.4.2.3 Instruct the patient to remain calm and keep the affected area below heart level, sit down and relax. Watch victim for signs of shock and monitor ABCs. Contact the UXO Supervisor for assistance, who will contact the SUXOS and the SSO via radio. SUXOS will call for an ambulance or transport the victim to the hospital. If possible, kill the snake and take it along with the patient to the medical facility for identification. This can greatly aid in proper treatment.

2.11.2.5 Animals

2.11.2.5.1 The only effective measure to preclude animal bites is avoidance. Contact with all wild animals at Dolly Sods Wilderness Area will be avoided at all times. Persons bitten by an animal should seek medical assistance immediately, especially if it is suspected that the animal is rabid. Aggressive or disoriented behavior, as well as foaming of the mouth can be signs of rabid animals. Until medical assistance can be reached, persons should watch for symptoms of severe swelling, nausea, and shock.

2.11.2.5.2 There are no known HantaVirus cases in the former Dolly Sods Wilderness Area. However, personnel will be alert for any rodent nest when performing intrusive activities. If a nest is encountered, excavation on that contact will cease **until a Personal Protective Equipment Plan requiring Level C PPE is approved by the Contracting Officer,** Level C PPE is donned, and the nest is treated with bleach.

CHAPTER 3
STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

3.1 PERSONNEL

3.1.1 All personnel are responsible for continuous adherence to these SSHP procedures during the performance of their work. No person may work in a manner that conflicts with the intent or the inherent safety and environment precautions expressed in these procedures. To ensure compliance with the provisions of this document, this section outlines the safety and health organizational structure and the roles and responsibilities of the personnel involved.

3.1.2 CERTIFIED INDUSTRIAL HYGIENIST (CIH)

3.1.2.1 The CIH is responsible for the oversight of HFA's Safety and Health Program and Site-Specific Safety and Health Plans. The CIH will approve all SSHPs by reading, signing, and dating them.

3.1.3 HEALTH AND SAFETY MANAGER (H&S)

3.1.3.1 The H&S Manager is responsible for developing and coordinating the SSHP and addenda as required. This plan complies with applicable regulations in all respects and includes medical surveillance and training requirements, hazard assessment, PPE specifications, field implementation procedures, and audits. The H&S Manager will issue addenda to the SSHP if changed conditions warrant. The H&S Manager is the contact for regulatory agencies on matters of safety and health.

3.1.4 PROJECT MANAGER

3.1.4.1 The Project Manager (PM) is responsible for ensuring that all project activities are completed in accordance with the requirements set forth in this plan.

3.1.5 SENIOR UXO SUPERVISOR

3.1.5.1 The Senior UXO Supervisor (SUXOS) is responsible to the PM for the direct supervision of UXO site activities. He is responsible for executing the requirements of the Work Plan (WP) and Site-Specific Safety and Health Plan (SSHP), and has the authority to stop and correct any evolution/situation that is not in accordance with the WP, SSHP, or other established standard practices. The SUXOS acts for the PM in his absence.

3.1.6 SITE SAFETY OFFICER (SSO)

3.1.6.1 The Site Safety Officer is responsible to the H & S Manager and CIH for all aspects on site safety. He advises the PM and SUXOS on all matters concerning site safety. He performs safety

inspections on site equipment and work practices to ensure they are in compliance with the WP, SSHP, and other established safety practices and procedures. The SSO conducts regular daily safety meetings as well as other safety training as required. He participates in all accident investigations and has the prime input concerning safety issues. He has the authority to stop any work that is not in conformance with the WP, SSHP, or other safety practices, and not allow work to continue until all deficiencies have been corrected. The SSO acts as the emergency coordinator during all site emergencies.

3.1.7 UXO SUPERVISOR

3.1.7.1 The UXO Supervisors are responsible for the direct supervision and safety of personnel under their control. They are responsible to ensure their workers comply with all provision of the WP and SSHP. UXO Supervisors may provide additional safety meetings and training as needed, specifically covering safety issues concerning their team members or work areas. They will report all violations of safety and personnel injuries to the SSO and SUXOS.

3.1.8 UXO SPECIALIST AND QUALITY CONTROL SPECIALIST

3.1.8.1 All UXO Specialists and Quality Control Specialist are required to comply with the provisions of this SSHP and all applicable federal, state and local regulations. Each person is responsible for their own safety and health for completing tasks in a safe and professional manner, and for reporting any unsafe acts or conditions to the SSO, SUXOS, or PM. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat stress and chemical exposure.

3.1.9 SUBCONTRACTORS AND VISITORS

3.1.9.1 On-site subcontractors and visitors are required to read and acknowledge their understanding of this SSHP. In addition, all personnel are expected to abide by the requirements of this SSHP and cooperate with UXO Supervisors to ensure a safe and healthful work site. All subcontractors and visitors are required to follow these requirements:

- Be escorted by an qualified UXO personnel;
- Report accidents and injuries, no matter how small;
- Report any symptoms of exposure to a hazardous substance; and
- Report any unsafe or malfunctioning equipment.

3.1.10 OCCUPATIONAL PHYSICIAN

3.1.10.1 Conmed, Inc., (Dr. H.M. Haft) provides direction and oversight for HFA, Inc.'s medical surveillance program. The medical examiner reviews the results of each medical examination and provides HFA with a letter summarizing the findings and evaluating fitness for work, including the use of respiratory protection. A copy of this letter is retained in the Waldorf, Maryland office.

3.1.10.2 Copies of the Physicians Statement in accordance with 29 CFR 1910.120 &134 will be maintained on-site for each employee at HFA's site command post.

CHAPTER 4
TRAINING

4.1 TRAINING & INITIAL INDOCTRINATION

4.1.1 All HFA UXO personnel working at this site have successfully completed Naval Explosive Ordnance Disposal Training (USNAVSCOLEOD), which details procedures for evaluating and disposing of UXOs containing high explosives and other fillers.

4.1.2 All employees who work at this job site will have completed a training program which complies with OSHA Regulations 29 CFR 1910.120e(9). HFA employees receive a training program which includes an equivalent of 40 hours of training off site and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. The following is a general list of topics covered in a 40 hour course:

4.1.2.1 Basic Safety Operations Training

4.1.2.1.1 This course stresses the fundamentals of safety including the causes and prevention of slip, trip, and fall hazards, confined space entry, heat and/or cold stress illness and prevention, and materials handling.

4.1.2.2 Hazards and Protection

4.1.2.2.1 This course deals with the identification, recognition, and safe work practices with toxic materials. The use and limitation of applicable protective clothing, respirators, and decontamination procedures. Respiratory fit-test is provided to each employee attending the course.

4.1.2.3 First Aid and CPR

4.1.2.3.1 It is necessary for some employees in this project group to have completed both first aid and CPR training.

4.1.2.4 Project Specific Safety Training

4.1.2.4.1 This course covers the mandates of a project health and safety plan. In particular, this stresses emergency response procedures, and physical and chemical health hazards.

4.1.2.5 Hazard Communications Training

4.1.2.5.1 This training covers how to detect the presence or release of a hazardous chemical, physical and health hazards of the chemical, how to protect yourself, the labeling system, and material safety data sheets information.

4.1.3 OSHA 8 HOUR SUPERVISOR AND 8 HOUR ANNUAL REFRESHER TRAINING

4.1.3.1 On-site management and supervisors will have received a minimum of eight hours of additional training on program supervision in accordance with 29 CFR 1910.120(e)(4). Each employee receives eight hours of refresher training annually in accordance with 29 CFR 1910.120(e)(8).

4.1.4 Table 5 of Annex1, lists the training dates for the 40 hours of HTRW, 8 hours annual refresher, 8 hours supervisor, and First Aid/CPR.

4.2 SITE SPECIFIC TRAINING

4.2.1 Site specific training will be given by the SSO and SUXOS to inform the UXO members of site specific hazards and hazardous activities. Training will be provided prior to initial site entry and each morning in conjunction with the daily tailgate safety meeting.

4.2.2 Specific site and safety training will be ongoing and conducted throughout the term of the Former West Virginia Maneuver Area project. Inclement days may be used for this purpose. When unforeseen circumstances or situations dictate the need for additional training, it will be provided as needed.

4.2.3 Daily safety briefings will be conducted on-site each morning. Topics will cover site specific hazards and safety aspects of that day's scheduled work.

4.2.4 Weekly meetings will be held for all supervisors. Topics for discussion will be the events of the previous week, safety discrepancies noted, corrective actions required or taken, and the next week's activities with special emphasis on safety.

4.2.5 SAFETY MEETINGS

4.2.5.1 Safety meetings will be conducted at the beginning of each workshift, or whenever new employees arrive on the job site. The health and safety considerations for the particular day's activities will be reviewed, and the protective equipment and other materials necessary to perform the work will be outlined.

4.2.5.2 All safety training and meetings will be documented in the SSO Daily Report.

4.2.6 MATERIAL SAFETY DATA SHEETS (MSDS)

4.2.6.1 MSDS will be obtained for every chemical product HFA introduces on-site and the potential chemical hazards that may be encountered. This information will be readily available to all employees upon request and kept on-site.

4.2.7 HEALTH & SAFETY PLANS

4.2.7.1 HFA prepares a SSHP for each project falling within the scope and application of 29 CFR 1910.120. The SSO presents the SSHP and discusses it with everyone assigned to the project. Site workers and site visitors must read and sign the SSHP acknowledging acceptance of site rules and understanding of site hazards before entering.

4.3 ADDITIONAL TRAINING

4.3.1 UXO site related training will be provided by HFA to all other non-UXO personnel working on this site. No personnel will be permitted to work on this project until they have received this training. Listed below are topics which will be included.

4.3.1.1 Project Scope

4.3.1.1.1 Project Scope training topics will include staff responsibilities; chain of command; relationship to other agency and contract personnel; and range history, facilities, access, egress, description, controls and other general information.

4.3.1.2 Safety

4.3.1.2.1 Safety training topics will include safe work practices; physical hazards; on/off-site emergencies; site and work area evacuation (routes); emergency numbers; emergency equipment; medical emergencies; and other safety information.

4.3.1.3 Personnel Protective Equipment (PPE)

4.3.1.3.1 All site personnel will receive training outlined in HFA's Personnel Protective Equipment Program.

4.3.1.4 Chemical Warfare Material (CWM) Training

4.3.1.4.1 Safety training regarding CWM will include the following topics: contamination avoidance; personal protection; decontamination procedures; buddy-aid; self-aid; first aid practices; engineering controls; explanation of MSDS; recognition of CWM signs, symptoms and odors; and evacuation/notification procedures.

4.3.1.4.2 Potential exposure to CWM materials on this site is not anticipated. If HFA UXO personnel encounter any UXO that cannot be positively identified as a conventional UXO, HFA personnel will withdraw from the site and request assistance from the nearest Technical Escort Unit (TEU) through the on site CEHNC Safety Specialist. HFA personnel will take emergency non-invasive actions such as covering the item with plastic sheeting and securing the area until the post authorities and TEU can establish the appropriate exclusion and safety zones.

4.3.1.5 Blood Borne Pathogen Training

4.3.1.5.1 As required by 29 CFR 1910.1030(g)(2), all personnel with a potential for occupational exposure to blood or other potentially infectious materials will receive training outlined in HFA's Blood Borne Pathogen Exposure Control Plan. Due to the hazards of working with UXO. All onsite personnel, when feasible, will receive the required training.

4.3.1.6 Hearing Conservation Training

4.3.1.6.1 As specified by 29 CFR 1910.95, all site personnel exposed to noise levels exceeding 85 dBA 8 hour time-weighted average (TWA) will receive training in the following topics; physical and psychological effects of high noise, noise exposure limits, purpose of hearing test, and selection, fitting, use, and limitation of hearing protection.

CHAPTER 5
PERSONAL PROTECTIVE PROGRAM

5.1 RESPIRATORY PROTECTIVE EQUIPMENT AND PROTOCOL

5.1.1 Personnel Protective Equipment (PPE) will be maintained at a level deemed appropriate to protect UXO personnel and other workers. No contamination is anticipated; therefore, normal working clothing will be Level D. A hardhat is not required unless a possible head injury could result from the use of heavy equipment and overhead hazards.

5.1.2 The level of protection used in the work is are based on what is known about the sites and the tasks to be accomplished. The levels of protection may be changed as site conditions change and information about the site becomes known. The decision to downgrade or upgrade will require consultation of the SUXOS and SSO. Under no circumstances will the level of protection be downgraded without seeking consultation and permission beforehand. If protection is upgraded or downgraded two levels beyond what is required by the SSHP, the SSO will immediately contact the Senior Project Manager and the Health and Safety Manager prior to conducting the task. Rationale for up or downgrading PPE is provided in Table 6 of Annex 1.

5.1.3 Level C PPE is not anticipated.

5.1.4 LEVEL D

5.1.4.1 The minimal level of protection that will be required of HFA personnel and subcontractors at the site will be Level D.

5.1.4.2 The following equipment will be used for Level D protection:

- Coveralls
- Boots/shoes (steel toe or equivalent when working around heavy equipment)
- Safety glasses or goggles
- Hard hat (if necessary)
- Leather gloves (inner disposable nitrile gloves if handling raw explosives)
- Hearing protection (if necessary)

5.2 LEVEL OF PPE FOR SITE ACTIVITIES

5.2.1 Table 7 of Annex 1, summarizes the PPE for each level of protection identified for site activities.

CHAPTER 6
MEDICAL SURVEILLANCE

6.1 All personnel on site will have successfully completed a pre-placement or periodic (annual) physical examination. This will comply with the requirements of 29 CFR 1910.120, OSHA's regulation regarding Hazardous Waste Operations.

6.2 Documentation of medical examinations is maintained at the HFA, Inc., Waldorf, Maryland office. The documentation will be complete, accurate and be kept on file for 30 years after termination of employment. A minimum of the following information will be kept: (1) name and social security number; (2) physician name, written opinions, recommendations, limitations, and test results; and (3) employee medical complaints related to hazardous waste operations. Copies of the Physician's Statement will be maintained at HFA's Command Post for all on-site personnel.

6.3 MEDICAL EXAMINATION

6.3.1 Tests that are normally performed for employment physical include the following:

- Medical and occupational history on past gastrointestinal, hematologic, renal cardiovascular, reproductive, immunological and neurologic problems, as well as information and history of respiratory disease and personal smoking habits.
- Blood pressure measurements
- Complete blood count and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology.
- Blood urea nitrogen and serum creatinine
- Urinalysis (dipstick and microscopic examination)
- Audiometric examination
- Pulmonary function test ($^{FEV}_{1.0}$ and FVC)
- SMAC-24 or equivalent liver function test
- EKG for employees over 45 years old or when other complications indicate the necessity
- Drug and alcohol screen
- Slit lamp examination (if required)

6.3.2 Table 8 of Annex 1, shows the employees' participation in the medical surveillance program. It includes the employees' name, date of last examination, and name of reviewing occupational physician.

6.4 DRUG/ALCOHOL ABUSE PREVENTION

6.4.1 Substance abuse will not be tolerated. HFA has a comprehensive Drug and Alcohol Abuse Policy and Program. All employees are screened for drugs during initial and annual physical. All employees are required to read and acknowledge receipt of a copy of the HFA Drug and Alcohol Policy. Personnel exhibiting irregular or unusual actions will not be permitted on the work site. Personnel identified as substance abusers will be dismissed.

CHAPTER 7
EXPOSURE MONITORING/AIR SAMPLING PROGRAM

7.1 EXPOSURE MONITORING

7.1.1 The findings, based on the previous sampling actions, indicates that there will be no toxic, radioactive, and flammable atmospheres; therefore, no exposure monitoring will be performed in accordance with ER 385-1-92 and 29 CFR 1910.120. However, personnel will be alert for any indicators of potential exposure to hazardous substances such as dead animals or vegetation, pools of liquids, oils on liquid surfaces, containers, and possible landfill areas.

7.1.2 Site personnel will observe themselves and their team members for signs and symptoms of exposure to explosives, and screening smoke (see in Table 3 of Annex 1).

7.2 SITE-SPECIFIC MONITORING PLAN (SSMP)

7.2.1 Monitoring Instruments to be Used Onsite

7.2.1.0.1 Table 9 of Annex 1 lists the monitoring instruments selected for use on this site and will be used during operations in work zones and breathing zones.

7.2.1.1 Monitoring Schedule

7.2.1.1.1 Table 10 of Annex 1 outlines the minimum schedule for monitoring the anticipated chemical hazards, and defines the action levels and the action to be taken for each anticipated hazard. This table represents the minimum monitoring requirements for the site.

7.2.1.2 Air Monitoring

7.2.1.2.1 Air Monitoring will not be accomplished for this project.

7.2.1.3 Noise Monitoring

7.2.1.3.1 The SSO will perform sound level monitoring whenever on-site equipment or machinery creates a high noise exposure potential. The sound level monitoring will be conducted in the hearing zone of the workers to identify those who have an exposure potentially greater than 85 dBA for 8 hr TWA. If this level is reached, the SSO will issue the worker hearing protection devices and perform noise dosimetry to evaluate the worker's 8 hr TWA exposure. This data will be used to ensure that the attenuated protection level is less than 90 dBA.

7.2.1.4 Temperature and Humidity Monitoring

7.2.1.5 Data on the temperature and relative humidity shall be obtained and recorded hourly, at a

minimum; using this information, the heat/cold stress potential will be evaluated. Information will be provided to the SSO and HSM for developing work/rest periods during manual labor.

7.2.1.6 Record Keeping and Exposure Monitoring Records

7.2.1.6.1 The Health and Safety Manager will be responsible for maintaining all required records. To accomplish this, all information regarding the exposure assessment, including copies of field notes and monitoring results, will be forward to the Waldorf office biweekly by the Site Safety Officer.

CHAPTER 8
HEAT AND COLD STRESS MONITORING

8.1 HEAT STRESS MONITORING

8.1.1 For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 75°F, the SSO will conduct Wet Bulb, Globe Temperature (WBGT) monitoring to assist in controlling the potential for site workers experiencing heat related affects.

8.1.2 The SSO will use a real-time direct reading WBGT monitor, and after estimating the work load, use the values expressed in Table 11 of Annex 1, to decide the work/rest schedule to be implemented. The values outlined in this table are designed so that nearly all acclimatized, fully clothed personnel with adequate salt and water intake can function without the body temperature exceeding 100.4°F. If conditions and/or work loads warrant, the SSO may also implement the Oral Temperature (OT), heart rate and weight loss monitoring outlined in paragraphs 8.2, 8.3, and 8.4.

8.2 ORAL TEMPERATURE MONITORING

8.2.1 If deemed necessary by the SSO, oral temperature (OT) monitoring will be conducted. The worker's OT will be taken and recorded prior to initiation of site activities using a clinical thermometer placed under the tongue. The OT must be taken before consumption of cool liquids and will be done at the end of each work period. Whenever the OT exceeds 99.6°F, the work cycle must be shortened by $^1/_3$, without changing the length of the rest period. If a worker's OT exceeds 99.6°F, test the OT again at the end of the rest period, and do not allow the worker to return to work until the OT drops below 99.6°F. If the worker's OT exceeds 100.4°F, the worker will not be allowed to wear semi-or impermeable PPE for the remainder of that workday.

8.3 HEART RATE MONITORING

8.3.1 If deemed necessary by the SSO, heart rate monitoring will be conducted. The baseline heart rate should be recorded to initiation of site activities by measuring the radial pulse for thirty seconds. After each work cycle, the heart rate will be measured by taking the pulse (PR) as early as possible into the resting period. Taking the radial (wrist) pulse rate is the preferred method, however the carotid (neck) pulse rate may be taken if the radial pulse is hard to locate. The PR at the beginning of the rest period should not exceed 110 beats per minute(bpm). If the PR is higher than 110 bpm, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the PR exceeds 110 bpm at the beginning of the next rest period, the work cycle will be shortened by 33%. This procedure is continued until the PR at the beginning of the rest cycle is maintained below 110 bpm.

8.4 BODY WEIGHT LOSS

8.4.1 When site conditions and work requirements have the potential for causing excessive fluid loss, the SSO will monitor the workers' fluid loss by weighing each worker prior to and again at the conclusion of each workday. This is to ensure that proper hydration is being maintained and that total amount of water weight loss throughout the day does not exceed 1.5% of the worker's body weight. Calculation of the water weight loss, and assessing the effectiveness of hydration will be conducted as follows:

8.4.1.1 Subtract the ending weight (W_{ending}) from the daily starting weight (W_{start}) to obtain the weight lost (W_{lost}) for a given work period: (W_{start}) - (W_{ending}) = (W_{lost}).

8.4.1.2 Multiply the starting weight by 1.5% to obtain permissible weight loss (W_{perm}): (W_{start}) x 0.015 = (W_{perm}).

8.4.1.3 Compare (W_{lost}) to the (W_{perm}), if (W_{lost}) is less than or equal to (W_{perm}), then hydration during the measured period has been adequate, but if (W_{lost}) is greater than (W_{perm}), then hydration should be increased during the next work period.

8.5 HEAT STRESS DOCUMENTATION

8.5.1 The SSO will be responsible for recording all heat stress related information. This will include training sessions, WBGT, OT, water loss calculation and physiological monitoring data. The WBGT, OT and/or water loss calculations will be recorded in the Site Safety Log.

8.6 COLD STRESS MONITORING

8.6.1 Two factors influence the development of a cold injury: ambient temperature and wind velocity. Windchill is used to describe the chilling effect of moving air in combination with low temperatures. Table 12 of Annex 1 shows a windchill chart. As a general rule, the greatest incremental gain in windchill occurs when a wind velocity increases from 5 mph to 10 mph. Additionally, water conducts heat 240 times faster than air. Therefore, the body cools dramatically when personal protective equipment is removed and clothing underneath is perspiration-soaked.

8.7 WORK-WARMING REGIMEN

8.7.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) of below -7°C (20°F) heated warming shelters (tents, cabins, rest rooms, etc.) will be made available nearby and the workers encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing will be provided as necessary to prevent workers from returning to work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in

the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of diuretic and circulatory effects.

8.7.2 For work practices at or below -12°C (10°F), the following will apply:

- The worker will be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods must be taken in heated shelters and opportunity for changing into dry clothing will be provided.
- New employees will not be required to work full-time in cold in the first days until they become accustomed to the working conditions and receive the required protective clothing.
- The weight and bulkiness of clothing will be included in estimating the required work performance and weights to be lifted by the worker.
- The work will be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chairs seats will not be used. The worker should be protected from drafts to the greatest extent possible.

8.7.3 The workers will be instructed in safety and health procedures. The training program will include as a minimum instruction in:

- Proper rewarming procedures and appropriate first aid treatment.
- Proper clothing practices.
- Proper eating and drinking habits.
- Recognition of impending frostbite.
- Recognition signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
- Safe work practices.

8.7.4 Special caution will be exercised when working with toxic substances. Cold exposure may require reduced exposure limits.

8.7.5 Eye protection for workers employed out-of-doors in a snow and/or ice-covered terrain will be supplied. Special safety goggles to protect against ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) and blowing ice crystals are required where there is an expanse of snow coverage causing a potential eye exposure hazard.

8.7.6 Workplace monitoring is required as follows:

- Suitable thermometry should be arranged at any workplace where the environmental temperature is below 16°C (60°F) to enable overall compliance with the requirements of the TLV to be maintained.
- Whenever the air temperature at a workplace falls below -1°C (30°F), the dry bulb temperature should be measured and recorded at least every four hours.

- In outdoor work situations, the wind speed should be measured and recorded together with the air temperature whenever the air temperature is below -1°C (30°F).
- The equivalent chill temperature shall be obtained from Table 13 of Annex 1 in all cases where air movement measurements are required, and will be recorded with the other data whenever the equivalent chill temperature is below -7°C (20°F).
- Employees will be excluded from work in cold at -1°C (30°F) or below if they are suffering from disease or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -24°C (-10°F) with wind speeds less than 5 mph, or air temperatures below -18°C (0°F) with wind speeds above 5 mph should be medically certified as suitable for such exposures.
- Trauma sustained in freezing or sub-zero conditions requires special attention, because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues, in addition to providing for first aid treatment.

CHAPTER 9
STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

9.1 GENERAL PRACTICES

9.1.1 The Dolly Sods site contains potential hazards to project personnel. All HFA personnel and subcontractors will be familiar with these hazards, and strictly adhere to the appropriate safety procedures. The potential hazards and the appropriate controls will be presented to project personnel during Daily Safety Meetings.

9.1.2 Only authorized personnel will be permitted in the work area. These authorized individuals must have successfully completed a medical exam and have been properly trained in accordance with 29 CFR 1910.120 and specific health and safety hazards. All visitors will check in with the HFA or client representative.

9.1.3 Personnel will be prohibited from being transported by any other means than those prescribed for movement of personnel. When trucks or other heavy equipment enters or leaves the site, a ground guide will direct the driver.

9.1.4 A fire extinguisher rated at least 10BC will be at the work site. In the event of an emergency, it will be readily available for the team's use.

9.1.5 Smoking will not be permitted on the premises except in the support area or other specified location. Any employee not willing to comply with this or any other SSHP procedures may be subject to disciplinary action.

9.1.6 At least two qualified persons competent in both First Aid techniques and cardiopulmonary resuscitation (CPR) will be part of the project team. A complete first-aid kit will be readily available on site. If a serious injury occurs, the local hospital and ambulance will be summoned to evacuate the injured or ill person.

9.1.7 No electrical equipment will be permitted in areas where a flammable atmosphere may exist. All static ignition sources will be identified and eliminated by the use of bonding and grounding techniques.

9.1.8 Material Safety Data Sheets (MSDS) will be obtained for every chemical product used on site. This information will be made readily available to all employees upon request and stored in a central location. MSDS or applicable information will be available with regard to materials used in the soil collection and drilling process. All containers of any chemical products will be properly labeled to comply with the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200).

9.2 BUDDY SYSTEM

9.2.1 All work being performed at this site will use the "buddy" system. Team members will keep in visual contact with each other at all times. One member will be responsible to ensure the safety of the other team member. Team members will be aware of any slip, trip, fall, and all lifting hazards along with any potential exposure to chemical substances, heat stress, and general hazards within the work areas.

9.3 EXCAVATION AND TRENCH SAFETY

9.3.1 No entry will be made into an excavation unless it can be done safely. Excavations or trenches of four feet or greater in depth are not anticipated. If such excavation are made and must be entered, an Excavation Plan addendum to this plan must be prepared by the Health and Safety Manager. Safe and secure access and egress will be provided. Employees will be protected at all times from cave ins. Employees will be protected from hazardous atmospheres.

9.3.2 Digging the excavation/trench and all work in the excavation/trench will conform to the requirements of 29 CFR 1926 and EM385-1-1.

9.4 FALL PROTECTION

9.4.1 Workers will not approach the edge of unsloped excavations closer than five feet from the edge unless protected from falling in by a standard guard rail or other approved fall protection.

9.5 HAZARD COMMUNICATION

9.5.1 The Hazard Communication Standard is different from other OSHA health rules as it covers all hazardous chemicals. A "downstream flow of information" means that producers of the chemicals have the primary responsibility for generating and disseminating information, while users of chemicals must obtain the information and transmit it to their employees.

9.6 ILLUMINATION

9.6.1 All field activities will be performed in daylight. No sources of intense light (e.g., infrared or ultraviolet) other than natural light are associated with planned activities. If adequate light is not available (e.g., at least five foot candle for general work), field activities will cease until adequate natural light is available.

9.7 SANITATION

9.7.1 All site cleanliness and sanitation requirements will be in accordance with 29 CFR 1910.120(n) and EM 385-1-1.

9.7.2 HFA will maintain appropriate project on-site housekeeping practices during the course of the UXO services project. All waste generated by HFA will be collected and properly disposed of.

9.7.3 Portable toilet facilities will be provided and located as conveniently to the site as possible.

9.7.4 Potable water, soap, and towels will be brought to the site each day for drinking and washing hands/face. All personnel will wash hands and face prior to eating or drinking, and at the end of the work day.

9.8 UNEXPLODED ORDNANCE SAFETY PRECAUTIONS AND RULES

9.8.1 The following safety precautions and rules will be observed by all non UXO personnel present on a UXO survey site:

- Do not go souvenir hunting.
- Do not pick up or disturb unidentified items.
- Report all UXOs or unidentified objects.
- Do not enter the uncleared area of the site.
- Do not carry fire or spark producing devices into the site.
- Do not smoke except in areas specifically designated for smoking.
- Avoid inhalation and skin contact with explosives.
- Remove from the area any person showing evidence of explosive poisoning or dermatitis.
- Do not allow one person to work alone during any operations.
- Prohibit unnecessary personnel from visiting the operations site.
- Suspend all operations immediately upon approach of an electrical storm.
- Do not attempt to extinguish burning explosives or any fire which might involve explosive materials.
- If explosive materials are burning or their ignition is imminent, immediately evacuate the area.
- Have a vehicle in the area in case of an accident or emergency.
- Have communications equipment in the area in case of an accident or emergency.
- Any work involving electrical tools or equipment will be conducted using ground fault circuit interrupters, to protect workers from electrocution.
- If clothing becomes contaminated, remove immediately.

9.9 ADVERSE WEATHER CONDITIONS

9.9.1 In the event of adverse weather conditions, the SSO will determine if operations can continue without the potential for injury to personnel. Conditions that may cause concern, as well as assist in the determination of whether or not to continue field operations, include, but are not limited to, the following:

- Potential for heat or cold stress
- Severe thunderstorms
- Tornados
- Hailstorms
- Poor visibility

9.9.2 If it is determined prior to departing to the work site that no work can be accomplished that

day, the SUXOS will call each UXO team's supervisor and have the UXO Supervisor call or pass the word to his UXO team. The SUXOS will be notified when all team members have been made aware of the situation by each team UXO Supervisor.

CHAPTER 10
SITE CONTROL MEASURES

10.1 AUTHORIZATION TO ENTER

10.1.1 Access to contaminated work areas is regulated and limited to authorized personnel. Only those who have completed the required training and medical requirements will be allowed to enter. Representatives from regulatory agencies will be permitted to enter the site at any time during business hours or at other reasonable times, provided they have completed the required training and medical requirements. Representatives of the news media and other visitors must receive authorization from the client and the Project Manager before entering.

10.2 HAZARD BRIEFING

10.2.1 The SSO will brief this SSHP to all personnel, including subcontractors entering the site to inform them of the potential site hazards. All personnel will acknowledge this briefing by signing the SSHP.

10.3 DOCUMENTATION OF CERTIFICATES

10.3.1 Personnel entering the site to work will have satisfied the medical and training requirements of 29 CFR 1910.120. The project file will contain copies of certificates documenting status for all on-site personnel. All subcontractors must present documentation of current training and medical status before being granted access.

10.4 SITE SPECIFIC CONTROL PLAN

10.4.1 The goal of the Site Specific Control Plan (SSCP) is to outline the site requirements needed to protect on-site personnel, the environment and the general public from task hazards and exposures to OE. One of the most effective methods for reducing or eliminating the potential for personnel exposure to OE is through the use and enforcement of site control zones and access control points.

10.4.2 The boundaries and access control points for each site will be clearly identified with signs and segregated with ways to prevent accidental intrusion by personnel who are not authorized to be in the area during site operations. It will be the SSO's responsibility to ensure that the control zones and access points are created and then evaluated daily, in such a manner as to ensure that hazards found inside the sites do not migrate outside the sites.

10.5 EXCLUSION ZONES (EZ)/FRAGMENTATION DISTANCE

10.5.1 The EZ is a work area where the greatest hazard potential for exposure to safety and health hazards may exists. All personnel entering the EZ must wear the prescribed level of PPE. Entry and exit points will be established at the EZ to regulate the flow of personnel and equipment into and out of the sites. At anytime an non-UXO qualified personnel enter the EZ, all intrusive activities will

cease while they are within the EZ/fragmentation distance.

10.6 ENTRY LOGS

10.6.1 The SSO keeps a daily roster of all on-site personnel and records the time of entry into and exit from the site.

10.7 ENTRY REQUIREMENTS

10.7.1 All personnel entering the site will be in the proper PPE for the task at hand.

10.8 EMERGENCY ENTRY AND EXIT

10.8.1 In case of emergency, personnel will exit the site and travel to the designated place of refuge. The refuge will be located upwind of the site location. The Project Manager/SUXOS and the SSO will determine the severity of the emergency. If the emergency warrants site evacuation, the SUXOS will do so. The place of refuge will be determined daily by the SSO and provided to the work crews during each morning's safety briefing.

10.9 TRAFFIC CONTROL

10.9.1 The work at the site may at times impede local traffic and inconvenience the local population, or persons visiting the Dolly Sods Wilderness Area. Traffic control will be required during demolition operations and work will be halted if a vehicle passes the site or an unauthorized person enters the site. The Forest Service will coordinate traffic control, for demolition operations in close proximately to public roads.

10.9.2 Emergency routes will be established by law enforcement and fire protection personnel as they are needed. All emergency contact will be via radio or cellular telephone, telephone numbers are provided in Table 14 of Annex 1. The SUXOS will act as the project coordinator and he will coordinate with emergency services providers.

10.10 COMMUNICATIONS

10.10.1 Cellular telephones will be the primary/emergency and the routine method of communication with off site agencies.

10.10.2 Portable radios will be used as site communications between site supervisory personnel and UXO Supervisors. Radios will also serve as the secondary emergency link between field personnel and the headquarters facilities.

10.10.3 All communications will be tested at least once daily, normally in the morning after the daily safety briefing. It is anticipated the routine daily communications will suffice to indicate each unit is operating. This does not preclude supervisors from asking for radio checks if they feel their equipment may not be operating as expected.

10.10.4 If at anytime there is a breakdown of radio and cellular phone communications, operations will cease in that sector until the situation is corrected.

10.10.5 Table 10 of Annex 1 list the primary and secondary means of communication.

CHAPTER 11
PERSONAL HYGIENE AND DECONTAMINATION

11.1 SANITARY FACILITIES

11.1.1 HFA will provide and maintain portable sanitary facilities with at least one unit for each 15 workers. Each temporary toilet will be naturally lighted, have ventilation, lockable from the inside, and be serviced weekly.

11.2 WASHING FACILITIES

11.2.1 HFA will provide washing facilities, convenient to the work area, including portable washing water and soap. All washing facilities will be supplied with liquid soap, paper towels, and trash receptacles. All washing facilities or areas will be kept clean and free of trash.

11.2.2 All field personnel will wash their hands and face prior to eating, drinking, and leaving the site for the day.

11.3 PERSONNEL DECONTAMINATION

11.3.1 Effective decontamination is not simply removing contamination, it begins with preventing contamination. Personal protective equipment prevents the wearer from becoming contaminated, and good work practices reduce contamination of protective clothing and equipment. Some basic examples of effective contamination prevention are:

- Adhering to work practices that minimize contact with hazardous substances; and
- Using remote sampling techniques.

11.3.2 Even with these safeguards, contamination may occur. Since planned activities will be performed in Level D, only Level D decontamination procedures will be discussed.

11.3.3 Level D personnel decontamination consists of following step:

- Wash hands and face with soap and water.

11.3.4 Equipment required for decontamination of personnel and personal protective equipment (PPE) includes:

- collection containers, such as plastic bags for storing discarded paper towels;
- soap and water; and
- paper or cloth towels for drying hands and face.

11.4 WASTE CONTROL AND DISPOSAL

11.4.1 Solid trash, paper towels, and items used in the work zones, are to be classified as industrial solid waste and will be containerized and disposed of as such.

CHAPTER 12
EQUIPMENT DECONTAMINATION

12.1 No equipment decontamination is required for this project.

12.2 All rental heavy equipment and vehicles must be washed free of dirt, when excessively dirty and at the completion of the project. The Site Safety Officer will verify that equipment and vehicles leaving the site is washed according to the following procedures:

12.2.1 VEHICLES

12.2.1.1 Prior to removal from the site, thoroughly wash the vehicles with non-phosphate detergent and rinse with water.

CHAPTER 13
EMERGENCY EQUIPMENT & FIRST AID REQUIREMENTS

13.1 EMERGENCY EQUIPMENT

13.1.1 The emergency equipment listed in Table 13 of Annex 1 will be on-site, stored in the location indicated, and available for use during site operations. Emergency equipment will be maintained and inspected weekly by the SSO or designed to ensure completeness and proper working condition. The selection of emergency equipment to be kept at the site is specific to the hazards and risks associated with the site and the tasks to be performed. For ordnance, ammunition, and explosives removal action, the following on-site emergency equipment will be maintained by HFA:

13.2 FIRST AID REQUIREMENTS

13.2.1 At least two employees current in First Aid and CPR will be assigned to the project and will be on site when HFA employees are working. CPR certification must be refreshed annually. First Aid must be renewed every three years.

13.3 SPILL CONTROL

13.3.1 Spill control is required for materials (e.g., gasoline and engine oil). Materials such as gasoline and engine oil will be stored in small amounts. Gasoline will be stored in OSHA approved safety cans. When materials are being transported in field vehicles (pickups), they will be secured to reduce the potential for a spill.

13.3.2 SPILL CONTROL EQUIPMENT

13.3.2.1 Spill response equipment for cleanup of small scale releases will include:

- absorbent material; and
- containers to put the absorbent into.

CHAPTER 14
EMERGENCY RESPONSE & CONTINGENCY PROCEDURES

14.1 GENERAL

14.1.1 Emergencies must be dealt with in a manner to minimize the health and safety risk to all site personnel. Work activities will be conducted in groups of at least two workers (buddy system) to provide continuous signal monitoring in the event of an emergency. Site emergency phone numbers and the hospital route will be posted in the site command post and placed in each vehicle on-site leased or owned by HFA.

14.1.2 All emergency response agencies and the hospital were notified of potential site hazards and the type of work to be completed by HFA at the initial site visit.

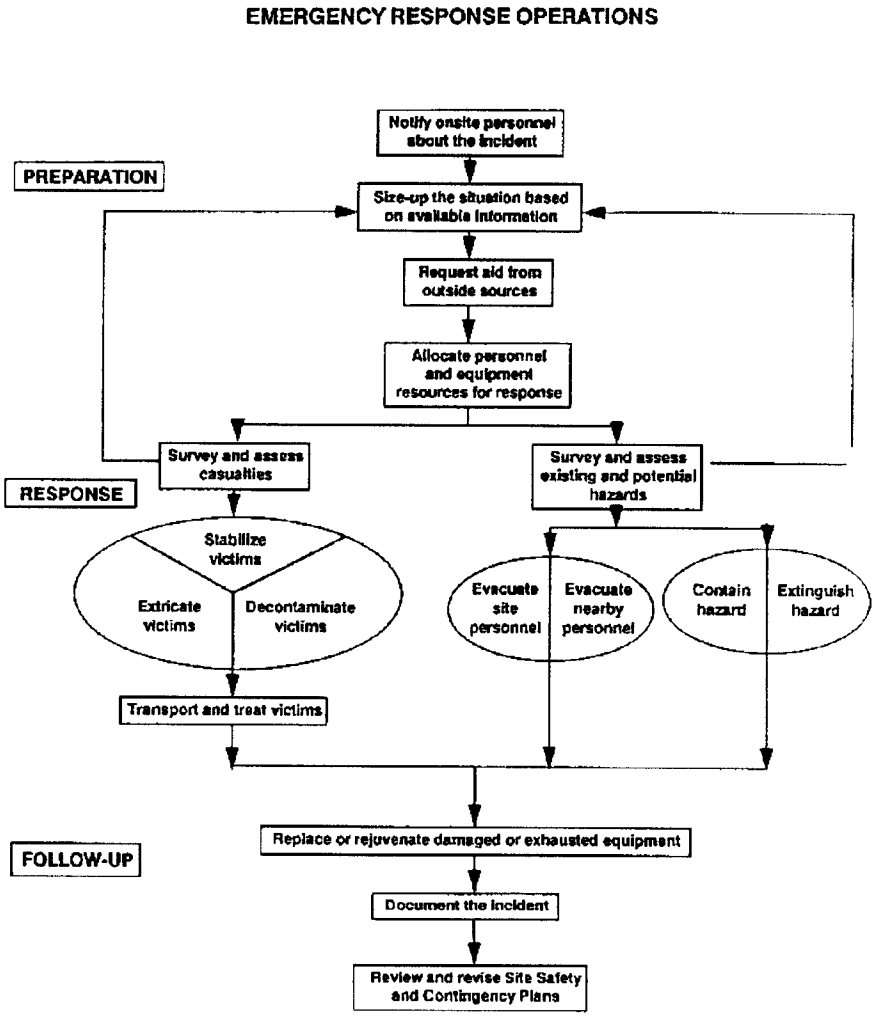
14.1.3 If a UXO cannot be detonated or a suspected chemical munition is encountered, the on-site CEHNC Safety Specialist will be notified, who in turn will notify the nearest EOD/TEU unit, as appropriate, for support. If the CEHNC Safety Specialist is not available, the SUXOS will immediately notify CEHNC Safety.

14.2 PRE-EMERGENCY PLANNING AND PROCEDURES

14.2.1 In the event of an emergency situation, such as fire, explosion, or significant release of a hazardous substance, an air horn or vehicle horn will be sounded three times with five second intervals between blasts to signal the initiation of evacuation procedures. All personnel will evacuate the site and assemble at an upwind safe haven. **The safe haven will be established daily during the tailgate safety briefings**. The SUXOS will initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO will ensure that access for emergency equipment is provided and that all sources of combustion have been shut down once the alarm has been sounded. Once the safety of all personnel has been established, emergency contacts will be notified. Table 14 of Annex 1 lists emergency contacts, and Figure 14-1 delineates basic emergency response procedures. Evacuation procedures will be discussed regularly with all personnel.

EMERGENCY RESPONSE OPERATIONS

FIGURE 14-1



14.3 EMERGENCY RESPONSE PROTOCOL

14.3.1 The Project Manager **(if on-site)** or SUXOS **(if the PM is not on-site)** will have the responsibility for directing the response activity in the event of an emergency. The responsibilities are described below:

Note: If the Project Manager or SUXOS is the individual who is injured, the next senior person will take charge in the following order (SSO, QC Specialist, UXO Supervisors).

14.3.2 Assessing the Emergency

14.3.2.1 Available information related to the emergency, onsite capabilities should be evaluated, and the information listed below should be obtained possible:

14.3.2.1.1 What happened:

- Type of incident;
- Cause of incident;
- Extent of chemical release, include extent and route of migration; and
- Extent of damage to structures, equipment and terrain.

14.3.2.1.2 Casualties involved:

- Victims (number, location and condition);
- Treatment required; and
- Missing personnel.

14.3.2.1.3 What could happen from this point; consider:

- Types of chemicals onsite;
- Potential for fire or explosion, coupled with the release of hazardous materials;
- Location of all personnel in relation to hazardous areas; and
- Potential for emergency affecting the general public or the environment.

14.3.2.1.4 What can be done to remediate the situation; consider:

- Equipment and personnel needed for rescue and hazard migration;
- Number of uninjured personnel available for response;
- Resources available onsite;
- Resources available from offsite response groups and agencies;
- Time needed for offsite response groups to reach the site; and
- Hazards involved in rescue and response.

14.3.2.2 While assessing the emergency situation, notify appropriate emergency personnel and the CEHNC Safety Specialist.

14.3.2.3 Determine and coordinate the on-site personnel actions for the particular emergency situation.

14.3.2.4 Contact and coordinate with appropriate client representative(s).

14.3.2.5 Immediately start a incident/accident log.

14.3.2.6 Immediately contact HFA's Health and Safety Manager @ 301-705-5044.

14.4 RESCUE AND RESPONSE ACTIONS

14.4.1 Based on the information collected during the emergency assessment, the general actions listed below will be taken, with some actions being conducted concurrently. No one attempt emergency response/rescue until the situation has been assessed and the appropriate response outlined by the SUXOS or SSO.

14.4.1.1 Enforce the Buddy System:

- Allow no one enter a contaminated area without a partner.
- Personnel in the EZ should be in line-of-sight or in communication with SUXOS/SSO.

14.4.1.2 Survey casualties:

- Locate all victims and assess their condition.
- Determine resources needed for stabilization and transport.

14.4.1.3 Assess Existing and Potential Hazards and Determine:

- Whether and how to respond.
- The need for evacuation of site personnel and offsite population.
- The resources needed for evacuation and response.

14.4.1.4 Request Aid:

- Contact the required off and onsite personnel or facilities, such as ambulance, fire department, police, COR, etc..

14.4.1.5 Allocate Resources:

- Allocate onsite personnel and equipment to rescue and initiate incident response operations.

14.4.1.6 Control:

- Assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency.

14.4.1.7 Assign PPE:

- In the event of a suspected chemical release, emergency/rescue PPE is required. This will be accomplished by the responding local HazMat personnel.

14.4.1.8 Extricate:

- Remove or assist victims from the area.

14.4.1.9 Decontaminate:

- Use established procedures to decontaminate uninjured personnel in the decontamination area.
- If the emergency makes the PDS area unsafe, establish a new area at the appropriate distance.
- Decontaminate victims before or after stabilization as their medical condition indicates.
- If the victims can not be decontaminated, place on a tarp or plastic sheets to allow handling of the victim without the threat of contaminating support personnel.

14.4.1.10 Stabilize:

- Administer any medical procedures that are necessary before the victims can be transported.
- Stabilize or permanently fix the hazardous condition.
- Attend to what caused the emergency and anything damaged or endangered by the emergency.

14.4.1.11 Transport:

- No one will be transported without being decontaminated, unless injuries are life-threatening.
- Take measures to minimize contamination of the transport vehicles.

14.4.1.12 Casualty Logging:

- Record who, time, destination and condition upon transport.

14.4.1.13 Evacuate:

- Move site personnel to a safe distance upwind of the incident.
- Monitor the incident for significant changes; hazards that may have diminished, permitting personnel to reenter the site, or hazards may have increased and require public evacuation.

14.4.1.14 Casualty Tracking:

- Record disposition, condition and location.

14.5 FIRE PROTECTION AND EMERGENCY SERVICE

14.5.1 Fire protection and emergency services can be obtained from the Forest Fire Department @ (803) 582-3533 and emergency medical services by dialing (304) 637-3337 or dialing 911.

14.5.2 Anytime emergency services are requested of any agency, the caller will stay on the line and provide information and directions to the responding emergency personnel; the emergency service personnel will inform the caller when to hang up.

14.6 FIRST AID NOTIFICATION PROCEDURES

14.6.1 If onsite HFA personnel or offsite emergency personnel are to enter the site in response to the emergency. The SUXOS or SSO will to the extent possible, notify the response personnel about the nature of the emergency, to include:

14.6.1.1 What happened and when it happened.

14.6.1.2 Where onsite the emergency situation occurred.

14.6.1.3 Who is involved and, if possible, the cause of the emergency.

14.6.1.4 The extent of damage and what hazards may be involved.

14.6.1.5 What actions should be taken.

14.6.2 Each team will be equipped with a first aid kit, and one portable eyewash per active work site.

14.6.3 First aid will be rendered for minor injuries on site. The SSO will determine if the injury requires further treatment. If emergency treatment is required, the injured person will be transported to an emergency evacuation point, (determined daily) for further transport the Hospital. If further treated is required, but determined to be routine, or of a non emergency nature the injured person will be transported to the Davis Memorial Hospital via company vehicle for treatment. (see Emergency Medical Route, attached)

14.6.4 Requests for transportation of injured personnel via Emergency Medical Services (EMS) will be coordinated with the Davis Memorial Hospital Emergency Services at (304) 637-3337. EMS personnel will take the injured person(s) to the hospital and start the immediate treatment required.

14.6.5 Once the injured person(s) arrives at the hospital emergency room (ER), ER personnel will determine how severe the injury is and decide if the injured person(s) need MedEvac "Life Flight" transportation to another hospital. This will all be coordinated through Hospital.

14.7 FIRE/UNPLANNED EXPLOSION

14.7.1 In the event of a fire and/or unplanned detonation, the SUXOS will be notified immediately.

14.7.2 Fires will always be reported no matter how small. Site personnel will attempt to contain the fire until the fire fighters arrive. If the fire gets out of hand, involves burning explosives, or is beyond the capabilities of HFA personnel, they will withdraw immediately until help arrives.

14.7.3 All personnel will evacuate the site and proceed to a rally spot determined at the beginning of the day by the SUXOS. He will determine the rally spot based on the wind conditions, the location of the work groups, and the ease and safety of reaching the rally spot.

14.7.4 Upon receiving directions by the UXO Supervisor, all persons will proceed immediately to the designated rally spot. The senior person present will muster and account for all persons and report to the PM or SUXOS.

14.7.5 The SUXOS will standby to receive any additional instructions from the fire fighters and to assist as requested.

14.8 AIRBORNE RELEASE OF HTRW CHEMICALS

14.8.1 If an airborne release of HTRW contaminants occurs, personnel immediately move upwind and evacuate the area. The UXOS will notify the SUXOS and SSO of the release, who will in turn notify the Forest Service Representative, and then follow the applicable procedures from paragraph 14.4. After exiting the area, personnel will proceed to the designated assembly point and report to the SSO. Personnel will be monitored for unusual signs or symptoms while waiting for HazMat and medical personnel. HFA personnel will assist with the evacuation and security of the site as requested, or required.

14.9 FIRST AID AND CPR

14.9.1 Minor cuts, abrasions, or other minor injuries deemed by the HFA SUXOS or SSO to be treatable on-site by first aid, will be treated using the site first aid kit.

14.9.2 If any CPR or first aid is required to be performed by HFA employees, all such employees will do so while observing "universal precautions" and assume that all blood and saliva are infected with the Hepatitis B and Human Immunodeficiency Viruses. HFA employees responsible for performing such services have been trained in CPR and first aid, the hazards of HIV/HBV, and have received the Hepatitis B vaccination consistent with the requirements of 29 CFR 1910.1030(g)(2) "Bloodborne Pathogens." Any employee who sustains exposure to his blood or mucus membranes (eyes, nose, mouth) by blood or blood containing body fluid of another person while performing CPR or first aid will be immediately evaluated by a physician.

14.10 MEDICAL EMERGENCIES

14.10.1 The types of emergencies outlined below are not all inclusive and the corresponding response procedures will not be considered inflexible. Each accident presents a unique event that must be dealt with by key trained personnel. The prime considerations are to provide the appropriate initial response to assist those in jeopardy without placing other personnel at unnecessary risk.

14.10.2 If a person working in an area is physically injured, First Aid procedures will be followed. Depending upon the severity of the injury or illness, emergency medical response may be obtained accordingly. If the person can be moved, that person will be taken to a location from the work area where emergency first aid treatment can be administered. The local emergency medical facility should be contacted along with an ambulance.

14.10.3 The UXO Supervisor will prepare a written report detailing the particular accident, its causes, and consequences within 24 hours of the accident.

14.11 DECONTAMINATION

14.11.1 Life saving care should be instituted immediately without waiting for decontamination (if required) of the injured employee. The injured person's garments may be removed if this does not cause delays, interfere with treatment, or irritate the problem. If garments can not be safely removed, the individual should be wrapped in plastic, rubber, or blankets to minimize contamination of medical personnel and facilities. No attempt to wash or rinse the victim should be attempted unless it is known that he has been contaminated with an extremely corrosive or toxic material which could cause injury or loss of life.

14.11.2 When the site personnel are injured (non-life threatening) or overcome by illness, the following procedures will be followed:

14.11.2.1 Upon notification of the incident, the SUXOS/SSO, if necessary, summon the EMS personnel, if they are not already onsite;

14.11.2.2 Other site personnel will transport the injured/ill victim to the PDS using the stretcher;

14.11.2.3 The SSO or EMS personnel will assess the severity of the injury/illness, and direct the immediate life support if required;

14.11.2.4 If immediate life support is not required, or the victim is stabilized, and if contact with hazardous materials are suspect, decontamination of the victim with soapy water and clean water rinse will occur;

14.11.2.5 Site personnel will remove the victims clothing, exercising care not to aggravate the injury;

14.11.2.6 The victim will be transferred to the evacuation point, or EMS personnel;

14.11.2.7 EMS personnel will, determine the extent of injuries, and, transport victim to the medical facility for further attention.

14.12 POST EMERGENCY FOLLOW-UP

14.12.1 Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. Restock and clean all equipment and supplies utilized or damaged in the emergency.

14.13 DOCUMENTATION

14.13.1 Documentation related to the emergency will be recorded in an accurate, authentic, and

complete fashion. Documentation will be recorded as soon as possible after the emergency to ensure it is recorded while the events are vivid in the minds of the personnel involved. The information recorded will included:

14.13.1.1 A chronological record of events;

14.13.1.2 A list of the personnel involved, including personnel onsite, site personnel who responded, personnel in charge, and offsite groups that responded;

14.13.1.3 A list of the actions taken to minimize the effects or mitigate the emergency;

14.13.1.4 An assessment of the potential exposures received by site personnel and the surrounding public; and

14.13.1.5 A record of the injuries or illnesses which occurred as a result of the emergency.

14.14 COMMUNICATION PROCEDURES (INTERNAL AND EXTERNAL)

14.14.1 Internal communication systems alert personnel to danger, convey safety information, and maintain site control. The system will include radio communication, horns, and hand signals. Personnel will be trained in the meaning of each signal, and the signals will be practiced regularly.

14.14.2 External communications will be accomplished using the telephone to obtain assistance or inform emergency contacts. Cellular telephones and/or two-way radios will be available in vehicles when vehicles are occupied by personnel.

14.15 EQUIPMENT

14.15.1 All communication equipment used on site will be intrinsically safe and will be capable of transmitting above background noise. Equipment will include two-way radios, cellular telephones, and at least one of the following:

- an air horn;
- a siren; or
- a whistle.

14.16 SIGNALS

14.16.1 Emergency communication signals will be clear to all personnel. Table 14 of Annex 1 lists signals for different communication devices and situations.

14.17 MAPS

14.17.1 Appendix C, Site Map, shows the location of emergency medical facilities and emergency telephone numbers.

CHAPTER 15
ACCIDENT PREVENTION
LOGS, REPORTS AND RECORDKEEPING

15.1 REPORTING INJURIES AND ILLNESSES

15.1.1 Employees will report all injuries to their supervisor immediately and report illnesses as soon as the employee knows he is sick. Supervisors will have employees showing signs of illnesses or injuries evaluated by a physician immediately and submit completed "Report of Injury" to the H&S Manager within 24 hours of the occurrence. If there is any indication that any illness is work-related, the supervisor will submit a completed "Report of Injury" to the H&S Manager within 24 hours after notification by the employee.

15.1.2 HFA will report all on-duty accidents, injuries, and work related illnesses to the CEHNC Safety Specialist immediately.

15.2 USACE ACCIDENT REPORTING

15.2.1 Accident reporting and Recordkeeping will be accomplished in accordance with AR 385-40 with USACE Supplement, ENG Form 3394, and EM 385-1-1.

15.3 LOGS, REPORTS, AND RECORDKEEPING

15.3.1 The following logs, reports, and records (if required) will be maintained on-site:

- training logs (site-specific and visitors);
- safety inspection logs;
- equipment inspection logs;
- site visitors, entry, and dress out logs; and
- environmental, personal exposure, sampling results, decontamination, and calibration logs.

SAFE FRAGMENTATION/BLAST DISTANCES FOR DOLLY SODS NORTH AREA
TABLE 1

MUNITION	MAXIMUM HORIZONTAL RANGE (ft)*	SAFE BLAST (Over pressure) (ft) **
60mm Mortars	723	213
81mm Mortars	716	377
4.2" Mortar	944	498
57mm Projectile	880	269
105mm Projectile	1,224	429
155mm Projectile	1,699	652

* = Safe fragmentation distance is a hazardous fragment having an impact energy of less than 58 ft-lb (i.e., projected fragmentation are traveling to low a velocity to penetrate bare skin).

** = Safe blast (over pressure) distance was determined using the following formula ($K328W^{\frac{1}{3}}$).

TABLE 2
CONTAMINANT CHARACTERIZATION DATA

CHEMICAL NAME	Media Where Found	Concentration Range	Location Where Found Onsite	Estimated Quantities/Volume
Cyclotrimethylene-trinitramine (RDX)	Soil	Unknown	Where explosives were stored and/or used.	Unknown
1,3-Dinitrobenzene	Soil	Unknown	Where explosives were stored and/or used.	Unknown
Trinitrotoluene (TNT)	Soil	Unknown	Where explosives were stored and/or used.	Unknown
N-methyl-N,2,4,6-tetranitroaniline (TETRYL)	Soil	Unknown	Where explosives were stored and/or used.	Unknown
Pentaerythritol Tetranitrate (PETN)	Soil	Unknown	Where explosives were stored and/or used.	Unknown
2,4-Dinitrotoluene	Soil	Unknown	Where explosives were stored and/or used.	Unknown
2,6-Dinitrotoluene	Soil	Unknown	Where explosives were stored and/or used.	Unknown

TABLE 3
CONTAMINANT SIGNS AND SYMPTOMS

HAZARDOUS SUBSTANCES	EXPOSURE LIMITS (PEL OR TLV)	PHYSICAL DESCRIPTION	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS
Cyclotrimethylene-trinitramine (RDX)	1.5 mg/m^3	White, crystalline, odorless solid	Inhalation, ingestion, and skin absorption	Respiratory tract irritation, unconsciousness, convulsions, headache, dizziness, nausea, and vomiting. Possible irritation to eyes.	Bone marrow and the liver.
1,3-Dinitrobenzene	1.0 mg/m^3	White crystals	Inhalation, ingestion, and skin absorption	Irritant to the respiratory tract, unpleasant taste in mouth, burning or dryness of the throat, headaches, cyanosis, weakness, dizziness, dyspnea, nausea, vomiting, drowsiness, chest pains, staggering gait, and coma. Skin and eye contact may cause a yellow discoloration.	Blood, eyes, liver, and central nervous system.
Trinitrotoluene (TNT)	0.5 mg/m^3	Pale yellow flakes or prills, practically odorless.	Inhalation, ingestion, and skin absorption	Orange staining on exposed skin, nosebleeds, papules (small, solid, usually conical elevation of the skin), severe (redness, itching, and oozing vesicular lesions), headache, dizziness, cyanosis, convulsions, and death. Eye contact may cause redness, pain, excessive discharge of tears, and blurred vision.	Bone marrow and the liver.
N-methyl-N,2,4,6-tetranitroaniline (Tetryl)	1.5 mg/m^3	Colorless to yellow, odorless, crystalline solid.	Inhalation, ingestion, and skin absorption	Respiratory tract irritation, fatigue, headache, weakness or weariness, nausea, vomiting, anemia, liver and kidney damage, bright yellow/orange stain on skin, and skin and eye irritation.	Eyes, skin, respiratory system, CNS, liver, and kidneys.
Pentaerythritol tetranitrate (PETN)	N/A	Colorless to white, crystalline, odorless powder.	Inhalation, ingestion, and skin absorption	Human systemic effects by ingestion. A skin irritant. It can cause respiratory difficulties and death due to respiratory paralysis by ingestion. The acute symptoms are headaches, nausea, vomiting, abdominal cramps, convulsions, circulatory collapse, reduced blood pressure, excitement, vertigo, fainting, respiratory rales(any sound or noises in the lungs that should not be there), and cyanosis. Toxic effects may occur by ingestion, inhalation of dust, or absorption through contact with the skin.	Eyes and respiratory system.
2,4 & 2,6-Dinitrotoluene	1.5 mg/m^3	Orange-yellow crystalline solid with a characteristic odor.	Inhalation, ingestion, and skin absorption	Irritation of the respiratory tract, unpleasant taste in the mouth, burning or dryness of the throat, methemoglobinemia (reduced ability of the blood to carry oxygen) symptoms include: headache, cyanosis of lips, nose, and earlobes, weakness, dizziness, ataxia (lack of muscular coordination due to nervous system disease), dyspnea, nausea, confusion, lethargy, convulsions, and coma. Skin and eye contact may result in thermal burns.	Blood, liver, and CNS.

THRESHOLD LIMIT VALUES FOR NOISE☆
TABLE 4

Duration per Day Hours		Sound Level dBA*
	24	80
	16	82
	8	85
	4	88
	2	91
	1	94
Minutes	30	97
	15	100
	7.50▲	103
	3.75▲	106
	1.88▲	109
	0.94▲	112
Seconds▲	28.12	115
	14.06	118
	7.03	121
	3.52	124
	1.76	127
	0.88	130
	0.44	133
	0.22	136
	0.11	139

☆ No exposure to continuous, intermittent, or impact noise in excess of a peak C-weighted level of 140 dB.

* Sound levels in decibels are measured on a sound level meter, conforming as a minimum to the requirement of the American National Standards Institute Specification for Sound Meters, S1.4 (1983)[(2)] Type S2A, and set to use the A-weighted network with slow meter response.

▲ Limited by the noise source -- not by administrative controls. It is also recommended that a dosimeter or integrating sound level meter be used for sounds above 120 decibels.

TRAINING DATES

TABLE 5

Name	40 Hour	8 Hour Refresher	8 Hour Supervisor	First Aid/CPR	Miscellaneous Training

Table 5 will be completed once the Notice to Proceed has been received.

REASONS TO UPGRADE OR DOWNGRADE LEVEL OF PPE

TABLE 6

UPGRADE	DOWNGRADE
• Request of individual performing task. • Change in work task that will increase contact or potential contact with hazardous materials (i.e., RFNA, UDMH, diesel fuel, etc..). • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazard. • Known or suspected presence of airborne radioactive material.	• New information indicating that situation is less hazardous than originally thought. • Change in site condition that decreases the hazard. • Change in work task that will reduce contact with hazardous material.

PPE CONSIDERATIONS

TABLE 7

TASK	LEVEL	LIMITATIONS
Surveying & Mapping/Site Preparation	D	Contaminant concentrations must be less than actions levels. Oxygen concentration must be at least 19.5%.
Ordnance and Explosive Removal	D	
Turn-in of Recovered Inert Ordnance and Explosive Related Scrap	D	
Quality Control	D	

MEDICAL SURVEILLANCE PROGRAM

TABLE 8

NAME	DATE OF LAST EXAMINATION	REVIEWING OCCUPATIONAL PHYSICIAN

Table 8 will be completed once the Notice to Proceed has been received.

TABLE 9
MONITORING INSTRUMENT USE, CALIBRATION, AND MAINTENANCE

INSTRUMENT	TASKS	CALIBRATION MAINTENANCE	MAINTENANCE
Sound Level Meter	As Required.	IAW Manufactures Instruction.	IAW Manufactures Instruction.

TABLE 10
SITE MONITORING SCHEDULE AND ACTION LEVELS

CONTAMINANT OR HAZARD TO BE DETECTED	MONITORING EQUIPMENT	MONITORING RESPONSIBILITY	MONITORING FREQUENCY	ACTION LEVEL	ACTION TO BE TAKEN
Noise	Sound Level Meter	Site Safety Officer	**At the start of the project the SSO will perform noise monitoring on all piece of heavy and power equipment.**	85 dBA	Hearing Protection.

Permissible WBGT Heat Exposure Threshold Limit Values[a]
[Values are given in °F and (°C)]
TABLE 11

WORK/REST REGIMEN	WORK LOAD		
	LIGHT*	Moderate*	Heavy*
Continuous work	86 (30.0)	80 (26.7)	77 (25.0)
75% Work - 25% Rest, each hour	87 (30.6)	82 (28.0)	78 (25.9)
50% Work - 50% Rest, each hour	89 (31.4)	85 (29.4)	82 (27.9)
25% Work - 75% Rest, each hour	90 (32.2)	88 (31.1)	86 (30.0)

* *Consult the ACGIH TLV booklet for definitions of Light, Moderate and Heavy work loads. Values are given in °F and (°C) WBGT, and are intended for personnel wearing single layer summer type clothing. As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized personnel performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.*

a *Source: American Conference of Governmental Industrial Hygienist (ACGIH). 1995 - 1996 Threshold Limit Values and Biological Exposure Indices. Cincinnati, OH.*

TABLE 12
COOLING POWER OF WIND ON EXPOSED FLESH AS EQUIVALENT TEMPERATURE

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	--24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40mph have little additional effects)	**LITTLE DANGER** In <hr with dry skin, maximum danger of false sense of security				**INCREASING DANGER** Danger from freezing of exposed flesh within one minute				**GREAT DANGER** Flesh may freeze within 30 seconds			

(a) Developed by U.S. Army Research Institute of Environmental Medicine, Natick, Massachusetts.

NOTE: Trenchfoot and immersion foot may occur at any point on this chart.

TABLE 13
THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT[a]

AIR TEMPERATURE-SUNNY SKY		NO NOTICEABLE WIND		5 MPH WIND		10 MPH WIND		15 MPH WIND		20 MPH WIND	
°C (approx.)	°F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26 to -28	-15 to -19	(NB)	1	(NB)	1	75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	(NB)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease							
-43 and below	-45 and below	Non-emergency work should cease									

(a) Adopted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

NOTE:
1. Schedule applies to any 4 - hour work period with moderate to heavy work activities, with warm-up periods in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour period in a warm location. For light-to-moderate work (limited physical movement), apply the schedule one step lower. For example, at -35°C (-30°F) with no noticeable wind, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period.
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph - light flag moves; 10 mph - light flag fully extended; 15 mph - raises newspaper sheets; 20 mph - blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given would be: (1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1,750 W/m^2*; all non-emergency work should have ceased at or before a wind chill of 2,250 W/m^2. In general, the warm-up schedule provided above slightly under-compensates for the wind at warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in colder ranges because windy conditions rarely prevail at extremely low temperatures.
4. Threshold Limit Values apply for workers in dry clothing.

* Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.

EMERGENCY CONTACTS
TABLE 14

ORGANIZATION	CONTACT NAME & PHONE NUMBER
ONSITE	
Police Department (State Police)	304-637-0200 or 911
Fire Department (Forest Service District Ranger)	304-257-4488 or 911
Medical Facility (Davis Memorial Hospital)	304-637-3337
Emergency Medical Services	304-257-1212 or 911
Forest Service representative	On-site
HFA, Inc.	
Project Manager (Floyd Kittle)	301-705-5044
Health and Safety Manager (Michael L. Winningham)	301-705-5044
EOD/TEU	
48th Ord Det., Fort Jackson, SC	803-751-1562
TEU (APG Edgewood Area)	410-671-2773
USACE	
Project Manager (David Shafii)	205-895-1443
CEHNC Explosive Safety Management Group	205-895-1587/1580
Other	
CHEMTREC	800-424-9300
Explosives Division (Department of the Treasury)	202-927-7920

COMMUNICATION PRIORITIES

TABLE 15

LOCATION	PRIMARY	SECONDARY
On-site	Voice or hand-held radios	Hand signals or air horn
On-site to Headquarters	Radios	Cellular phone
Headquarters to off-site	Radios	Cellular Phone

EMERGENCY EQUIPMENT REQUIREMENTS

TABLE 16

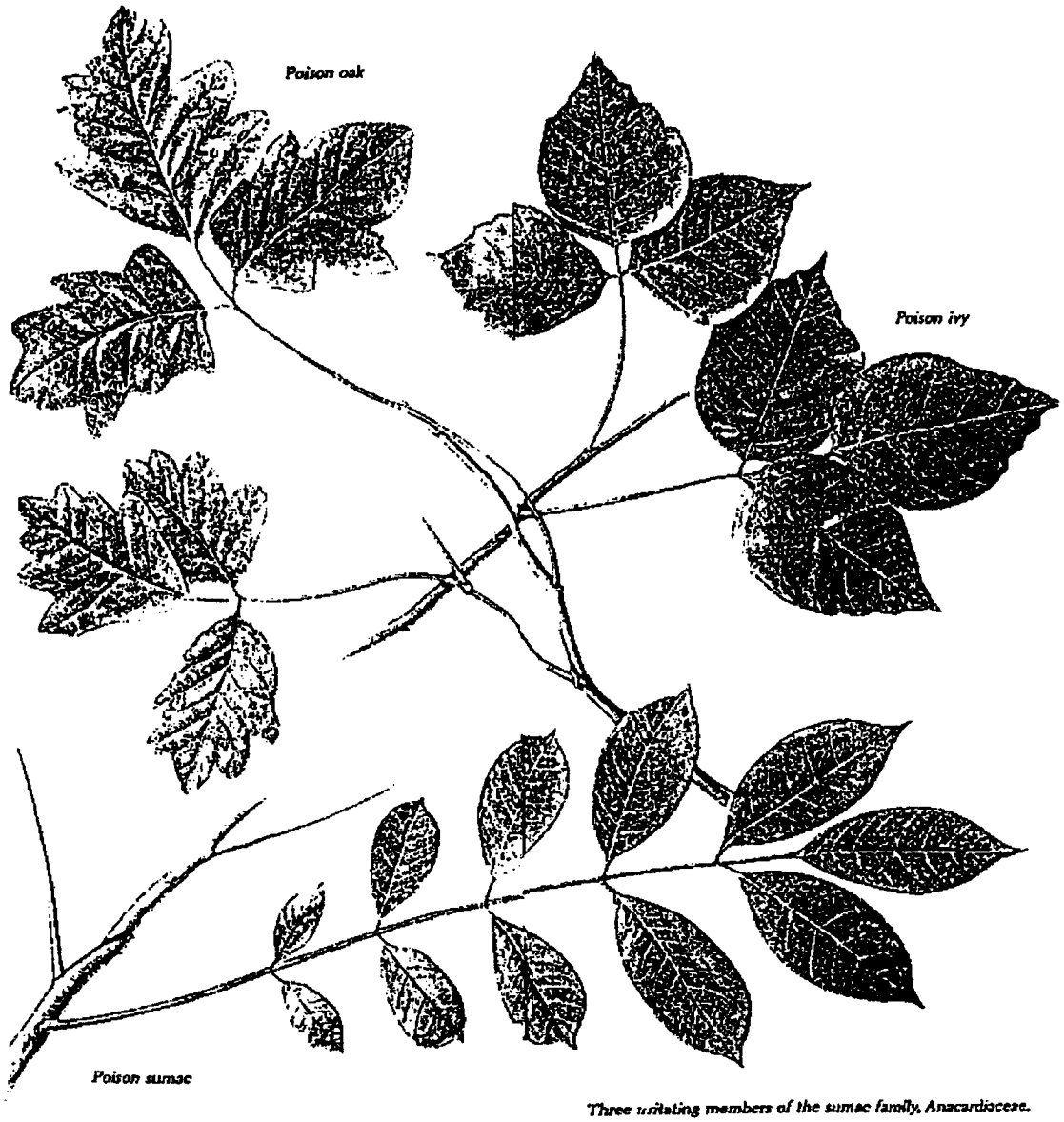
Emergency Equipment	Locations where Emergency Equipment is to be Stored	Operation where Emergency Equipment is Required
standard industrial first aid kit	Each Team Vehicle, SSO Vehicle, and SZ	All Operations
burn kit/blanket	SSO Vehicle and SZ	
fire extinguisher, rated at least 1A, 10BC	Each Team Vehicle, SSO Vehicle, and SZ	
portable stretcher	SSO Vehicle and SZ	
15 minute eyewash	SZ	
CPR masks/shield (one way breathing barriers)	Each Team Vehicle, SSO Vehicle, and SZ	
air horn	Each Team Vehicle, SSO Vehicle, and SZ	
portable eyewash kit	Each Team Vehicle, SSO Vehicle, and SZ	

EMERGENCY COMMUNICATION SIGNALS

TABLE 17

DEVICE	SIGNAL
Radio	Established Code Words
Air Horn/Bell/Siren/Whistle	One long blast (repeated three times with 5 seconds intervals between blasts): Evacuate area by nearest direction
	Two short blast: Localized problem, not dangerous to workers.
	Two long blasts: All clear
Visual signals: Hand and whole body movements	Hand clutching throat: Can't breathe.
	Waving hands over top of head: Need assistance now.
	Thumbs up: OK/I'm all right/I understand.
	Thumbs down: No/Negative.
	Grasp partner's wrist or both hands around partner's waist: Leave area immediately, no questions.
	Pointing to ears: Can not hear or understand.

POISONOUS PLANTS
FIGURE 2 - 1



Three irritating members of the sumac family, Anacardiaceae.

TIMBER RATTLESNAKE
FIGURE 2-2

HAZARD ANALYSIS

ACTIVITY Site Preparation ANALYZED BY/DATE M. Winningham 8/18/97 REVIEWED BY/DATE

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Grubbing and Brush Clearing	Potential UXO	Be alert. Mark and report all UXO located during this task.
Preliminary site inspection		Do not subject UXO to heat, shock, or friction.
	heat stress	Take appropriate weather protection measures
	Wildlife, venomous snakes, insects, biological hazards	Be alert. Watch for snakes, make noise, and do not handle wildlife. Check yourself at end of the day for ticks. Wear light color clothing with cuffs and openings closed.
	slips, trips, falls	Be alert. Watch for trip hazards and look where you walk.
	Wood Chipping	Personnel will wear leather gloves, hard hats, face shields, safety goggles, and hearing protection.
	Cuts and lacerations from using cutting tools and from brush (required PPE level)	Personnel will wear Level D PPE to include the following; leather gloves, hard hats, and eye protection when cutting and clearing brush, personnel using chainsaws or machetes will wear protective kevlar chaps. Hearing protection will be worn when using power equipment. Have water, first aid kits, communication on location.
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Chainsaws, axes, brushhooks, machetes	Check chainsaw for good working conditions, saw bar and chain, fuel and spark arrestor	Inspection criteria; starting procedures; fuel is a flammable and explosive material. Proper safety equipment on site and in use. Personnel read and comply with SSHP

HAZARD ANALYSIS

ACTIVITY OE Sampling/Removal ANALYZED BY/DATE M. Winningham 8/28/97 REVIEWED BY/DATE _____

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Establishing Boundaries and Grids	Potential UXO	Be alert. Mark and report all UXO located during this task. If using an subcontractor provide UXO escort and perform magnetometer check prior to driving stakes into the ground.
	Wildlife, venomous snakes, insects	Be alert. Watch for snakes, make noise, and do not handle wildlife. Check yourself at end of the day for ticks. Wear light color clothing with cuffs and openings closed.
	slips, trips, falls	Be alert. Watch for trip hazards and look where you walk.
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Magnetometers, measuring tapes	IAW manufactures manuals	Brief subcontractor(s) on UXO Hazards.

HAZARD ANALYSIS

ACTIVITY OE Sampling/Removal ANALYZED BY/DATE M. Winningham 8/28/97 REVIEWED BY/DATE

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Marking and Searching Grids Identify OE/UXO	Potential UXO	Follow WP, SSHP, and other standard practices. Stay alert. Wear level "D" PPE, IAW SSHP. Apply CEHNC Safety Concepts and Basic Consideration for UXO Operations.
	Wildlife, snakes, insects	Be alert. Watch for snakes, make noise, and do not handle wildlife. Check yourself at end of the day for ticks. Wear light color clothing with cuffs and openings closed.
	Slips, Trips, Falls	Stay alert. Look for trip hazards.
	heat stress	Take appropriate weather protection measures
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Magnetometers/Metal Detectors	Daily operational checks	Train operators in the use of locating equipment and brief workers in UXO safety.
Hand tools		40 hour hazards waste worker course. Graduate of USN EOD school.
		Site-specific UXO and hazard training. Read and comply with SSHP.

HAZARD ANALYSIS

ACTIVITY OE sampling/Removal ANALYZED BY/DATE M. Winningham 8/28/97 REVIEWED BY/DATE _____

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Removing contacts Identify OE/UXO	Potential UXO Unplanned Detonation Unauthorized personnel in area	Only qualified UXO Specialists will excavate UXO in accordance with the WP/SSHP and CEHNC Basic Concepts and Safety Considerations dated February 1996. Only necessary personnel to perform the excavation will be in the work area. Only hand excavations will be permitted for uncovering OE/UXO. Post warning signs, establish exclusion zones, and stop all unauthorized persons from entry. Use caution when moving around the site
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Shovels, trowels, picks,	Good repair, check daily before use	All UXO Specialists are Graduates of EOD School. Brief personnel on site specifics.
Schonstedt GA-52C/72B		Training in the use of hand tools
		Daily Tailgate Safety meetings

HAZARD ANALYSIS

ACTIVITY Demolition Operations ANALYZED BY/DATE M. Winningham 8/28/97 REVIEWED BY/DATE

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Detonating in place	Unplanned Detonation	Handle in accordance with WP, SSHP, and standard demolition procedures.
Preparing and placing charges	Unplanned Detonation	Handle in accordance with WP, SSHP, and standard demolition procedures.
	Noise	Distance and tamping. Provide hearing protection and monitor noise emission.
	Flying debris	Distance and tamping material. Protection during demolition operations at least the fragmentation distance away from disposal sites.
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Demolition materials and equipment	Good working order	In accordance with EODB/TM/TO 60A-1-1-31 and state laws.
Explosives	Properly stored and in good condition	Handle in accordance with WP, SSHP, and standard practices.
		USNAVSCOLEOD Graduates.

HAZARD ANALYSIS

ACTIVITY Demolition Operations ANALYZED BY/DATE M. Winningham 8/28/97 REVIEWED BY/DATE

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
(Identify the principal steps involved and the sequence of work activities.)	*(Analyze each principal step for its potential hazards.)*	*(Develop specific controls for each potential hazard.)*
Transporting demolition materials to site	Unplanned detonation/vehicle accident or fire	Handle and transport in accordance with WP, SSHP, and standard procedures. Use only qualified drivers. Plan routes and travel times. Inspect vehicle for explosive transportation suitability. Fire extinguisher. Vehicles will be placard. Blasting caps and demolition materials will be in separate containers. Use proper lifting techniques.
Preparing and placing charges	Unplanned detonation	Handle and transport in accordance with WP, SSHP, and standard procedures.
	Noise	Distance and tamping material.
	Flying debris	Distance and tamping material.
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
(List equipment and/or machinery to be used in conducting the work activities.)	*(List inspection requirements for the equipment and/or machinery used.)*	*(Determine requirements for worker training, including hazard communication.)*
Demolition equipment.& materials.	Good working order	In accordance with EODB/TM/TO 60A-1-1-31 and state laws.
Explosives	Properly stored	In accordance with the WP, SSHP, and standard procedures.
		USNAVSCOLEOD Graduates.

HOLSTON ARMY AMMUNITION PLANT

MATERIAL SAFETY DATA SHEET

Manufacturer:
HOLSTON DEFENSE CORPORATION
WEST STONE DRIVE
KINGSPORT, TENNESSEE 37660

Holston
MSDS No. 4825.0072

For more information about this MSDS, dial (615) 247-9111, Ext. 3302

SECTION I

EFFECTIVE DATE: 05/24/86 (Mo./Da./Yr.)

HDC CHEM. No. 505

DOT No. 0072

LABEL NAME: RDX

CHEMICAL NAME: Cyclotrimethylenetrinitramine

TRADE, COMMON NAMES, OTHER: Cyclonite, Hexogen

CHEMICAL FORMULA: $C_3H_6N_6O_6$

MOLECULAR WT.: 222.1

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

CHEMICAL NAMES	COMMON NAME(S)	WEIGHT %	ACGIH TLV (Units)
Cyclotrimethylene-trinitramine	RDX, Hexogen, Cyclonite	92-100	1.5 mg/m^3 TWA (skin) 3.0 mg/m^3 STEL (skin)

SECTION III PHYSICAL DATA

BOILING POINT(^{0}C)	: NA	SPECIFIC GRAVITY(H_2O=1):	1.8
MELTING POINT(^{0}C)	: 205 w/decomp	PERCENT VOLATILE(vol %):	NA
VAPOR PRESSURE(mm Hg):	NA	EVAPORATION RATE :	NA
VAPOR DENSITY(Air=1)	: NA		
SOLUBILITY IN WATER	: insoluble		
APPEARANCE AND ODOR	: white, crystalline, odorless solid		

SECTION IV FIRE AND EXPLOSIVE HAZARD DATA

FLASH POINT (^{0}C): NA
(Method Used) : NA

FLAMMABLE LIMITS (Vol %)
LEL: NA UEL: NA

Water sprinkler/deluge system recommended.

SECTION IX (Continuation)

PRECAUTIONS TO BE TAKEN IN STORAGE AND HANDLING (continued)

cading, personnel exposure and material handling equipment. Recycle or dispose of used containers in accordance with appropriate Safety Agency regulations. In buildings and locations where explosives with spark energies for initiation not greater than 0.02 Joules are handled, the relative humidity should be 50% or greater. Dust generated by handling must be cleaned up on a continuing basis.

OTHER PRECAUTIONS: CAUTION: Explosives must be tested for compatibility with any materials which they contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compound, floor and table coverings, packing materials, and other similar materials and equipment. Keep container closed. Wash thoroughly after handling. Wash contaminated clothing before reuse. Extreme care should be exercised during maintenance of explosive contaminated equipment. Decontamination procedures include washing/steaming, chemical decontamination, and thermal decontamination. Decontamination should be performed prior to welding, cutting or grinding metal parts. Penetrating oil should be used liberally on nuts, bolts, and all threaded connections to aid in desensitizing hidden explosives prior to disassembly. Refer to AMCR 385-100, paragraph 16-16.

SECTION X CONTINUATION

The notation NA is used to indicate that a section or item of information is not applicable for the chemical or ingredient. An asterisk (*) is used to indicate that a section or item of information is applicable but no known information is available.

Additional information about the properties of explosives can be found in the Engineering Design Handbook, Explosives Series, Properties of Explosives of Military Interest, Army Materiel Command Pamphlet 700-177.

Additional information about fire fighting procedures; collection and destruction of waste; and storage and handling precautions can be found in the Army Safety Manual, Army Materiel Command Regulation 385-100 and the Department of Defense Contractors' Safety Manual for Ammunition, Explosives and Related Dangerous Materiel, DD 4145.26M.

RDX is packaged in accordance with Department of Transportation regulations (Tariff No. BOE-6000-E) and contains isopropyl alcohol which serves as an anti-freeze agent. An MSDS for isopropyl alcohol has also been provided with this MSDS for RDX.

SECTION VI HEALTH HAZARD DATA

TOXICOLOGY: The toxicological properties of RDX have not been fully investigated. LD-LO (Based on RDX, lowest published lethal dose) Oral-Rabbit-500 mg/kg; Intraperitonel-Rat-10 mg/kg; Oral-Cat-100 mg/kg; Intravenous-Rat-18 mg/kg; Oral-House 500 mg/kg. LD_{50} Oral-Rat-100 mg/kg; Oral-House-500 mg/kg. OSHA PEL - Not established.

CARCINOGENICITY: Not listed as a carcinogen by the International Agency for Research on Cancer, National Toxicology Program or Occupational Safety and Health Administration.

EFFECTS OF EXPOSURE: SKIN & EYES: Can cause allergic skin reaction. Can cause eye irritation. Avoid prolonged contact with skin. Avoid contact with eyes.

INHALATION AND INGESTION: Chronic exposure to RDX dust has been reported to cause convulsions or unconsciousness. Chronic local and systemic effects are not fully known. Inhalation and ingestion can result in systemic poisoning, usually affecting the bone marrow (blood-cell-producing system) and the liver. Avoid inhalation and ingestion of dust.

EMERGENCY AND FIRST AID PROCEDURES: EYES: In case of contact, flush thoroughly with large amounts of low pressure water for at least 5 min. Remove contact lenses. Get medical attention.

SKIN: Wash with soap and warm running water. Clean clothing thoroughly and dispose of shoes contaminated with explosives in accordance with explosive disposal procedures. Get medical attention for rash or irritation.

INHALATION: Remove to fresh air, treat any irritation symptomatically. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: If conscious, induce vomiting immediately by giving 1 or 2 glasses of water and touching back of throat with finger or blunt object or by giving syrup of ipecac. Never give anything by mouth to an unconscious person. Get medical attention.

SECTION VII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: (specify type) Use NIOSH approved respirator for dusts and particulates if exposed to dusting.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Section 1. Material Identification

Dinitrobenzene ($C_6H_4N_2O_4$) Description: Derived by nitration of nitrobenzene with mixed acid under vigorous conditions. Used in organic synthesis, dyes, explosives (the *ortho* polymer is used in bursting charges and to fill artillery shells), and as a camphor substitute in cellulose nitrate. It is important to know the particular dinitrobenzene isomer you are using since physical properties and toxicities vary.

Other Designations: CAS No. 528-29-0 (*o*-dinitrobenzene), 1,2,dinitrobenzene; CAS No. 99-65-0 (*m*-dinitrobenzene), binitrobenzene, 1,3,dinitrobenzene, 2,4,dinitrobenzene, 1,3,dinitrobenzol; CAS No. 100-25-4 (*p*-dinitrobenzene), 1,4,dinitrobenzene, Dithane A-4.

Manufacturer: Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*[73] for a suppliers list.

Cautions: Dinitrobenzene is a highly shock-sensitive, explosive material. It can cause anemia (lack of red blood cells), cyanosis (bluish-purple skin discoloration due to lack of oxygenated blood), and possibly death.

† NFPA hazard rating is given for the *ortho* isomer.

R	4
I	4
S	4*
K	1

* Skin absorption

NFPA†

HMIS
H 3
F 1
R 4
PPG‡
‡ Sec 8

Section 2. Ingredients and Occupational Exposure Limits

Dinitrobenzene (*ortho*, *meta*, and *para* isomers),* ca 98%

1990 OSHA PEL (Skin)
8-hr TWA: 1.0 mg/m³

1990 IDLH Level
200 mg/m³

1990 NIOSH REL (Skin)
TWA: 1.0 mg/m³

1991-92 ACGIH TLV (Skin)
TWA: 0.15 ppm (1.0 mg/m³)

1990 DFG (Germany) MAK
MAK Class B (suspected carcinogen)†

1985-86 Toxicity Data‡
Human, oral, TD_{Lo}: 28 mg/kg; no toxic effects noted (*meta*)
Human, skin, TD_{Lo}: 4 mg/kg applied intermittently for 2 days produced behavioral (changes in motor activity) and cyanosis (*meta*)
Rat, oral, LD_{50}: 83 mg/kg; toxic effects not yet reviewed (*meta*)
Cat, oral, LD_{Lo}: 29 mg/kg; no toxic effects noted (*para*)

* Mixed compound contains mostly the *meta* isomer
† Danger of cutaneous absorption.
‡ See NIOSH, *RTECS* (CZ1450000, *ortho*; CZ1350000, *meta*; CZ1525000, *para*), for additional mutation, reproductive, and toxicity data.

Section 3. Physical Data

Boiling Point: 606 °F (319 °C),* 572 °F (300 °C),† 570 °F (299 °C)‡
Melting Point: 245 °F (119 °C),* 192 °F (89 °C),† 343 °F (173 °C)‡
Vapor Pressure: < 1 mm Hg at 68 °F (20 °C)
Molecular Weight: 168.1

Specific Gravity: 1.565,* 1.546,† 1.63‡ at 64 °F (18 °C)
Water Solubility: 0.05%,* 0.02%,† 0.01%,‡
Other Solubilities: Soluble*† (slightly soluble‡) in alcohol, benzene, chloroform and ethyl acetate

Appearance and Odor: White crystals,* yellow crystals,† white crystals.‡

* *ortho*, † *meta*, ‡ *para*

Section 4. Fire and Explosion Data

Flash Point: 302 °F (150 °C)	Autoignition Temperature: None reported	LEL: None reported	UEL: None reported

Extinguishing Media: For small fires, use dry chemical, carbon dioxide (CO_2), water spray, or regular foam. For large fires, use water spray, fog, or regular foam. Apply water as fog in flooding amounts since solid streams of water may be ineffective. Use care when applying water, fog, or foam as they may cause frothing.

Unusual Fire or Explosion Hazards: Dinitrobenzene is highly friction and shock sensitive and capable of dust explosion. Closed containers may rupture when heated. Prolonged exposure to fire or heat may cause explosion due to spontaneous combustion. Combustion by-products include toxic nitrogen oxide (NO_x) fumes.

Special Fire-fighting Procedures: Since fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighters' protective clothing is not effective for fires involving dinitrobenzene. Use chemically protective clothing specifically recommended by the manufacturer or shipper. These may not provide thermal protection unless specifically stated by the manufacturer. Fight fire from as far away as possible. Apply cooling water to sides of fire-exposed containers until long after fire is extinguished. Stay away from ends of tanks. For massive fire in cargo area, use monitor nozzles or unmanned hose holders. If fire becomes uncontrollable or if container is exposed to direct flame, consider evacuation of a 1/2-mile radius. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Dinitrobenzene is thermally unstable and is highly shock- and friction-sensitive. Make sure containers are kept away from areas where shock and friction are likely to occur. Hazardous polymerization cannot occur.

Chemical Incompatibilities: Dinitrobenzene is incompatible with strong oxidizers, caustics, and metals such as tin and zinc. It is explosive when mixed with nitric acid (all isomers) and tetranitromethane (*meta*). The *para* isomer becomes volatile in contact with steam.

Conditions to Avoid: Shock, friction, heating, and contact with incompatibles.

Hazardous Products of Decomposition: Thermal oxidative decomposition of dinitrobenzene can produce carbon dioxide (CO_2), toxic nitrogen oxides and can explode.

Section 6. Health Hazard Data

Carcinogenicity: The IARC,[164] NTP,[142] and OSHA[164] *do not*, but the MAK Class B (suspected human carcinogen) *does* list dinitrobenzene as a carcinogen.

Summary of Risks: Dinitrobenzene is at least 5 times more toxic than its mono form and the *meta* isomer is considered the most toxicologically important, especially as a methemoglobin (pigment similar to hemoglobin in the blood but unable to combine reversibly with oxygen) former. Anoxia (oxygen deficiency in the body tissues of such severity as to cause permanent damage) and cyanosis (bluish-purple discoloration of the lips, skin, and nails from lack of oxygenated blood) due to methemoglobin formation are likely. Because the degree of exposure needed to produce symptoms is not documented, exposure limits are based on comparison to polynitroaromatic compounds.

Medical Conditions Aggravated by Long-Term Exposure: Blood and liver disorders.

Target Organs: Blood, eyes, liver, cardiovascular and central nervous systems (CNS).

Primary Entry Routes: Inhalation, skin contact and absorption, and ingestion.

Continue on next page

Section 6. Health Hazard Data, *continued*

Acute Effects: Dinitrobenzene dust inhalation can cause irritation of the respiratory tract and the formation of methemoglobin which is responsible for these symptoms: headache; nausea; vomiting; dizziness; yellowish color of the eyes, hair, and skin; difficulty breathing; general weakness, cyanosis; and possible progression to convulsions, coma, and death. When methemoglobin concentration reaches 15%, cyanosis is noticed. Up to 40% concentration, victim still is fine, insisting nothing is wrong. At over 40% methemoglobin, weakness and dizziness occur; after 70% coma, and at concentrations of 85 to 90%, ...h is likely. Skin contact produces symptoms from inhalation as well as irritation, small vesicles or blisters, redness and swelling, ulceration, and necrosis ...ue destruction). Introduction into eyes can cause irritation, redness and swelling of the lids, painful sensitivity to light, and may lead to severe eye ...mage. Ingestion also produces symptoms like those from inhalation as well as irritation of the mouth and stomach, stomach cramps, and diarrhea. A bitter almond taste or burning sensation in the mouth, dry throat, and thirst may also occur. If treatment is not received promptly for any route of exposure, death may occur, usually by cardiovascular collapse. Alcohol consumption, exposure to sunlight, or hot baths may aggravate symptoms.

Chronic Effects: Repeated or prolonged exposure may cause anemia, paresthesis in the feet, ankles, hands and visual reduction. There are also scattered reports of liver injury.

FIRST AID *Emergency personnel should protect against contamination!*

Eyes: Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. *Do not* allow victim to rub or keep eyes tightly shut. Consult a physician immediately.

Skin: *Quickly* remove contaminated clothing. Be aware that dinitrobenzene vaporizes easily and poses an inhalation hazard. Carefully dispose of contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. Pay special attention to ear canals, nasal cavities and skin beneath nails. For reddened or blistered skin, consult a physician.

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have that *conscious and alert* person take 2 tablespoons Ipecac (adult dose) and drink 1 to 2 glasses of water, then induce vomiting. After patient vomits, give 2 tablespoons of activated charcoal in 8 oz. of water to drink.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Effects may be delayed so keep victim under observation. Determine methemoglobin concentration at regular intervals until fully reduced to hemoglobin. Methylene blue treatment for methemoglobin may be needed: 1 to 2 mg/kg per dose (adult or child), intravenously as needed every 4 hr. Be aware that doses over 15 mg/kg may cause hemolysis.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Immediately notify safety personnel, isolate and ventilate area, deny entry and stay upwind. Shut off all ignition sources. Cleanup personnel should wear fully encapsulating, vapor-protective clothing. Use water spray to reduce vapors (in case of solution spills) and dike for containment since the water can become corrosive and toxic. For small dry spills, carefully scoop into clean, dry, containers and cover. Wet mopping can minimize dust creation. For small solution spills, take up with earth, sand, vermiculite or other absorbent, noncombustible material and place in containers for reclamation or disposal. For large solution spills, dike surface flow using soil, sandbags, foamed concrete, or foamed polyurethane. For water spills, if dissolved at more than 10 ppm, apply activated carbon at 10 times the spilled amount and use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. Follow applicable OSHA regulations (29 CFR 1910.120).

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

Listed as a RCRA Hazardous Waste (40 CFR 261.21): No. D001, Characteristic of Ignitability

Listed as a CERCLA Hazardous Substance* (40 CFR 302.4): Reportable Quantity (RQ), 100 lb (45.4 kg) [* per Clean Water Act, Sec. 311 (b)(4)]

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

...sted as a SARA Toxic Chemical (40 CFR 372.65)

...HA Designations

...ed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

...ection 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy.

Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For 5 mg/m³, use any dust or mist respirator except for single-use respirators. For 50 mg/m³, use any high-efficiency particulate filter or any SCBA with a full facepiece. For 200 mg/m³, use any supplied-air respirator with a half-mask operated in a pressure-demand or other positive-pressure mode. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a respiratory protection program that includes at least: training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Other: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent any skin contact. Butyl rubber protective clothing is recommended.

Ventilation: Provide general and local explosion-proof exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). ...ocal ex... ...ion-proof exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103]

...ety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder contaminated work clothing before wearing. Remove this material from your shoes and clean personal protective equipment.

...omments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

...ction 9. Special Precautions and Comments

...torage Requirements: Prevent physical damage to containers. Store in cool, dry, well-ventilated area away from heat, metals, oxidizing and reducing ...gents, and other incompatibles (Sec. 5). *Use detached storage!*

...ngineering Controls: To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to ...aintain concentrations at the lowest practical level. To prevent static sparks, electrically ground and bond all equipment used in dinitrobenzene manufacture, use, and storage.

Administrative Controls: Consider preplacement and periodic medical exams of exposed workers that emphasize the blood, liver, cardiovascular system and eyes. Also run liver function tests and a complete blood count. Also consider any reactions to medications or alcohol consumption.

Transportation Data (49 CFR 172.101, .102)

DOT Shipping Name: Dinitrobenzene, solid, *or* Dinitrobenzol
DOT Hazard Class: Poison B
ID No.: UN1597
...OT Label: Poison
...T Packaging Exceptions: 173.364, 173.345 (solution)
...T Packaging Requirements: 173.371, 173.346 (solution)

IMO Shipping Name: Dinitrobenzenes (*o-, m-, p-*)
IMO Hazard Class: 6.1
ID No.: UN1597
IMO Label: Poison
IMDG Packaging Group: II

...SDS Collection References: 26, 38, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 140, 148, 149, 153, 159, 162, 163, 164

Prepared by: M Gannon, BA; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: AC Darlington, MPH, MD; Edited by: JR Stuart, MS

RDX

DU008066 Revised 17-NOV-1993 Printed 16-JUL-1995

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Tradenames and Synonyms

DUPONT RDX (CYCLOTRIMETHYLENETRINITRAMINE)
CYCLOTRIMETHYLENETRINITRAMINE

Tradenames and Synonyms (Remarks)

PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES

The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember they are dealing with a powerful force and various devices and methods have been developed to assist them in directing this force. The user should realize this force, if misdirected, may either kill or injure.

WARNING

All explosives are dangerous and must be carefully handled and used following approved safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable Federal, State and local laws regulations and ordinances. See "Additional Information and References" below.

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS:
Product Information : 1-800-962-9919
Transport Emergency : CHEMTREC: 1-800-424-9300
Medical Emergency : 1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Cyclotrimethylenetrinitramine (RDX)	121-82-4	100

HAZARDS IDENTIFICATION

Potential Health Effects

RDX is a class A Explosives and detonation may cause severe physical injury, including death. Known health hazards of components or products of decomposition are given below.

Nitrogen oxides generated during detonation are skin, eye and respiratory system irritants.

CYCLOTRIMETHYLENETRINITRAMINE (RDX)

Oral LD50: 100 mg/kg in rats

RDX is toxic by ingestion. In chronic animal studies by ingestion, RDX caused lung and gastrointestinal tract congestion, anxiety psychoses, central nervous system diseases, abnormal reflexes and death. Reported human health effects include convulsions, either without warning or after several hours to 1-2 days of insomnia, restlessness and irritability. Seizures were followed by temporary amnesia, nausea and weakness. Immediately after convulsions, there was evidence of rapid pulse rate and hypertension. Recovery was eventually complete.

Early signs of overexposure may include headache, dizziness, nausea and vomiting. Overexposure may cause unconsciousness, with convulsions, rapid pulse, elevated systolic and depressed diastolic blood pressure.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

Get medical attention immediately if explosion causes physical injury.

INHALATION

If decomposition fumes are inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, flush skin for at least 15 minutes. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, Immediately give two glasses of water and induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

FIRE FIGHTING MEASURES

Flammable Properties

Hazardous gases/vapors produced in fire are nitrogen oxides.

Fire and Explosion Hazards:

Will Detonate if suitably primed, with severe impact, or by heat or flame.

Extinguishing Media

None

Fire Fighting Instructions

Evacuate personnel to a safe area. Do not fight fire. Isolate area. Guard against intruders.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

Control access to area and remove sources of friction, impact, heat, low level electrical current, electrostatic or RF energy.

HANDLING AND STORAGE

Handling (Personnel)

Avoid contact with skin. Wash thoroughly after handling.

Storage

Store in a well ventilated place. Store in a cool place. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.

Storage and distribution of explosives is regulated by the U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms (BAFT). Procedural requirements are described in 25 CFR 55, "Commerce in Explosives."

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation. Keep away from friction impact, heat, low level electrical current, electrostatic or RF energy. Do not consume food, drink or tobacco in areas where they may become contaminated with material.

Personal Protective Equipment

Eye/Face	:	Safety Glasses.
Additional	:	Cotton gloves, conductive soled shoes, surfaces and floors.

Exposure Guidelines

ICI Canada Inc.
P.O. Box 200, Station "A"
North York, Ontario
Canada, M2N 6H2

TNT

MATERIAL SAFETY DATA SHEET

Date Issued: 91 06 06

Index: EXP 0032/91B

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL THE ICI CANADA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT 1-800-561-3636.

PRODUCT IDENTIFICATION

Product Name: TNT
Chemical Name: 2,4,6-Trinitrotoluene
Synonyms: Methyltrinitrobenzene, alpha-TNT, Nitropel, TNT (TY1 Flake) (Military Grade), TNT (Flake), Triton, Trinitrotoluol, Trotyl, Tolite, Trinitrotoluene.
Chemical Family: High Explosives.
Molecular Formula: $(NO_2)_3C_6H_2CH_3$
Product Use: Blasting agent. Manufacture of packaged explosives and primers (cast explosive).

REGULATORY SECTION

Controlled Products Regulations Classification: This product is an explosive and is not regulated by WHMIS.

OSHA Hazard Communication (29CFR 1910.1200) Classification: Irritant (eye, skin and respiratory tract); skin sensitizer; explosive.

CANADIAN TDG ACT SHIPPING DESCRIPTION

Shipping Name: Trinitrotoluene (or TNT)
Shipping Class/Division: 1.1D
Product Identification No (PIN): UN0209
Packing Group: II

U.S. DOT Classification: Refer to the "Code of Federal Regulations."

Other Regulations: Not available.

Read the entire MSDS for the complete hazard evaluation of this product.

HAZARDOUS INGREDIENTS OF PRODUCT

Hazardous Ingredients	%(w/w)	ACGIH TLV	CAS No.
Trinitrotoluene	98-100	0.5 mg/m3	118-96-7

PHYSICAL PROPERTIES

Physical State: Solid.
Appearance and Odour: Pale yellow flakes or prills; practically odourless.
Odour Threshold: Not applicable.
Boiling Range (Deg. C): Decomposes at 270.
Melting/Freezing Point (Deg. C): 80.65 (pure TNT)
Vapour Pressure: 0.053 mmHg (@ 85 Deg. C).
Specific Gravity: 1.645 (crystals); 1.47 (molten) (water = 1).
Vapour Density: Not available.
Bulk Density: 0.94 g/cc
Evaporation Rate: Not applicable.
Solubility: 0.013 g/100 g of water at 20 Deg. C. Sparingly soluble in alcohol; soluble in benzene, toluene and acetone.
% Volatile by Volume: Not applicable.
pH: Not applicable.
Coefficient of Water/Oil Distribution: Not available.
Sensitivity to Mechanical Impact: One of the least sensitive of the high explosives. More sensitive in the liquid form than the solid.
Rate of Burning: Not available.
Explosive Power: 439 kJ/100 g
Sensitivity to Static Discharge: Not available.

REACTIVITY DATA

Stability:
Under Normal Conditions: Stable.
Under Fire Conditions: Flammable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Excessive heat, situations where product may be confined, and prolonged exposure to sunlight.
Materials to Avoid: Strong oxidizers and reducing agents, alkaline material and mineral acids.
Hazardous Decomposition or Combustion Products: When heated to decomposition, it emits toxic nitrogen oxide (NOx) fumes. Its combustion products include large amounts of black smoke and nitrogen oxide fumes (NOx).

FIRE AND EXPLOSION DATA

Flash Point (Deg. C) (Method): Not available.
Autoignition Temperature: Approx. 295-330 Deg. C.
Flammability Limits in Air (%): LEL: Not applicable.
UEL: Not applicable.

Fire Extinguishing Media: See below.

Fire Fighting Procedures: DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Immediately evacuate all personnel from the area.

Other Fire or Explosion Hazards: Not applicable.

TOXICOLOGICAL AND HEALTH DATA

Recommended Exposure Limit: See "HAZARDOUS INGREDIENTS OF PRODUCT" Section.

Toxicological Data:

Trinitrotoluene LD50 (oral,rat) = 795 mg/kg (1)

Carcinogenicity Data: The ingredient(s) of this product is (are) not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (Occupational Safety and Health Administration), and not listed as carcinogens by NTP (National Toxicology Program).

Reproductive Effects: No information is available and no adverse reproductive effects are anticipated.

Mutagenicity Data: No information is available and no adverse mutagenic effects are anticipated.

Teratogenicity/Fetotoxicity Data: No information is available and no adverse teratogenic/embryotoxic effects are anticipated.

Synergistic Materials: None known.

EFFECTS OF EXPOSURE WHEN:

. Inhaled: Product is irritating to the nose, throat and respiratory tract. May cause central nervous system (CNS) depression, liver damage, kidney damage and methemoglobinemia. See "Other Health Effects" Section.

. In contact with the skin: This product may cause irritation due to abrasive action. Prolonged and repeated contact may lead to dermatitis. May be absorbed through intact skin. May cause skin sensitization or other allergic responses. See "Other Health Effects" Section.

. In contact with the eyes: This product causes irritation, redness and pain. Prolonged and repeated contact may cause cataracts.

. Ingested: Ingestion of large amounts may cause nausea, gastrointestinal upset and abdominal pain. May cause central nervous system (CNS) depression, liver damage, kidney damage and methemoglobinemia. See "Other Health Effects" Section.

Other Health Effects: Initial manifestation of methemoglobinemia is cyanosis, characterized by navy blue, almost black lips, tongue, and mucous membranes, with skin colour being slate gray. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

Signs and symptoms of kidney damage generally progress from oliguria, to blood in the urine, to total renal failure.

If ingested, Nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include cyanosis (due to methemoglobin formation), nausea, dizziness and increased heart rate.

CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure.

Sensitization is the process whereby a biological change occurs in the individual because of previous exposure to a substance and, as a result, the individual reacts more strongly when subsequently exposed to the substance. Once sensitized, an individual can react to extremely low airborne levels, even below the TLV, or to skin contact.

FIRST AID PROCEDURES WHEN:

. Inhaled: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.

. In contact with the skin: Flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.

. In contact with the eyes: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.

. Ingested: If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain medical attention IMMEDIATELY.

Emergency Medical Care: Alcohol use may cause enhanced response to effects of TNT exposure. Individuals deficient in glucose-6-phosphate dehydrogenase may be at greater risk. Medical conditions that may be aggravated by exposure to this product include cardiovascular diseases and liver, blood and kidney disorders.

PREVENTATIVE MEASURES

Recommendations listed in this section indicate the type of equipment which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: Local exhaust ventilation required, if the product itself is handled.

Respiratory Protection: A NIOSH/MSHA-approved air-purifying respirator equipped with combined dust, mist, fume/organic vapour cartridges for concentrations up to 5 mg/m3 TNT. An air-supplied respirator if concentrations are higher or unknown.

Skin Protection: Gloves and protective clothing made from cotton should be impervious under conditions of use. The use of coveralls is recommended.

Eye Protection: Safety glasses with side shields are recommended to prevent eye contact.

Other Personal Protective Equipment: Locate safety shower and eyewash station close to chemical handling area.

Handling Procedures and Equipment: This product is an explosive and should only be used under the supervision of an experienced blaster.

Storage Temperature (Deg. C): See below.

Storage Requirements: Dry, secure magazine that is properly grounded. Do not expose to temperatures above 35 Deg. C.

Other Precautions: Use only with adequate ventilation and avoid breathing dusts/vapours. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use.

ENVIRONMENTAL PROTECTION DATA

Steps to be Taken in the Event of a Spill or Leak: Stop and contain spill. Wet spilled material and sweep up into strong plastic bags or plastic containers. Keep the material wet. Avoid use of metal tools. Be careful to avoid shock, friction and sparks. Notify applicable government authority if release is reportable or could adversely affect the environment.

Environmental Effects: Harmful to aquatic life at low concentrations. A concentration of 1.5 mg/L is toxic to fish. Can be dangerous if allowed to enter drinking water intakes. Product has an unaesthetic appearance and can be a nuisance.

Deactivating Chemicals: ((SOB None known.

Waste Disposal Methods: Do not dispose of waste with normal garbage, or to sewer systems. Burn under supervision of an expert at a government-approved explosive burning ground or destroy, by detonation in boreholes, with explosives in accordance with applicable local, provincial and federal regulations. Call upon the services of an ICI Technical Representative.

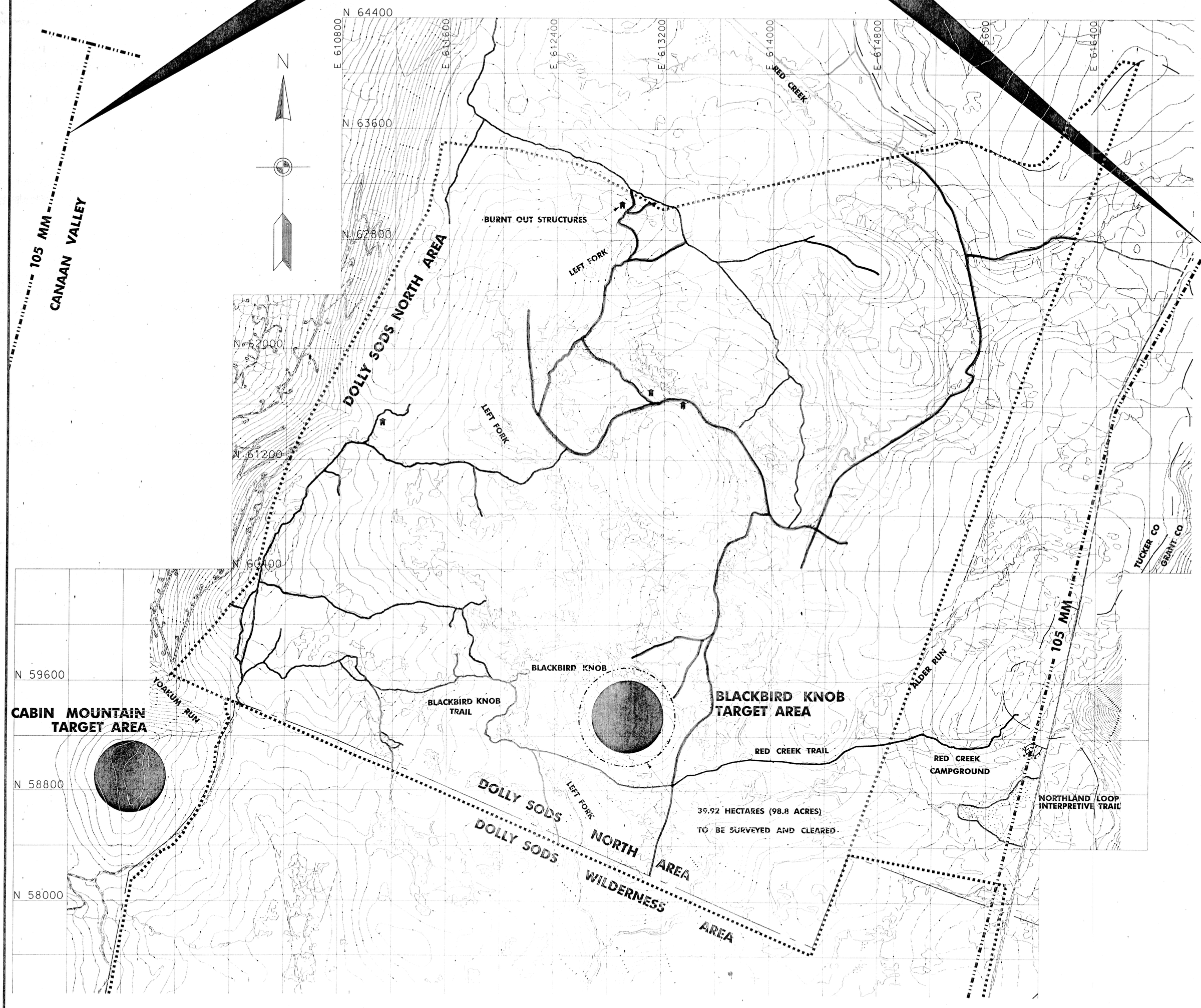
ADDITIONAL INFORMATION AND SOURCES USED

1. RTECS-Registry of Toxic Effects of Chemical Substances, On-line search, Canadian Centre for Occupational Health and Safety RTECS database, Vol I-V, 1985-1986 edition, Doris V. Sweet, Ed., National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, 1987.
2. U.S. Dept. of Health and Human Services, NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards, NIOSE, U.S. Dept. of Labour, 1978.
3. Explosives, R. Meyer, 2nd Edition, 1981, Verlag Chemie.
4. M.W. Nay et al, J. Wat. Pollut. Control Fed., 1974, Volume 46, 485-497.
5. Formula Book - Explosives, C-I-L Inc., Explosives, Research and Technical Department, current Edition.
6. Chemistry and Technology of Explosives, Vol. 1, T. Urbanski, Pergamon Press, 1983.
7. Windholz, Martha, Ed., The Merck Index, 10th ed., Merck and Co. Inc., Rahway, New Jersey, 1983.
8. Sax, N. Irving, Dangerous Properties of Industrial Materials, 7th ed., Van Nostrand Reinhold Co., New York, 1989.

Date Issued: 91 06 06
Date Revised: 91 06 06
MSDS Index No: EXP 0032/91B

Prepared By: Safety, Health and Environment (416) 229-8252

GUN EMPLACEMENTS



DOLLY SODS NORTH AREA

1000 750 500 250 0 1000

SCALE IN METERS

LEGEND

- DOLLY SODS WILDERNESS AREA BOUNDARY
- NORTH AREA BOUNDARY
- IDENTIFIED HUNTING CABINS
- TARGET AREAS
- TRAIL SEARCH AREAS

The project's work areas are divided into 3 sub-areas located in the Dolly Sods North Area. They total approximately 216.3 acres and are designated as:

1. Twenty-three miles of trails and 20 feet on each side. Total area acreage is 114.3.
2. Blackbird Knob with a total area acreage of 98.9.
3. Seventy-five camp sites, three cabin sites, and one trailer dump site. Total area acreage is 3.1.

INTRUSIVE OPERATION FRAGMENTATION DISTANCE

The maximum fragmentation distance is based on where the explosives effects of the UXO will not produce personnel casualties. The maximum fragmentation distance during intrusive operations was established on the worst known scenario, a detonation of a 155mm projectile on or near the surface. The maximum fragmentation was developed by CEHNC Blast Effect personnel and is 1,699 feet.

All unauthorized personnel will be kept outside the maximum fragmentation distance. If any unauthorized persons enter this exclusion zone, clearance operations will cease until the people are cleared from the area.

U.S. Army Corps of Engineers Huntington District

Revised February 16, 1996

U.S. Army Engineering and Support Center, Huntsville

SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR UNEXPLODED ORDNANCE (UXO) OPERATIONS

1. Introduction. There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision. Only those personnel absolutely essential to the operation shall be allowed in the restricted/exclusion area during UXO operations (DoD 6055.9-STD). Safety must become a firmly established habit when working with UXO. Safety is the leading edge of quality.

2. References. The following documents form a part of this document to the extent referenced.

ATFP 5400.7	Alcohol Tobacco and Firearms Explosives Laws and Regulations
_7 CFR Part 55	Commerce in Explosives
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 100-199	Transportation
DoD 6055.9-STD	DoD Ammunition and Explosives Safety Standards
DA Pam 385-64	Ammunition and Explosives Safety Standards
ETL 385-1-2	Generic Scope of Work for Ordnance Avoidance Activities
TM 9-1300-200	Ammunition General
TM 9-1300-214	Military Explosives
TM 9-1375-213-12	Operator's and Organization Maintenance Manual (Including Repair Parts and Special Tools List); Demolition Materials

3. Definitions

a. Unexploded Ordnance (UXO). An item of ordnance which has failed to function as designed, or has been abandoned or discarded, and is still capable of functioning and causing injury to personnel or damage to material.

b. UXO Procedures. UXO procedures include but are not limited to the following actions:

(1) Gaining access to (manual excavation) and identifying subsurface anomalies, and assessing condition of buried UXO.

(2) Identifying and assessing condition of surface UXO.

(3) Recovery and final disposal of all UXO.

c. UXO Related procedures: UXO related procedures include but are not limited to the following:

(1) Location and marking of subsurface anomalies.

(2) Location and marking of suspected surface UXO.

(3) Transportation and storage of recovered UXO.

(4) Utilizing Earth Moving Machinery (EMM) to excavate soil to no closer than approximately 12 inches of a subsurface anomaly.

d. UXO Qualified Personnel: UXO qualified personnel are US citizens who have graduated from the US Army Bomb Disposal School, Aberdeen, MD, or the US Naval Explosive Ordnance Disposal (EOD) School, Indian Head, MD. Graduates of the EOD assistant Course, Redstone Arsenal, AL, or Elign AFB, FL with more than three years combined active duty military EOD and contractor UXO experience shall also be UXO qualified.

4. General Safety Concerns.

a. UXO operations shall not be conducted until a complete plan for the operation involved is prepared and approved. Plans shall be based upon limiting exposure to a minimum number of personnel, for a minimum time, to the minimum amount of UXO, consistent with safe and efficient operations.

b. Only UXO qualified personnel shall be involved in UXO procedures. Non-UXO qualified personnel may be utilized to perform UXO related procedures when supervised by UXO qualified personnel. All personnel engaged in operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures.

c. The use of electroexplosive devices (EED) susceptible to electromagnetic radiation (EMR) devices in the radio frequency (RF) range, that is, radio, radar, and television transmitters, has become almost universal.

d. Some ordnance is particularly susceptible to EMR (RF) emission.. A knowledge of ordnance that is normally unsafe in the presence of EMR (RF) is important so preventive steps can be taken if the ordnance is encountered in a suspected EMR (RF) field.

(2) The presence of antennas, communication and RADAR devices should be NOTED on initial site visits and/or preliminary assessments.

(3) When potential EMR hazards exist, the site shall be electronically surveyed for MR/RF emissions and the appropriate actions will be taken. Minimum safe distances rom EMR/RF sources are listed in Tables 2-2, 2-3, and 2-4 of TM 9-1375-213-12.

f. Do not wear outer or undergarments made of materials which have high static generating characteristics when working on UXOs. Materials of 100 percent polyester, nylon, silk, or wool are highly static-producing. Any person handling a UXO suspected of containing EEDs will ground himself/herself prior to touching the UXO. Refer to DA Pam 385-64 for more information regarding non-static producing attire.

5. UXO Safety Precautions for Site Characterization.

a. Make every effort to identify the UXO. Visually examine the item for markings and other identifying features such as shape, size, and external fittings. However, do not move the item to inspect it. If an unknown UXO is encountered, the US Army Engineering and Support Center, Huntsville (USAESCH) representative will be notified.

b. Foreign UXO were returned to the United States for exploitation and disposal. When a records search indicates the possibility of foreign UXO being on a site, appropriate safety precautions and procedures will be incorporated into UXO operation plans.

c. Any time a suspected chemical munition is encountered, all personnel will

withdraw up wind from the munition. A two person UXO team, located upwind, shall secure the munition until relieved by the Technical Escort Unit (TEU) or Explosive Ordnance Disposal (EOD) personnel.

d. Ordnance items which penetrate the earth to a depth where the force of the explosion is not enough to rupture the earth's surface forms an underground cavity called a camouflet. Camouflets will be filled with the end product of the explosion, carbon monoxide gas. Camouflet detection and precautions must be considered if a records search indicates the site was used as an impact area.

e. Avoid inhalation of, and skin contact with, smoke, fumes, and vapors of explosives and related hazardous materials.

f. Consider UXO which has been exposed to fire and detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents which render it much more sensitive than it was in its original state.

g. Do not rely on the color coding of UXO for positive identification of contents. Munitions having incomplete, or improper color coding have been encountered.

h. Avoid the area forward of the nose of a munition until it can be ascertained the item does not contain a shaped charge. The explosive jet can be fatal at great distances forward of the longitudinal axis of the item. Assume any shaped charge munitions to contain a piezoelectric (PZ) fuzing system until the fuzing system is positively identified. A PZ fuze is extremely sensitive, can function at the slightest physical change, and may remain hazardous for an indefinite period of time.

i. Examine a projectile for the presence or absence of an unfired tracer. Also examine the item for the presence or absence of a rotating band and it's condition.

j. Approach an unfired rocket motor from the side. Ignition will create a missile hazard and hot exhaust.

(1) Do not expose rocket motors to any EMR source.

(2) If an unfired rocket motor must be transported, it shall be positioned in the direction which offers the least exposure to personnel in the event of an accidental ignition.

k. Consider an emplaced landmine armed until proven otherwise. It may not be possible to tell, or it may be intentionally rigged to deceive.

(1) Many training mines contain firing indicator charges capable of inflicting serious

injury.

(2) Exercise care with wooden mines that have been buried for a long time. Because of soil conditions, the wood deteriorates and the slightest inadvertent pressure/movement may initiate the fuze.

l. Assume a practice UXO contains a live charge until it can be determined otherwise. Expended pyrotechnic/practice devices may contain red/white phosphorus residue. Due to incomplete combustion, phosphorous may be present and reignite spontaneously if subjected to friction or the crust is broken and the contents exposed to air."

m. Do not approach a smoking white phosphorus (WP) UXO. Burning WP may detonate the burster or dispersal explosive charge at any time.

n. If the positive identification of suspected explosive materials is required, procedures in Chapter 13, TM 9-1300-214, " Military Explosives" or other approved explosives analysis shall be used to identify the explosives.

. Ordnance Avoidance for HTRW Activities.

a. Investigative activities on potential ordnance contaminated sites will be accomplished using approved ordnance avoidance procedures.

b. HTRW ordnance avoidance procedures are detailed in Engineering Technical Letter 385-1-2. This ETL is available on the Internet, or through the Quality and Technology team at USAESCH.

7. Restricted/Exclusion Area Operations.

a. On Ordnance and Explosives sites, the contractor's site safety personnel shall establish a restricted/exclusion area for each UXO team operating on the site. The purpose of the area is for the protection of the public and other personnel from the blast and fragmentation hazards of an accidental detonation. The area shall be establish based on the following minimum factors:

(1) Previous site use that caused the contamination: impact area, open burn/ open detonation, burial, etc..

(2) Project type: surface clearance, subsurface clearance, sifting operation, sampling, etc..

(3) Known ordnance contamination, distances to public exposure, terrain, etc..

b. When multiple UXO teams are operating on a site, the restricted/exclusion area and team separation distances shall never be less than 200 feet.

c. During the time frame that UXO operations are being accomplished, only personnel necessary for the UXO operation shall be within the restricted/exclusion area. When non-essential personnel enter the restricted/exclusion area, all UXO operations will cease.

(1) Plan for, provide, and know the measures to be taken in the event of an accident.

(2) Provide a designated emergency vehicle in the area in case of an accident or other emergency.

(3) Coordination with the appropriate airspace representative shall be conducted and the appropriate notification procedures arranged.

(4) When non-essential personnel must enter the restricted/exclusion area, the llowing must be accomplished: a) The individual must receive a safety briefing, b) be scorted by a UXO qualified individual; and c) All UXO operations must cease within the fragmentation radius of the largest item expected to be encountered within the area.

d. Before any movement of a UXO, the fuze condition must be ascertained. If the condition is questionable, consider the fuze to be armed. The fuze is considered the most hazardous component of a UXO, regardless of type or condition.

(1) In general, a projectile containing a Base Detonating (BD) fuze is to be considered armed if the projectile has been fired.

(2) Arming wires and pop out pins on unarmed fuzes should be secured by taping in place prior to movement.

(3) Do Not dismantle or strip any UXO.

(4) Do Not depress plungers, turn vanes, or rotate spindle, levers, setting rings, or other external fittings on UXO's. Such actions may arm, actuate, or function the UXO.

(5) Do Not subject mechanical time fuzes to any unnecessary movement.

(6) Do Not remove any fuzes from UXO's.

(7) Some ordnance items do not contain any positive safety features. Positively identify and review all safety precautions prior to handling any ordnance.

e. Personnel working within the Restricted area/Exclusion zone shall comply with the following:

(1) Do not conduct operations without an approved Site Specific Safety and Health Plan and an approved Work Plan.

(2) Do not smoke, except in authorized areas.

(3) Do not have fires for heating or cooking, except in authorized areas.

(4) Do not conduct explosive operations during electrical, sand, dust, or snow storms.

(5) Explosive operations will be conducted during daylight only.

(6) During magnetometer operations, UXO teams shall not wear safety shoes or other footwear which would cause the magnetometer to present a false indication.

f. Do not undertake the handling or disposal of liquid propellant fuels or oxidizers if not familiar with the characteristics of the material.

g. Civil War projectiles shall be treated as any other UXO.

h. If records search indicated WP munitions were fired or destroyed in the area, extra care shall be taken when uncovering a buried UXO. A buried WP munition may be damaged and when exposed to air, may start burning and detonate. An ample supply of water and mud shall be immediately available if excavation reveals a WP UXO. Appropriate protective equipment (leather gloves, face shield, and flame-retardant clothing) and first aid shall also be immediately available.

8. Storage.

a. During Ordnance and Explosives projects, storage of explosives and UXO fall into two categories.

(1) On-DoD Installations.

(2) Off-DoD Installations.

b. On-DoD Installation Storage.

(1) The provisions of DoD 6055.9-STD shall be followed. Generally, an installation should have an explosive storage area that meets requirements in DoD 6055.9-STD.

Permitting and compliance requirements for existing facilities are an installation responsibility. Compatibility of explosives found in Chapter 3, DoD 6055.9 -STD shall be complied with. UXO awaiting disposal shall not be stored with other explosives.

(2) If an installation does not have an existing storage facility, the provisions of paragraph c. below shall apply.

c. Off-DoD Installation Storage.

(1) Generally, the contractor is responsible for construction of a temporary explosive storage area that meets all local, state, ATF requirements, and as much of DoD 6055.9-STD that is practical to implement.

(2) When establishing an explosive storage area, the following requirements must be met.

(a) The area shall, if possible, meet the inhabited building and public traffic route distances specified in DoD 6055.9-STD. If the distances are less than required by DoD 6055.9-STD, then a proposed barricading and berm plan to protect the public from accidental detonation must be submitted and approved.

(b) Magazines must meet requirements of ATF Regulations, and each magazine must have an Net Explosive Weight established for the explosives to be stored.

(c) Each magazine must have lightning protection IAW Chapter 7, DoD 6055.9-STD.

(d) Magazines must meet intramagazine distances as defined in Chapter 9, DoD 6055.9-STD.

(e) A physical security survey shall be conducted to determine if fencing or guards are required. Generally, a fence around the magazines is needed, but the contractor is responsible to determine the degree of protection required to prevent the theft of explosives and UXO.

d. A fire plan for the storage area shall be prepared and coordination with the nearby fire department shall be conducted. Placarding of magazines shall be in accordance with local, state, and federal requirements.

). Excavation Operations.

a. The usual method for uncovering buried UXO is to excavate by hand. Hand excavation is the most reliable method for uncovering UXO, but unless the UXO is very

near the surface, hand excavation exposes more people to the hazard of detonation for a longer period of time than any other method. Hand excavation will be accomplished only by UXO qualified personnel.

b. Earth moving machinery (EMM) may be used to excavate buried UXO, if the UXO is estimated to be deeper than 12 inches. EMM shall not be used to excavate within 12 inches of an UXO. When excavation gets within approximately 12 inches of an UXO, hand excavation shall be used to uncover the UXO. EMM may be operated by non-UXO personnel, under the direct supervision of UXO personnel.

(1) If more than one EMM will be used on the same site, they will be separated by the same separation distances required for multiple teams on that site.

(2) During excavation operations, only those personnel absolutely necessary for the operation shall be within the restricted area/exclusion zone.

(3) Excavation and trenching shall comply with the provisions of 29 CFR 1926 subpart P.

10. Disposal Operations.

a. As a general rule, UXO will be detonated in place when the situation allows. All detonation-in-place operations shall be conducted by electrical means to assure maximum control of the site, except in situations where static electricity or EMR hazards are present. Non-electrical means can be used when the situation dictates.

(1) Do not allow one person to work alone in disposal operations. At least one person shall be available near the disposal site to give warning and assist in rescue activities in the event of an accident.

(2) Loose initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. These explosives manifest extreme sensitivity to friction, heat, and impact. Extra precautions may be required when handling these types of explosives. Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation, the sensitivity of these explosives is greatly increased when dry.

(3) Only condition "Code A" or "Code C" explosive items shall be used as donor explosives for disposal operations.

(4) Exercise extreme care in handling and preparing high explosives for detonation. They are subject to detonation by heat, shock, and friction.

(5) Do not pack bomb fuze wells with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.

(6) Photo flash bombs must be handled with the same care as black powder filled munitions.

(7) WP UXO shall not be detonated into the ground. The UXO shall be counter-charged on the bottom center line when possible.

b. The following safety rules will be adhered to at all times:

(1) Carry blasting caps in approved containers and keep them out of the direct rays of the sun, and located at least 25 feet from other explosives, until they are needed for priming.

(2) Do not handle, use, or remain near explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

(3) Do not use explosives or accessory equipment that is obviously deteriorated or amaged. They may cause a premature detonation or fail completely.

(4) Always point the explosive end of a blasting cap, detonators, and explosive devices away from the body during handling.

(5) Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap.

(6) Use electric blasting caps of the same manufacture for each demolition shot involving more than one cap.

(7) Do not bury blasting caps. Use detonating cord to position blasting caps above the ground. Buried blasting caps are subject to unobserved pressures and movement which could lead to premature firing or misfires.

(8) Test electric blasting caps for continuity at least 25 feet from any other explosives prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to be connected to the firing circuit.

c. When disposing of explosives by detonation, do not approach the disposal site for at least thirty minutes, after the expected detonation time, in the event of a misfire.

When conducting non-electric procedures, the wait time shall be thirty minutes plus time fuse burn time.

d. A post-search of the detonation site shall be conducted to assure a complete disposal was accomplished.

e. If the situation dictates, protective measures to reduce shock, blast, and fragmentation shall be taken. Army Technical Manual (TM) 5-855-1, Fundamentals of Protective Design for Conventional Weapons, contains data on blast effects, ground shock, cratering, ejection, and fragmentation. The following distances shall be used unless protective measures are implemented.

(1) For non-fragmenting explosive materials, evacuation distance should be a minimum of 1250 feet.

(2) For fragmenting explosive materials, evacuation distance should be a minimum of 2500 feet. For bombs and projectiles with caliber 5-inch or greater, use a minimum evacuation distance of 4000 feet.

(3) Items with lugs, strong backs, tail plate sections, etc., should be oriented away .om personnel locations as these items tend to travel further than normal fragmentation.

f. Consideration should be given to tamping the UXO to control fragments, if the situation warrants. Fragments shall be minimized not only to protect personnel but also property, such as buildings, trees, etc.

g. Open burning of explosives and smokeless powder or chemical decomposition of explosives shall not be accomplished without prior approval of the contracting officer.

(1) Do not inhale the smoke or fumes of burning pyrotechnic or incendiary materials. The fumes and dust from many of these materials are irritating and/or toxic if inhaled.

(2) Do not use water on incendiary fires. Water may induce a violent reaction or be completely ineffective, depending on the mixture.

(3) Anticipate a high order detonation when burning pyrotechnics or incendiary-'oaded UXO. Safety measures for personnel and property must be based upon this ossibility.

h. Inert Ordnance will not be disposed of or sold for scrap until the internal fillers

have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture, or air to expand and burst the sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to confined pressure.

11. Transportation.

a. If UXO must be transported off-site for disposal , the provisions of 49 CFR 100-199, DA Pam 385-64, state and local laws shall be followed.

b. Armed fuzes will only be transported when absolutely necessary and when all other avenues of "in place" disposal have been exhausted. Transportation to an on-site disposal area for these items is preferred.

c. Do not transport WP munitions unless it is immersed in water, mud, or wet sand.

d. If loose pyrotechnic, tracer, flare, and similar mixtures are to be transported, they shall be placed in #10 mineral oil or equivalent to minimize fire and explosion hazards.

e. Incendiary loaded munitions should be placed on a bed of sand and covered with and to help control the burn if a fire should start.

f. If an unfired rocket motor must be transported, it shall be positioned in such a manner as to offer the maximum protection to personnel in the event of an accident.

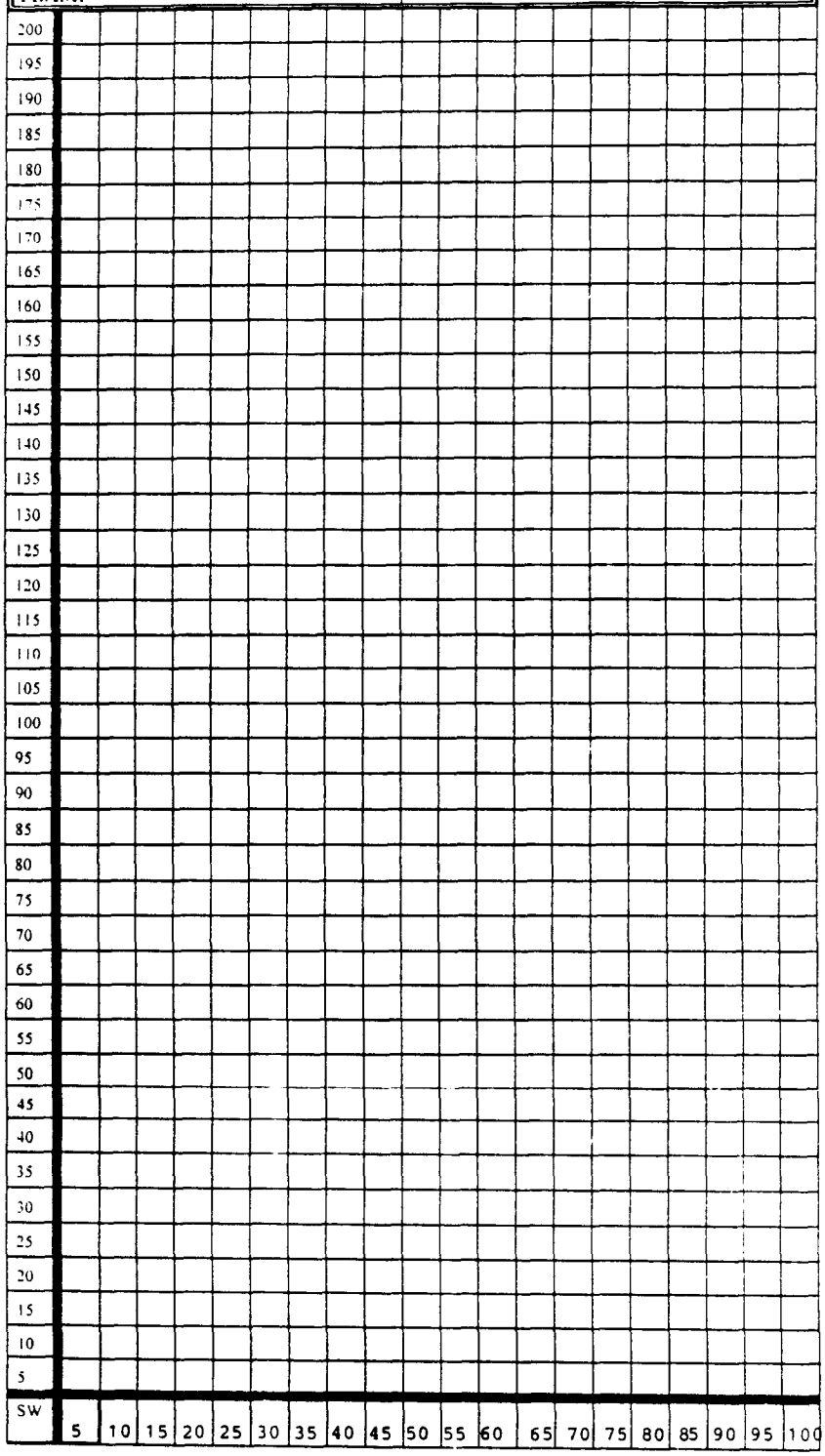
g. If base-ejection type projectiles must be transported to a disposal area or collection point, the base will be oriented to the rear of the vehicle and the projectile secured, in the event the ejection charge functions in route.

h. If an UXO, with exposed hazardous filler (HE, etc), has to be moved to a disposal area, the item shall be placed in an appropriate container with packing materials to prevent migration of the hazardous filler. Padding should also be added to protect the exposed filler from heat, shock, and friction.

HFA GRID LOCATION FORM

Each square is 5 feet by 5 feet

AREA:	SITE:	GRID:	PLAN:	CONTACTS:	DIGS:
TEAM:			DATE:		



1. _____depth

2. _____depth

3. _____depth

4. _____depth

5. _____depth

6. _____depth

Small Arms:_____

Small Arms:_____

STANDARD OPERATING PROCEDURE FOR NOTIFICATION OF UXO OPERATIONS

PURPOSE: To define the procedures to be used for notifying required local authorities or necessary personnel.

EMERGENCIES: In all cases emergency notification will be made directly to the Emergency 911 system via the cellular telephone. In all cases, stay on the line until help arrives.

ROUTINE: The HFA Project Manager/SUXOS will notify the following personnel of all significant events occurring within the workday, including in-place demolition of UXO.

CEHNC Safety Representative	**ON SITE**
Grant County Emergency Center	**(304) 257-1212**
West Virginia State Police	**(304) 637-0200**
US Forest Service, Potomac District	**(304) 257-4488**

For demolition operations, the above authorities will be notified at least **one hour** in advance of detonation.

HUMAN FACTORS APPLICATIONS, INC.
Buckingham Green, 4950 Route 202, Bldg. #1, Suite 2A
Holicong, Pennsylvania 18928-0615

TIME SHEET

1997
(BI-WEEKLY)

(Employee Name) _____ (Employee Number) _____ WALDORF, MD (Organization Unit)

CLIENT ASSIGNMENTS (See Back of Timesheet)

Customer I.D. #	Job I.D. #	Labor Category															Total Hours

& PROPOSAL

GENERAL

ADMINISTRATION																
PAID TIME OFF																
PERSONAL LEAVE																
OVERHEAD																
TOTAL HOURS																

SIGNATURES _____ (Employee) _____ (Project Manager/Supervisor)

Overhead: Indirect Labor, Training, Downtime, Special Programs, Physicals

NOTE: Time sheets are due in the Holicong office by the close of business on the Monday following the end of the pay period covered. If you are giving your time sheet to your Supervisor or Project Manager, he or she will make sure it gets to Holicong on time. If you are sending it to Holicong directly, FAX it there (FAX # 215-794-7353) and send the original in the mail. DO NOT rely on the Post Office, FedEx, or any other delivery service to get it there on time. We have external constraints that require us to run the payroll Tuesday morning, so if we do not have your time sheet we can not pay you until the next payroll, two weeks later. If you have any question about whether or not we have received your time sheet, call the Personnel Administrator at 215-794-3535.

AN FACTORS APPLICATIONS, INC. - TRAVEL EXPENSE REPORT

NAME _____ DATE PERIOD ENDED _____ TRAVEL CLAIM # _____

HOME ADDRESS (STREET) _____ (CITY/STATE) _____

DAY	1	2	3	4	5	6	7
DATE							
TRAVEL FROM:							
DEPARTURE TIME:							
TRAVEL TO:							
ARRIVAL TIME:							
JOB #							

COMPANY PAID/CHARGE								TOTALS
COMMON CARRIER								
AUTO RENTAL								
HOTEL								
BUSINESS TELEPHONE*								
MISCELLANEOUS*								
TOTALS								

EMPLOYEE PAID/REIMBURSEMENT								
PERSONAL AUTO (# MILES)								
MILEAGE REIM. ($.31/MILE)								
TOLLS/PARKING/TAXI								
RENTAL								
DIEM								
HOTEL								
BUSINESS TELEPHONE*								
MISCELLANEOUS*								
TOTALS								DUE EMPLOYEE
TOTAL DAILY EXPENSES (L+U)								

PURPOSE OF TRIP/EXPLANATION OF MISCELLANEOUS ITEMS

ACCOUNTING DISTRIBUTION (for HOLICONG ONLY - DO NOT COMPLETE)

ACCOUNT / JOB #	$	$	$	$	$	$	$	TOTALS
TOTALS (SHOULD EQUAL TOTAL DAILY EXPENSES, "L" ABOVE)								

I, _____, certify all the above expenses have been incurred on behalf of HFA, Inc.

EMPLOYEE SIGNATURE / DATE

AUTHORIZED SIGNATURE (APPROVAL) / DATE

CREDIT CARD REPORT

CARDHOLDER ____________________ MONTH/YEAR ____________________

CARD NUMBER ____________________

OFFICE ____________________

NSACTION DATE	RECEIPT #	NAME OF VENDOR	DESCRIPTION OF ITEMS/SERVICE PURCHASED	COST	CUSTOMER ID/ JOB #

TES:

HUMAN FACTORS APPLICATIONS, INC.

RENTAL VEHICLES - MONTHLY REPORTING SITE _____

.T DAT _____ PREPARED BY _____

YR	MAKE	MODEL	VIN(last 6 digits)	DATE ACQUIRED	DATE DELETED

HFA Government Property Tracking Log

Contract Number:	Task Order Number:	Location:
Contractor Property Manager:	Site Supervisor:	Date:

Line No.	Description of Item Nomenclature Manufacturer	Model Number	Serial Number	CEIIND Number	Name of Supplier	Unit Price	Date Received on Site	Expendable	Non-Expendable	Remarks

SUXOS DAILY JOURNAL

DATE:	PROJECT:
SUXOS:	QC/SS:
TOTAL GRIDS CLEARED:	TOTAL EXCAVATI ONS :
TOTAL LIVE UXO:	TOTAL SCRAP: LBS
MAG TYPE:	MAG SETTING:
CLIENT: CEHND,	CONTRACT: DACA87-94-D-0019 T.O.
FIELD OPERATION TIME: HRS	GOV DELAY TIME: HRS
WEATHER:	TEMP:

GRIDS CLEARED	TOTAL UXO LIVE	TOTAL UXO INERT	BIP	TOTAL DIGS	TOTAL SCRAP	HAZ MAT FOUND	BKHOE REQ

COMMENTS:

SUXOS SIGNATURE:

DAILY TEAM LEADER JOURNAL

TEAM# _____

DATE:	PROJECT:
SUXOS:	QC/SSO:
TOTAL GRIDS CLEARED:	TOTAL EXCAVATI ONS:
TOTAL UXO:	TOTAL SCRAP: LBS
MAG TYPE:	MAG SETTING:
CLIENT: CEHND	CONTRACT: DACA87-94-D-0019, T.O.
FIELD OPERATION TIME: HRS	GOV DELAY TIME: HRS
WEATHER:	TEMP:

GRIDS CLEARED	TOTAL INERT UXO	TOTAL LIVE UXO	BIP Y/N	SMALL ARMS	TOTAL DIGS	TOTAL SCRAP	HAZ MAT LOCATED	BKHOE REQ

COMMENTS:

TM LEADER SIGNATURE:

WEEKLY SUMMARY

FOR THE WEEK ENDING:	LOCATION:
CONTRACT: DACA87-94-D-0019	TASK ORDER:
SUXOS:	PM:

CEHND SAFETY REP ON SITE:	
GRIDS SAMPLED THIS WEEK	
GRIDS MAGGED & FLAGGED THIS WEEK	
TOTAL GRIDS SAMPLED TO DATE	
AREAS COMPLETED THIS WEEK	
TOTAL LIVE UXO LOCATED THIS WEEK	
TOTAL LIVE UXO LOCATED TO DATE	
TOTAL INERT UXO RECOVERED THIS WEEK	
TOTAL INERT UXO RECOVERED TO DATE	
TOTAL SMALL ARMS RECOVERED THIS WEEK	
TOTAL SMALL ARMS RECOVERED TO DATE	
SCRAP REMOVED THIS WEEK, IN POUNDS	
SCRAP REMOVED TO DATE, IN POUNDS	

COMMENTS:

WEEKLY SUMMARY

WEEK ENDING:	TASK ORDER:	SITE:
SIGNIFICANT COMMENTS CONCERNING THE DAILY OPERATIONS:		
SIGNIFICANT OPERATIONS PLANNED FOR NEXT WEEK:		
SUXOS SIGNATURE:		

TOTAL MAN HOURS EXPENDED FOR THE

WEEK ENDING:	LOCATION:
CONTRACT: DACA87-94-D-0019	TASK ORDER:
SUXOS:	PM:

NUMBER OF PERS ON SITE BY DAY						TOTAL NUMBER OF MAN HRS BY DAY					
	MON	TUE	WED	THU	FRI	MON	TUE	WED	THU	FRI	TOTAL
PM											
SUXOS											
SSO											
UXOSUP											
UXOSPC											
TYPIST											

COMMENTS:

** THE HOURS LISTED ON THIS REPORT REFLECT ONLY THE HOURS PERSONNEL PHYSICALLY WORKED ON THE SITE, THEY DO NOT INCLUDE HOURS CHARGED TO ANNUAL LEAVE, SICK LEAVE OR HOLIDAY PAY.

COMMENTS:

PERSONNEL ON SITE

WEEK ENDING:	LOCATION:
CONTRACT: DACA87-94-D-0019	TASK ORDER:
SUXOS:	PM:

NAME POSITION TEAM#	MON	TUE	WED	THU	FRI

COMMENTS:

PERSONNEL ON SITE

WEEK ENDING:	LOCATION:
CONTRACT: DACA87-94-D-0019	TASK ORDER:
SUXOS:	PM:

NAME	POSITION	TEAM #	MON	TUE	WED	THU	FRI

COMMENTS:

PERSONNEL ON LEAVE OR SICK REPORT

WEEK ENDING:		SITE:					
NAME LV/SK	POSITION TM#	TUE	WE	THU	FRI		
COMMENTS.							

SMALL ARMS ACCOUNTING

DATE:	LOCATION:	
SUXOS: DAVE FRANDSEN	TASK ORDER:	
CARTRIGE TYPE	WEEKLY TOTAL	TOTAL TO DATE
5.56mm BALL		
5.56mm BALL, BELTED		
5.56mm BLANK		
5.56mm BLANK, BELTED		
7.62mm BALL		
7.62mm BALL, BELTED		
7.62mm BLANK		
.30 CALIBER BALL		
.30 CALIBER BALL, BELTED		
.30 CALIBER BLANK		
.30 CALIBER BLANK, BELTED		
.50 CALIBER BALL		
.50 CALIBER BALL, BELTED		
.223 CALIBER BLANK		
.45 CALIBER SHOT SHELL		
TOTAL ALL SMALL ARMS		

UXO BLOWN IN PLACE

WEEK ENDING:	SITE:	
DATE	UXO NOMINCLATURE	UXO LOCATION
COMMENTS:		

FUEL USED AND COST

FOR THE WEEK ENDING:		SITE:	
GASOLINE USED	GASOLINE COST	DIESEL USED	DIESEL COST
TOTAL FUEL USED AND COST TO DATE			T.O.
TOTAL GAS USED	TOTAL GAS COST	TOTAL DSL USED	TOTAL DSL COST
COMMENTS:			

VEHICLES AND EQUIPMENT

WEEK ENDING:	LOCATION:
CONTRACT: DACA87-94-D-0019	TASK ORDER:
SUXOS	PM:

VEHICLE TYPE	RENTED FROM	IDENTIFICATION OR VIN NUMBER	MILEAGE	TM#

COMMENTS:

UXO RECOVERED TOTALS

TM NUMBER	LOCATION
TM LEADER	DATE

UXO NOMENCLATURE	TOTAL LIVE	TOTAL INERT

HUMAN FACTORS APPLICATIONS, INC.
SITE VISITOR'S LOG
OEW OPERATIONS

CONTRACT NUMBER:_____ DELIVERY ORDER NUMBER:_____

LOCATION:_____

Date	Name	Title	Company	Safety Brief Received (initial)	U.S. Citizen		Time	
					Y	N	In	Out

VISITOR'S SAFETY BRIEFING

_____1 Point out safe area and restricted areas.

_____2. Point out potential hazards and risks.

_____3. Wear hard hats, safety glasses.

_____4. Watch where walking at all times.

_____5. Do not pick anything up.

_____6. Stay with escort.

_____7. Deposit matches and lighters in receptacles.

_____8. Brief on site evacuation plan and emergency procedures.

DAILY QC\SSO INSPECTION JOURNAL

DATE	PROJECT
QC\SSO	TASK #
CLIENT: CORPS OF ENGINEERS	CONTRACT # DACA 87-94-D-0019
WEATHER	TEMP

AREA / ITEM INSPECTED	SAT	UNSAT

COMMENTS / CORRECTIVE ACTIONS TAKEN IF REQUIRED:

QC\SSO SIGNATURE

PERIODIC QUALITY CONTROL JOURNAL

DATE	PROJECT
QC\SSO	TASK #
CLIENT: CORPS OF ENGINEERS	CONTRACT # DACA 87-94-D-0019
WEATHER	TEMP

GRID / AREA INSPECTED	SAT	UNSAT

COMMENTS / CORRECTIVE ACTIONS TAKEN IF REQUIRED:

QC\SSO SIGNATURE

MAGNETOMETER/METAL DETECTOR CHECK SHEET

SITE: **TASK ORDER#** **CONTRACT#**

TEAM# **TEAM LEADER:**

INSTRUMENT TYPE **SERIAL NUMBER**

DATE	OPERATIONAL CHECK	SAT	UNSAT	REMARKS

VEHICLE CHECK SHEET

SITE: **TASK ORDER #:** **CONTRACT #:**

TEAM #: **TEAM LEADER:**

DATE	UNDER HOOD	WALK AROUND	SAFETY EQPT	REMARKS

Indicate the condition of each check by stating SAT or UNSAT whichever is appropriate.

SUPERVISOR'S EMPLOYEE INJURY REPORT -

This is an official document to be initiated by the employee's supervisor. Please answer all questions completely. This report must forwarded to the employee's Regional Health and Safety office within 24 hours of the injury.

Injured's Name _____ Sex____ S.S. No_____ Birthdate_____

Home Address _____ City_____ State_____ Zip_____ Phone_____

Job title _____ Employee's P.C._____ Hire date_____ Hourly wage_____

SUPERVISOR

Date of incident _____ Time_____ Time reported_____ To whom? _____

Client name_____ Client address _____ Time shift began_____

Exact location of incident _____ Did employee leave work? ☐ No ☐ Yes When_____

Has employee returned to work? ☐ No ☐ Yes When_____ Did employee miss a regularly scheduled shift? ☐ No ☐

Doctor/Hospital name _____ Address_____

Witness name(s)_____ Statements attached? ☐ No ☐

Nature of injury _____ Exact body part_____

Medical attention: ☐ None ☐ First aid on site ☐ Doctor's office ☐ Hospital ER ☐ Hospitali

Job assignment at time of incident _____ Job:_____ Phase:_____ Task:_____ Subtask:_____

Describe incident _____

What unsafe physical condition or unsafe act caused the incident? _____

What corrective action has been taken to prevent recurrence? _____

Supervisor/Foreman _____ (Print) _____ Signature _____ Date

MANAGER

MANAGER

Comments on incident and corrective action_____

Manager's name _____ (Print) _____ Signature _____ Date

HEALTH AND SAFETY

HEALTH AND SAFETY

Concur with action taken? ☐ No ☐ Yes Remarks _____

OSHA Classification:

☐ Incident only ☐ First aid ☐ No lost workdays ☐ Lost workdays ☐ Restricted activity ☐ Fata

Days away from work_____ Days restricted work_____ Total days charged _____

☐ State jurisdiction ☐ Federal L&H ☐ Date ER submitted_____ Which claims office _____

Coding: A. Injury type or illness_____ B. Injured body parts_____ C. Activity at time of accident_____ D. Injury cause code_____

E. Agent code_____ F. Safety rule violated code_____ G. Accident prevention code_____

Name _____ (Print) _____ Signature _____ Date

A. TYPE OF INJURY OR ILLNESS

10 Laceration
12 Puncture
14 Contusion
16 Abrasion
18 Crushing Injury
Foreign Body
Burn-Thermal
24 Burn-Chemical
26 Fracture
28 Amputation
30 Hernia/Inguinal
31 Hernia/Other
32 Strain
34 Sprain
36 Dislocation
38 Heat Exhaustion/Heat Stress
40 Drowning
42 Asphyxiation
44 Systemic Poisoning
46 Dermatitis
48 Inflammation/Irritation
49 Pneumoconiosis
50 Respiratory Condition Due to Toxic Agents
51 Radiation
52 Heart Disease
54 Liver Damage
56 Kidney Damage
58 Mental Stress/Psychiatric
60 Repeated Trauma
62 Hearing Loss
64 Cancer
66 Other Occupational Disease
68 Fatality
70 Infectious Respiratory Disease
72 Miscellaneous-Not Otherwise Coded
74 Not Work Related

B. INJURED BODY PARTS
eed
2 Face
14 Ear
16 Eye
17 Nose
18 Teeth/Mouth
20 Neck
22 Shoulder
24 Chest
26 Abdomen
28 Upper Arm
30 Elbow
32 Lower Arm
34 Wrist
36 Hand
38 Thumb
40 Fingers
42 Back/Spine
44 Hip/Pelvis
46 Thigh
48 Knee
50 Lower Leg
52 Ankle
54 Heel
56 Metatarsal
58 Toes
60 Lungs
62 Heart
63 Liver
64 Other Internal Organs
66 Psyche
68 Not Otherwise Coded

C. ACTIVITY AT TIME OF ACCIDENT
ning
14 Operating Heavy Equipment
16 Hot Work
18 Hydroblasting
19 Washing
20 Cutting
22 Lifting Or Manual Carrying
24 Walking
26 Running
28 Jumping
30 Hammering
32 Sampling
34 Loading/Unloading Vacuum Trucks
36 Pulling Vacuum Hoses
38 Climbing
40 Shoveling
41 Sweeping
42 Pulling
44 Pushing
46 Opening Or Closing
48 Reaching Or Stretching
50 Standing, Observing Or Inspecting
52 Piling Or Stacking
54 Maintenance
56 Training
58 Chemical Packaging
60 Laboratory Analysis
62 Washing Glassware
64 Tank Cleaning
66 Asbestos Removal
68 Nuclear Decontamination
70 Drilling
72 Pond Maintenance
74 Using Hand Tools
76 Not Otherwise Classified

D. INJURY CAUSE CODE

STRUCK BY
01 Falling Object
02 Flying Object
03 Swinging Object
04 Tipping, Sliding Or Rolling Object
05 Motor Vehicle
06 Altercation
07 All Other Moving Objects

STRAIN OR OVEREXERTION
10 Lifting (Back)
11 Lifting (Other Than Back)
12 Pulling Or Pushing
13 Reaching, Twisting Or Over Extending
14 Cumulative Trauma

FALL FROM ELEVATION
20 Manway Opening
21 Ladder Or Scaffold
22 Machinery Or Stationary Equipment
23 Piled Materials
24 Stairs
25 Heavy Equipment
26 Vacuum Trucks
27 Other Trucks

FALL FROM SAME LEVEL
30 Slip
31 Trip

STRUCK AGAINST
40 Moving Object
41 Stationary Object
42 Sharp Object

CAUGHT IN, UNDER OR BETWEEN
50 Running Or Meshing Objects
51 Point Of Operation (Machinery Or Equipment)
52 Other Than Point Of Operation
53 Moving And Stationary Objects
54 Two Moving Objects

EXPOSURE TO
60 Cold
61 Heat
62 Electric Current
63 Chemicals
64 Radiation
65 Noise
66 Dust
68 Poison Oak/Ivy

MISCELLANEOUS
70 Inhalation
71 Ingestion
72 Absorption
73 Job Stress
74 Insect Or Animal Bites

E. AGENT CODE
10 Grading/Compacting Equipment
11 Excavating/Drilling Equipment
12 Crane
14 Vacuum Truck
16 End Dump Truck
18 Automobile
19 All Other Motor Vehicles
20 Hand Tools
22 Power Tools
24 Laboratory Glassware
26 Laboratory Equipment
28 Sampling Equipment
30 Hoses
32 Hydroblaster
34 High Pressure Washing
36 Hand Truck
38 Ladder
40 Scaffold
42 Stairs
44 Slippery Surface
45 Ice Or Snow
46 Uneven Surface
48 Hot Liquid/Gases
50 Toxic Material
52 Oxygen Deficient Atmosphere
54 Flammable Materials
56 Electric Current
58 Radiation
60 Door
62 Compressed Gas
64 Gas Cylinder
66 Respirator/Breathing Apparatus
68 Protective Clothing
70 Other Clothing/Jewelry
72 Mobile Treatment Equipment
73 Fixed Treatment Facility

F. SAFETY RULE VIOLATED CODE
01 IT Safety Rule
02 Client Safety Rule
03 Compressed Air
05 Wire Rope, Clips And Slings
06 Locking Out Equipment
07 Piling And Blocking Of Materials
08 High Voltage Rules
09 Eye And Face Protection
10 Portable Ladders
11 Underground Construction
12 Cold Weather Hazards
13 Loading/Unloading
14 Hand Tools
15 Cleaning And Repair To Tools
16 Protective Clothing And Appa
17 Flammable And Combustible Liquids
18 Job Procedure
19 Portable Electrical Tools
21 Flammable Gases
22 Fall Protection
23 Grinding Wheel
24 Machine Guarding
25 Scaffolding
26 Handling Materials
27 Horse Play And Fighting
28 Housekeeping
29 Unauthorized Walkways
30 Welding Equipment
31 Machine Operations
32 Hand Tools
35 Crane Rules
37 Acids And Caustics
38 Tripping And Slipping Hazards
42 Respirator Protection
43 Hearing Protection
44 Confined Space
45 Late Report of Minor Accident
46 Temporary Cords And Lamps
47 Improper Operation Of Equipment
48 Hydroblast
50 Motor Vehicle
51 Driving Under the Influence (OUI)
52 Fork Lifts
54 Air Compressors And Receivers
60 No Safety Rule Violation
62 Did Not Review Job With Health and Safety

G. ACCIDENT PREVENTION CO
02 Install Guards Or Safety Device
04 Install Warning System
06 Store Flammables And Combustibles In Approved Manner
08 Block Or Secure Mat' u On Machinery Against U spected Movement
10 Additional Housekeeping Needed
12 Remove Protruding Objects
14 Maintain Necessary Clearance
16 Control Or Remove Atmospheric Conditions
18 Maintain Proper Piling of Storage
20 Install Additional Illumination
22 Personal Protective Equipment
24 Review Project with Health & Safety

INSTRUCTION/RE-INSTRUCTION ON
50 Use Of Equipment
52 Proper Operation Or Working Speed
54 Use Of Warning Devices
56 Proper Use Of Safety Devices
58 Use Of Tools In Good Repair
60 Proper Lifting Practices
62 De-Energizing Equipment Before Adjusting Or Repairing
64 Stay Off Moving Equipment
66 Horse Play
68 Wearing Of Personal Protective Equipment
70 Proper Chemical Handling Procedure
72 Safety Work Rules
74 IT Training Class

ACCIDENT/INJURY INVESTIGATION

Date _____ Profit\Cost Center_____ Date of Accident/injury_____
Employee Name_____
Supervisor Name_____
Job Number/Name_____/_____
Location of Accident/Injury_____

- Accident/injury Classification

Injury	Vehicle	DOT
0 Near Miss	0 Chargeable	0 DOT Vehicle
0 First Aid	0 Non-Chargeable	0 DOT Reportable
0 OSHA Recordable	0 Not at Fault	
0 Lost Workday		General Liability 0

- Description (Provide facts, describe how Incident occurred, provide diagram (on back) or photos)

- Analysis 1 (What unsafe acts or conditions contributed to the Incident?)

- Analysis 2 (What systematic or management deficiencies contributed to Incident?)

- Corrective Action(s) (List corrective action items, responsible person scheduled completion date)

- Witnesses (Attach statements or Indicate why unavailable)

Investigated By _____ _____ _____
Print Name Signature Date

Manager _____ _____ _____
Print Name Signature Date

(Attach Additional pages if needed)

Medical Treatment:

The following are generally considered medical treatment. Work-related injuries for which this type of treatment was provided or should have been provided are almost always recordable:

- Treatment of INFECTION
- Application of ANTISEPTICS during second or subsequent visit to medical personnel
- Treatment of SECOND OR THIRD DEGREE BURN(S)
- Application of SUTURES (stitches)
- Application of BUTTERFLY ADHESIVE DRESSING(S) or STERI STRIP(S) in lieu of sutures
- Removal of FOREIGN BODIES EMBEDDED IN EYE
- Removal of FOREIGN BODIES FROM WOUND; if procedure is COMPLICATED because of depth of embedment, size, or location
- Use of PRESCRIPTION MEDICATIONS (except a single dose administered on first visit for minor injury of discomfort)
- Use of hot or cold SOAKING THERAPY during second or subsequent visit to medical personnel
- Application of hot or cold COMPRESS(ES) during second or subsequent visit to medical personnel
- CUTTING AWAY DEAD SKIN (surgical debridement)
- Application of HEAT THERAPY during second or subsequent visit to medical personnel
- Use of WHIRLPOOL BATH THERAPY during second or subsequent visit to medical personnel
- POSITIVE X-RAY DIAGNOSIS (fractures, broken bones, etc.)
- ADMISSION TO A HOSPITAL or equivalent medical facility FOR TREATMENT.

First Aid Treatment:

The following are generally considered first aid treatment (e.g., one-time treatment and subsequent observation of minor injuries) and should not be recorded if the work-related injury does not involve loss of consciousness, restriction of work or motion, or transfer to another job:

- Application of ANTISEPTICS during first visit of medical personnel
- Treatment of FIRST DEGREE BURN(S)
- Application of BANDAGE(S) during any visit to medical personnel
- Use of ELASTIC BANDAGE(S) during first visit to medical personnel
- Removal of FOREIGN BODIES NOT EMBEDDED IN EYE if only irrigation is required
- Removal of FOREIGN BODIES FROM WOUND; if procedure is UNCOMPLICATED, and is, for example, by tweezers or other simple technique
- Use of NONPRESCRIPTION MEDICATIONS AND administration of single doses of PRESCRIPTION MEDICATION on first visit for minor injury or discomfort
- SOAKING THERAPY on initial visit to medical personnel or removal of bandages by SOAKING
- Application of hot or cold COMPRESS(ES) during first visit to medical personnel
- Application of OINTMENTS to abrasions to prevent drying or cracking
- Application of HEAT THERAPY during first visit to medical personnel
- Use of WHIRLPOOL BATH THERAPY during first visit to medical personnel
- NEGATIVE X-RAY DIAGNOSIS
- OBSERVATION of injury during visit to medical personnel.

The following procedure, by itself, is not considered medical treatment:

- Administration of TETANUS SHOT(S) or BOOSTER(S). However, these shots are often given in conjunction with more serious injuries; consequently, injury requiring these shots may be recordable for other reasons.

Loss of consciousness. If an employee loses consciousness as the result of a work-related injury, the case must be recorded not matter what type of treatment was provided. The rationale behind this recording requirement is that loss of consciousness is generally associated with the more serious injuries.

Restriction of work or motion. Restricted work activity occurs when the employee, because of the impact of a job-related injury, is physically or mentally unable to perform all or any part of his or her normal assignment during all or any part of the workday or shift. The emphasis is on the employee's ability to perform normal job duties. Restriction of work or motion may result in either a lost worktime injury or a nonlost-worktime injury, depending upon whether the restriction extended beyond the day of injury.

Transfer to another job. Injuries requiring transfer of the employee to another job are also considered serious enough to be recordable regardless of the type of treatment provided. Transfers are seldom the sole criterion for recordability because injury cases are almost always recordable on other grounds, primarily medical treatment or restriction of work or motion.

Buckingham Green
4950 Route 202
Building 1 · Suite 2A
Holicong, PA 18928-0615
Tel (215) 794-3535
Fax (215) 794-7353
e-mail: telizabeth@aol.com

Human Factors Applications
INCORPORATED

ORDNANCE & EXPLOSIVE WASTE REMEDIATION

VEHICLE ACCIDENT REPORT

Vehicle

DRIVER _____ ACCIDENT DATE _____ DRIVERS LICENSE _____ STATE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

WORK PHONE ( ) _____ SS# _____ PC # _____

VEHICLE # _____ YEAR _____ MAKE _____ MODEL _____ PLATE # _____

STATE _____ VEHICLE OWNER: ☐ ITC ☐ LEASED/RENTED ☐ PRIVATE VEHICLE

IF NOT ITC OWNED: OWNER _____ ADDRESS _____

_____ PHONE _____

VEHICLE DAMAGE _____ EST. REPAIR COST _____

Other Vehicle(s)

Use separate sheet if more than one

DRIVER _____ DRIVERS LICENSE _____ STATE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE ( ) _____ SS# _____

OWNERS NAME (CHECK IF SAME AS DRIVER ☐) _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

INSURANCE COMPANY _____ POLICY # _____

AGENTS NAME _____ ADDRESS _____ PHONE # _____

VEHICLE: YEAR _____ MAKE _____ MODEL _____ PLATE # _____ STATE _____

VEHICLE DAMAGE _____

PASSENGERS ☐ YES (List on reverse) ☐ NO INJURIES ☐ YES (List names & address on reverse) ☐ NO

Accident Description

DATE _____ TIME _____

LOCATION _____

DESCRIPTION _____

WITNESS _____ ADDRESS _____

_____ PHONE # _____

POLICE OFFICER'S NAME _____ DEPT. _____

EMPLOYEE _____ DATE _____

PRINT SIGNATURE

Buckingham Green
4950 Route 202
Building 1 · Suite 2A
Holicong, PA 18928-0615
Tel (215) 794-3535
Fax (215) 794-7353
e-mail: telizabeth@aol.com

Human Factors Applications INCORPORATED

ORDNANCE & EXPLOSIVE WASTE REMEDIATION

GENERAL LIABILITY, PROPERTY DAMAGE, AND LOSS REPORT

DIVISION/SUBSIDIARY _____ CENTER NO. _____ DATE / /

ADDRESS _____

HOW DID DAMAGE OR LOSS OCCUR: _____

_____

_____

DESCRIPTION OF DAMAGE OR LOSS: _____

_____

_____

IDENTIFICATION OF DAMAGED OR LOST PROPERTY: _____

_____

LOCATION OF DAMAGED OR LOST PROPERTY (Before Loss): _____

_____

DATE AND TIME OF DAMAGED OR LOST PROPERTY: Date / / Time _____ AM PM

OWNER OF DAMAGE OR LOST PROPEPERTY:

Name _____ Phone No. _____

Address _____ City _____

Employer _____

INJURED PARTIES (Complete also a Supervisors Employee Injury Report

1. Name _____ Phone No. _____
   Address _____ City _____
   Employer's Name & Address _____
2. Name _____ Phone No. _____
   Address _____ City _____
   Employer's Name & Address _____

WITNESSES:

1. Name _____ Phone No. _____
   Address _____ City _____
   Employer's Name & Address _____
2. Name _____ Phone No. _____
   Address _____ City _____
   Employer's Name & Address _____

WERE PICTURES TAKEN ☐ YES ☐ NO

WERE POLICE NOTIFIED ☐ YES ☐ NO DEPT. _____

EMPLOYEE _____ _____ Date / /
Print Name Signature

MANAGER _____ _____ Date / /
Print Name Signature

Medical Treatment:

The following are generally considered medical treatment. Work-related injuries for which this type of treatment was provided or should have been provided are almost always recordable:

- Treatment of INFECTION
- Application of ANTISEPTICS during second or subsequent visit to medical personnel
- Treatment of SECOND OR THIRD DEGREE BURN(S)
- Application of SUTURES (stitches)
- Application of BUTTERFLY ADHESIVE DRESSING(S) or STERI STRIP(S) in lieu of sutures
- Removal of FOREIGN BODIES EMBEDDED IN EYE
- Removal of FOREIGN BODIES FROM WOUND; if procedure is COMPLICATED because of depth of embedment, size, or location
- Use of PRESCRIPTION MEDICATIONS (except a single dose administered on first visit for minor injury of discomfort)
- Use of hot or cold SOAKING THERAPY during second or subsequent visit to medical personnel
- Application of hot or cold COMPRESS(ES) during second or subsequent visit to medical personnel
- CUTTING AWAY DEAD SKIN (surgical debridement)
- Application of HEAT THERAPY during second or subsequent visit to medical personnel
- Use of WHIRLPOOL BATH THERAPY during second or subsequent visit to medical personnel
- POSITIVE X-RAY DIAGNOSIS (fractures, broken bones, etc.)
- ADMISSION TO A HOSPITAL or equivalent medical facility FOR TREATMENT.

First Aid Treatment:

The following are generally considered first aid treatment (e.g., one-time treatment and subsequent observation of minor injuries) and should not be recorded if the work-related injury does not involve loss of consciousness, restriction of work or motion, or transfer to another job:

- Application of ANTISEPTICS during first visit of medical personnel
- Treatment of FIRST DEGREE BURN(S)
- Application of BANDAGE(S) during any visit to medical personnel
- Use of ELASTIC BANDAGE(S) during first visit to medical personnel
- Removal of FOREIGN BODIES NOT EMBEDDED IN EYE if only irrigation is required
- Removal of FOREIGN BODIES FROM WOUND; if procedure is UNCOMPLICATED, and is, for example, by tweezers or other simple technique
- Use of NONPRESCRIPTION MEDICATIONS AND administration of single doses of PRESCRIPTION MEDICATION on first visit for minor injury or discomfort
- SOAKING THERAPY on initial visit to medical personnel or removal of bandages by SOAKING
- Application of hot or cold COMPRESS(ES) during first visit to medical personnel
- Application of OINTMENTS to abrasions to prevent drying or cracking
- Application of HEAT THERAPY during first visit to medical personnel
- Use of WHIRLPOOL BATH THERAPY during first visit to medical personnel
- NEGATIVE X-RAY DIAGNOSIS
- OBSERVATION of injury during visit to medical personnel.

The following procedure, by itself, is not considered medical treatment:

- Administration of TETANUS SHOT(S) or BOOSTER(S). However, these shots are often given in conjunction with more serious injuries; consequently, injury requiring these shots may be recordable for other reasons.

Loss of consciousness. If an employee loses consciousness as the result of a work-related injury, the case must be recorded nor matter what type of treatment was provided. The rationale behind this recording requirement is that loss of consciousness is generally associated with the more serious injuries.

Restriction of work or motion. Restricted work activity occurs when the employee, because of the impact of a job-related injury, is physically or mentally unable to perform all or any part of his or her normal assignment during all or any part of the workday or shift. The emphasis is on the employee's ability to perform normal job duties. Restriction of work or motion may result in either a lost worktime injury or a nonlost-worktime injury, depending upon whether the restriction extended beyond the day of injury.

Transfer to another job. Injuries requiring transfer of the employee to another job are also considered serious enough to be recordable regardless of the type of treatment provided. Transfers are seldom the sole criterion for recordability because injury cases are almost always recordable on other grounds, primarily medical treatment or restriction of work or motion.

ENVIRONMENTAL SITE CONDITIONS SURVEY REPORT

PROJECT:	CONTRACT NO:
DELIVERY ORDER #:	DATE:
UXO PROJECT LEADER:	SIGNATURE:

GENERAL SITE DESCRIPTION:

A. TREES:

B. SHRUBS & GRASSES:

C. ON/OFF-SITE DRAINAGE:

C. ACCESS/HAUL ROADS:

E. DRAIN CULVERTS:

F. FENCING:

G. PREEXISTING REFUSE/DEBRIS:

ON-SITE SAFETY MEETING RECORD

PROJECT NAME: _____ JOB NO: _____

DATE: _____ TIME: _____ LOCATION: _____

REASON FOR MEETING: (check all that apply)

[] Initial site safety briefing.
[] Beginning of new task. Task: _____
[] Periodic safety meeting.
[] New site procedures.
[] New site information.
[] Review of site incident.
[] Other (explain) _____

_____ _____

MEETING ATTENDEES:

	Name	Affiliation
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

ON-SITE SAFETY MEETING RECORD

PROJECT NAME: _____ JOB No: _____

DATE: _____ TIME: _____ LOCATION: _____

SAFETY TOPICS PRESENTED:

[] Site Safety Personnel
[] Site Description
[] Work Area Description
[] Site Characterization
[] Work Area Characterization
[] Chemical Hazard Evaluation
[] Physical Hazard Evaluation
[] Toxicological Review
[] Heat Stress
[] Cold Stress
[] Site Layout and Control Measures
[] Work Zones
[] Personnel Protective Equipment
[] Air Monitoring
[] Safe Work Practices - General
[] Decontamination Procedures
[] Emergency Response Plan
[] Emergency Response Personnel
[] On-site Emergency
[] Off-site Emergencies
[] Site Evacuation Procedures
[] Work Area Evacuation Procedures
[] Places of Refuge
[] Emergency Decontamination
[] Emergency Equipment
[] Emergency Telephone Numbers
[] Directions to Hospital
[] Medical Monitoring
[] Training
[] Safe Work Practices - Task

Other Topics or Notes: _____

_____

_____

_____

_____

NAME OF PRESENTER: _____

TITLE OF PRESENTER: _____

SIGNATURE: _____ DATE: _____

Contract Number: _____ Delivery Order Number: _____

HEA PRICE QUOTATION WORKSHEET

Generic Description of Item/Use: _____

_____

_____

_____

_____

Quantity: _____

QUOTES

1. Vendor: _____ Item: _____

   Sales Rep: _____ Phone Number: _____

   Quoted Price: _____ Quote Date: _____

   Terms: _____

2. Vendor: _____ Item: _____

   Sales Rep: _____ Phone Number: _____

   Quoted Price: _____ Quote Date: _____

   Terms: _____

3. Vendor: _____ Item: _____

   Sales Rep: _____ Phone Number: _____

   Quoted Price: _____ Quote Date: _____

   Terms: _____

RECOMMENDATIONS

Human Factors Applications, Inc. Correspondence Log

Date / Number	From	To	Subject

HUMAN FACTORS APPLICATIONS, INC.

TELEPHONE LOG

OFFICE/SITE: _____ *EMPLOYEE:* _____

Phone Number Called From: (___) ___ - _____

DATE 24 HR. TIME	FROM TO	TELEPHONE NO. CALLED	SUBJECT (BE SPECIFIC)

This form is to be used for all calls pertaining to official instructions that could effect operations on site. In addi all long distance and cellular phone calls made from the site are to be recorded on this form. HFA com telephones are to be used only for official business except in emergencies. This form is to be sent to the Holicong office for reconciliation at the end of each month.

(For Safety Staff Only)	REPORT NO	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT (For Use of this Form See Attachment Instructions and USACE Suppl to AR385-40)	REQUIREMENT CONTROL SYMBOL CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	FIRE ☐ INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	FIRE ☐ INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC	☐ FATAL ☐ OTHER		☐	

2. PERSONNEL DATA

a. NAME (Last, First MI)	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER ___ ___ ___ / ___ ___ / ___ ___ ___ ___	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER (Specify) ☐

3. GENERAL INFORMATION

a. DATE OF ACCIDENT (month/day/year) / /	b. TIME OF ACCIDENT (Military time)	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME (2) SUBCONTRACTOR

e. CONTRACT NUMBER ☐ CIVIL WORKS ☐ MILITARY ☐ OTHER (Specify)	f. TYPE OF CONTRACT ☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER (specify)	g. HAZARDOUS/TOXIC WASTE ACTIVITY ☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER (Specify)

4. CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see instructions)

a. CONSTRUCTION ACTIVITY (CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT (CODE)

5. INJURY / ILLNESS INFORMATION (Include name on line and corresponding code number in box from list - see instructions)

a. SEVERITY OF ILLNESS / INJURY (CODE)	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY

e. BODY PART AFFECTED (CODE) PRIMARY (CODE) SECONDARY	g. TYPE AND SOURCE OF INJURY / ILLNESS TYPE (CODE) SOURCE (CODE)
f. NATURE OF ILLNESS / INJURY (CODE)	

6. PUBLIC FATALITY (Fill in the line and corresponding code number in box - see instructions)

a. ACTIVITY AT TIME OF ACCIDENT (CODE)	b. PERSONAL FLOATATION DEVICE USED? ☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	C. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER (Specify)	☐ SIDE SWIPE ☐HEAD ON ☐REAR END ☐ BROADSIDE ☐ ROLLOVER ☐BACKING ☐ OTHER (Specify)	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY /MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL / FLOATING PLANT ACCIDENT (Fill in line and corresponding code and number from list - see instructions)

a. TYPE OF VESSEL/FLOATING PLANT (CODE)	b. TYPE OF COLLISION/MISHAP (CODE)

10. ACCIDENT DESCRIPTION (Use additional paper, if necessary)

11.. CASUAL FACTOR(S) (Read instructions Before Completing

a. (Explain YES answers in item 10)	YES	NO
D. ..N: Was design of facility , workplace or Equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & Maintenance procedures a factor?	☐	☐
PERSONS PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Were any human factors such as size or strength of person, etc. contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc. contribute to the accident?	☐	☐

a. (CONTINUED)	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to Chemical agents such as dust, fumes, mists, vapors or physical agents such as noise, radiation, etc. contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as lifting office Furniture, carrying, stooping, etc. contribute to accident?	☐	☐
SUPPORT FACTORS: were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐

WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT THE TIME OF ACCIDENT?

☐ YES (If yes, attach a copy) ☐ NO

12.. TRAINING

a. WAS PERSON TRAINED TO PERFORMED TASK?	B. TYPE OF TRAINING	c. DATE OF MOST RECENT FORMAL TRAINING
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	/ / (Month) (Day) (Year)

13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT. INCLUDE DIRECT AND INDIRECT CAUSES (See instructions for definition of direct and indirect causes) (Use additional paper, if necessary)

a. DIRECT CAUSE

B. ...RECT CAUSE

14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S)

a. DESCRIBE FULLY:

15. Dates for actions identified in block 14.

a. BEGINNING (Month / Day / Year) / /	b. ANTICIPATED COMPLETION (Month / Day / Year) / /

c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT	d. DATE (Mo/Da/Yr	e. ORGANIZATION IDENTIFIER (Div. Br. Sect>)	f. OFFICE SYMBOL
CORPS _____	____ / ____ / ____		
CONTRACTOR _____	____ / ____ / ____		

16. MANAGEMENT REVIEW (1st)

a. ☐ CONCUR B. ☐ NON CONCUR C. COMMENTS

SIGNATURE	TITLE	DATE

17. MANAGEMENT REVIEW (2nd - Chief Operations, Constructions, Engineering, Etc>)

a. ☐ CONCUR B. ☐ NON CONCUR C. COMMENTS

SIGNATURE	TITLE	DATE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. ☐ CONCUR B. ☐ NON CONCUR C. COMMENTS

SIGNATURE	TITLE	DATE

19 COMMAND APPROVAL

COMMENTS

COMMANDER SIGNATURE	DATE

GENERAL. Complete a separate report for each person who was involved, caused, or contributed to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA Commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16. and 17.

INSTRUCTIONS FOR SECTION 1 — ACCIDENT CLASSIFICATION. *(Mark All Boxes That Are Applicable.)*

a. GOVERNMENT. Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.

(2) PROPERTY DAMAGE — Mark the appropriate box if accident resulted in any damage of $1000 or more to government property (including motor vehicles).

(3) VEHICLE INVOLVED — Mark if accident involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY — Mark if the accident involved an in-house USACE diving activity.

b. CONTRACTOR.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in any contractor lost-time injury/illness or fatality.

(2) PROPERTY DAMAGE — Mark the appropriate box if accident resulted in any damage of $1000 or more to contractor property (including motor vehicles).

(3) VEHICLE INVOLVED — Mark if accident involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY — Mark if the accident involved a USACE Contractor diving activity.

c. PUBLIC.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in public fatality or permanent total disability. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).

(2) VOID SPACE — Make no entry.

(3) VEHICLE INVOLVED — Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS/FATALITY" is marked.

(4) VOID SPACE — Make no entry.

INSTRUCTIONS FOR SECTION 2 — PERSONAL DATA

a. NAME — (MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.

b. AGE — Enter age.

c. SEX — Mark appropriate box.

d. SOCIAL SECURITY NUMBER — (FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).

e. GRADE — (FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: O-6; E-7; WG-8; WS-12; GS-11; etc.

f. JOB SERIES/TITLE — For government civilian employees enter pay plan, full series number, and job title, e.g. GS-0810/Civil Engineer. For *military personnel* enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11GS0. For *contractor employees* enter the job title assigned to the injured person, e.g. carpenter, laborer, surveyor, etc.

g. DUTY STATUS — Mark the appropriate box.

(1) ON DUTY — Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.

(2) TDY - Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.

(3) OFF DUTY - Person was not on official business at time of accident.

h. EMPLOYMENT STATUS — (FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTION FOR SECTION 3 — GENERAL INFORMATION

a. DATE OF ACCIDENT — Enter the month, day, and year of accident.

b. TIME OF ACCIDENT — Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).

c. EXACT LOCATION OF ACCIDENT — Enter facts needed to locate the accident scene. (installation/project name, building number, street, direction and distance from closest landmark, etc.).

d. CONTRACTOR NAME

(1) PRIME — Enter the exact name (title of firm) of the prime contractor.

(2) SUBCONTRACTOR — Enter the name of any subcontractor involved in the accident.

e. CONTRACT NUMBER — Mark the appropriate box to identify if contract is civil works, military, or other; if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.

f. TYPE OF CONTRACT — Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.

g. HAZARDOUS/TOXIC WASTE ACTIVITY (HTW) — Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUDS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 — CONSTRUCTION ACTIVITIES

a. CONSTRUCTION ACTIVITY — Select the *most appropriate* construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

1. MOBILIZATION	14. ELECTRICAL
2. SITE PREPARATION	15. SCAFFOLDING/ACCESS
3. EXCAVATION/TRENCHING	16. MECHANICAL
4. GRADING (EARTHWORK)	17. PAINTING
5. PIPING/UTILITIES	18. EQUIPMENT MAINTENANCE
6. FOUNDATION	19. TUNNELING
7. FORMING	20. WAREHOUSING/STORAGE
8. CONCRETE PLACEMENT	21. PAVING
9. STEEL ERECTION	22. FENCING
10. ROOFING	23. SIGNING
11. FRAMING	24. LANDSCAPING/IRRIGATION
12. MASONRY	25. INSULATION
13. CARPENTRY	26. DEMOLITION

b. TYPE OF CONSTRUCTION EQUIPMENT — Select the equipment involved in the accident from the list below. Enter the name and [illegible] the corresponding code number identified in the box. If [illegible]ment is not included below, use code 24, "OTHER", and write [illegible]ecific type of equipment.

CONSTRUCTION EQUIPMENT

1. GRADER
2. DRAGLINE
3. CRANE (ON YESSEL/BARGE)
4. CRANE (TRACKED)
5. CRANE (RUBBER TIRE)
6. CRANE (VEHICLE MOUNTED)
7. CRANE (TOWER)
8. SHOVEL
9. SCRAPER
10. PUMP TRUCK (CONCRETE)
11. TRUCK (CONCRETE/TRANSIT MIXER)
12. DUMP TRUCK (HIGHWAY)
13. DUMP TRUCK (OFF HIGHWAY)
14. TRUCK (OTHER)
15. FORKLIFT
16. BACKHOE
17. FRONT-END LOADER
18. PILE DRIVER
19. TRACTOR (UTILITY)
20. MANLIFT
21. DOZER
22. DRILL RIG
23. COMPACTOR/VIBRATORY ROLLER
24. OTHER

INSTRUCTIONS FOR SECTION 5 — INJURY/ILLNESS INFORMATION

a. SEVERITY OF INJURY / ILLNESS - Reference para 2-10 of USACE Suppl 1 to AR 385-40 and enter code and description from list below.

NOI NO INJURY
FAT FATALITY
PTL PERMANENT TOTAL DISABILITY
PPR PERMANENT PARTIAL DISABILITY
LWD LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK
NLW RECORDABLE CASE WITHOUT LOST WORKDAYS
RFA RECORDABLE FIRST AID CASE
NRI NON-RECORDABLE INJURY

STIMATED DAYS LOST — Enter the estimated number of workdays the person will lose from work.

c. ESTIMATED DAYS HOSPITALIZED — Enter the estimated number of workdays the person will be hospitalized.

d. ESTIMATED DAYS RESTRICTED DUTY — Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.

e. BODY PART AFFECTED — Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	CB	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW
	CL	THROAT, LARYNX
	CM	MOUTH
	CN	[illegible]
	CR	THROAT, OTHER
	CT	TONGUE
	CZ	HEAD OTHER INTERNAL
ELBOW	EB	BOTH ELBOWS
	ES	SINGLE ELBOW
FINGER	F1	FIRST FINGER
	F2	BOTH FIRST FINGERS
	F3	SECOND FINGER
	F4	BOTH SECOND FINGERS
	F5	THIRD FINGER
	F6	BOTH THIRD FINGERS
	F7	FOURTH FINGER
	F8	BOTH FOURTH FINGERS
TOE	G1	GREAT TOE
	G2	BOTH GREAT TOES
	G3	TOE OTHER
	G4	TOES OTHER
HEAD, EXTERNAL	H1	EYE EXTERNAL
	H2	BOTH EYES EXTERNAL
	HO	EAR EXTERNAL
	H4	BOTH EARS EXTERNAL
	HC	CHIN
	HF	FACE
	HK	NECK/THROAT
	HM	MOUTH/LIPS
	HN	NOSE
	HS	SCALP
KNEE	KB	BOTH KNEES
	KS	KNEE
LEG, HIP, ANKLE, BUTTOCK	LB	BOTH LEGS/HIPS/ ANKLES/BUTTOCKS
	LS	SINGLE LEG/HIP ANKLE/BUTTOCK
HAND	MB	BOTH HANDS
	MS	SINGLE HAND
FOOT	PB	BOTH FEET
	PS	SINGLE FOOT
TRUNK, BONES	R1	SINGLE COLLAR BONE
	R2	BOTH COLLAR BONES
	R3	SHOULDER BLADE
	R4	BOTH SHOULDER BLADES
	RB	RIB
	RS	STERNUM (BREAST BONE)
	RV	VERTEBRAE (SPINE; DISC)
	RZ	TRUNK BONES OTHER
SHOULDER	SB	BOTH SHOULDERS
	SS	SINGLE SHOULDER
THUMB	TB	BOTH THUMBS
	TS	SINGLE THUMB
TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	V2	LUNGS, BOTH
	V3	KIDNEY, SINGLE
	V4	KIDNEYS, BOTH
	VH	HEART
	VL	LIVER
	VR	REPRODUCTIVE ORGANS
	VS	STOMACH
	VV	INTESTINES
	VZ	TRUNK, INTERNAL, OTHER

f. NATURE OF INJURY/ILLNESS - Select the most appropriate nature of injury / illness from the list below. This nature of injury / illness shall correspond to the primary body part selected in 5e. above. Enter the nature of injury / illness name on the line and place the corresponding CODE letters in the box provided.

CODE	SOURCE OF INJURY NAME
0100	ENVIRONMENTAL CONDITION
	TEMPERATURE EXTREME (INDOOR)
	WEATHER (ICE, RAIN, HEAT, ETC.)
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)
0240	NOISE
0250	RADIATION
0260	LIGHT
0270	VENTILATION
0271	TOBACCO SMOKE
0280	STRESS (EMOTIONAL)
0290	CONFINED SPACE
0300	MACHINE OR TOOL
0310	HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320	HAND TOOL (NONPOWERED)
0330	MECHANICAL POWER TRANSMISSION APPARATUS
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350	VIDEO DISPLAY TERMINAL
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370	HEATING EQUIPMENT
0380	WELDING EQUIPMENT
0400	VEHICLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421	DRIVER OF GOVERNMENT VEHICLE
0422	PASSENGER OF GOVERNMENT VEHICLE
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)
0440	AIRCRAFT (NOT COMMERCIAL)
0450	BOAT, SHIP, BARGE
0500	MATERIAL HANDLING EQUIPMENT
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540	HOIST, SLING CHAIN, JACK
0550	CRANE
0551	FORKLIFT
0560	HANDTRUCK, DOLLY
0600	DUST, VAPOR, ETC.
0610	DUST (SILICA, COAL, ETC.)
0620	FIBERS
0621	ASBESTOS
0630	GASES
0631	CARBON MONOXIDE
0640	MIST, STEAM, VAPOR, FUME
0641	WELDING FUMES
0650	PARTICLES (UNIDENTIFIED)
0700	CHEMICAL, PLASTIC, ETC.
0711	DRY CHEMICAL—CORROSIVE
0712	DRY CHEMICAL—TOXIC
0713	DRY CHEMICAL—EXPLOSIVE
0714	DRY CHEMICAL—FLAMMABLE
0721	LIQUID CHEMICAL—CORROSIVE
0722	LIQUID CHEMICAL—TOXIC
0723	LIQUID CHEMICAL—EXPLOSIVE
0724	LIQUID CHEMICAL—FLAMMABLE
0730	PLASTIC
0740	WATER
0750	MEDICINE
0800	INANIMATE OBJECT
0810	BOX, BARREL, ETC.
0820	PAPER
0830	METAL ITEM, MINERAL
0831	NEEDLE
0840	GLASS
0850	SCRAP, TRASH
0860	WOOD
0870	FOOD
0880	CLOTHING, APPAREL, SHOES
0900	ANIMATE OBJECT
0911	DOG
0912	OTHER ANIMAL
0920	PLANT
0930	INSECT
0940	HUMAN (VIOLENCE)
0950	HUMAN (COMMUNICABLE DISEASE)
0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE	SOURCE OF INJURY NAME
1000	PERSONAL PROTECTIVE EQUIPMENT
1010	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020	RESPIRATOR, MASK
1021	DIVING EQUIPMENT
1030	SAFETY BELT, HARNESS
1040	PARACHUTE

INSTRUCTIONS FOR SECTION 6 — PUBLIC FATALITY

a. ACTIVITY AT TIME OF ACCIDENT — Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the most appropriate primary activity area (water-related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

1. Sailing
2. Boating—powered
3. Boating—unpowered
4. Water skiing
5. Fishing from boat
6. Fishing from bank dock or pier
7. Fishing while wading
8. Swimming/supervised area
9. Swimming/designated area
10. Swimming/other area
11. Underwater activities (skin diving, scuba, etc.)
12. Wading
13. Attempted rescue
14. Hunting from boat
15. Other

NON-WATER RELATED RECREATION

16. Hiking and walking
17. Climbing (general)
18. Camping/picnicking authorized area
19. Camping/picnicking unauthorized area
20. Guided tours
21. Hunting
22. Playground equipment
23. Sports/summer (baseball, football, etc.)
24. Sports/winter (skiing, sledding, snowmobiling etc.)
25. Cycling (bicycle, motorcycle, scooter)
26. Gliding
27. Parachuting
28. Other non-water related

OTHER ACTIVITIES

29. Unlawful acts (fights, riots, vandalism, etc.)
30. Food preparation/serving
31. Food consumption
32. Housekeeping
33. Sleeping
34. Pedestrian struck by vehicle
35. Pedestrian other acts
36. Suicide
37. "Other" activities

b. PERSONAL FLOTATION DEVICE USED — If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7 — MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE — Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.

b. TYPE OF COLLISION — Mark appropriate box.

c. SEAT BELT — Mark appropriate box.

INSTRUCTIONS FOR SECTION 8 — PROPERTY/ MATERIAL INVOLVED

a. NAME OF ITEM — Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.

b. OWNERSHIP — Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE*)

c. $ AMOUNT OF DAMAGE — Enter the total estimated dollar amount of damage (parts and labor), if any.

INSTRUCTIONS FOR SECTION 9 — VESSEL/ FLOATING PLANT ACCIDENT

TYPE OF VESSEL/FLOATING PLANT — Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/ floating plant.

VESSEL/FLOATING PLANTS

1. ROW BOAT
2. SAIL BOAT
3. MOTOR BOAT
4. BARGE
5. DREDGE/HOPPER
6. DREDGE/SIDE CASTING
7. DREDGE/DIPPER
8. DREDGE/CLAMSHELL BUCKET
9. DREDGE/PIPE LINE
10. DREDGE/DUST PAN
11. TUG BOAT
12. OTHER

b. COLLISION/MISHAP — Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

1. COLLISION W/OTHER VESSEL
2. UPPER GUIDE WALL
3. UPPER LOCK GATES
4. LOCK WALL
5. LOWER LOCK GATES
6. LOWER GUIDE WALL
7. HAULAGE UNIT
8. BREAKING TOW
9. TOW BREAKING UP
10. SWEPT DOWN ON DAM
11. BUOY/DOLPHIN/CELL
12. WHARF OR DOCK
13. OTHER

INSTRUCTIONS FOR SECTION 10 — ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT — Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

INSTRUCTIONS FOR SECTION 11 — CAUSAL FACTORS

a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:

(1) DESIGN — Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?

(2) INSPECTION/MAINTENANCE — Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?

(3) PERSON'S PHYSICAL CONDITION — Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?

(4) OPERATING PROCEDURES — Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?

(5) JOB PRACTICES — Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

(6) HUMAN FACTORS — Was the person's [illegible] (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?

(7) ENVIRONMENTAL FACTORS — Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc., play a part in the accident?

(8) CHEMICAL AND PHYSICAL AGENT FACTORS — Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?

(9) OFFICE FACTORS — Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?

(10) SUPPORT FACTORS — Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc?

(11) PERSONAL PROTECTIVE EQUIPMENT — Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?

(12) DRUGS/ALCOHOL — Is there any reason to believe the person's mental or physical capabilities, judgement, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

b. WRITTEN JOB/ACTIVITY HAZARD ANALYSIS — Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. If one was performed, attach a copy of the analysis to the report.

INSTRUCTIONS FOR SECTION 12 — TRAINING

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? — For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

b. TYPE OF TRAINING — Mark the appropriate box that best indicates the type of training; (classroom or on-the-job) that the injured person received before the accident happened.

c. DATE OF MOST RECENT TRAINING — Enter the month, day, and year of the last formal training completed that covered the activity/ task being performed at the time of the accident.

he injury or condition selected below must be caused by a specific cident or event which occurred during a single work day or shift.

NEF ATURE		NATURE OF INJURY
	CODE	NAME
MATIC INJURY OR BILITY	TA	AMPUTATION
	TB	BACK STRAIN.
	TC	CONTUSION; BRUISE; ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
	TQ	TRAUMATIC FOOD POISONING
	TW	TRAUMATIC TUBERCULOSIS
	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC DISEASE
	T1	TRAUMATIC CEREBRAL VASCULAR CONDITION/STROKE
	T2	TRAUMATIC HEARING LOSS
	T3	TRAUMATIC HEART CONDITION
	T4	TRAUMATIC MENTAL DISORDER; STRESS; NERVOUS CONDITION
	T8	TRAUMATIC INJURY — OTHER (EXCEPT DISEASE, ILLNESS)

"A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to to poisons, fumes, etc.; or other continued and repeated ures to conditions of the work environment over a long period of For practical purposes, an occupational illness/disease or ability is any reported condition which does not meet the definition traumatic injury or disability as described above.

ENERAL NATURE		NATURE OF INJURY
ATEGORY	CODE	NAME
"NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY		
RESPIRATORY DISEASE	RA	ASBESTOSIS
	RB	BRONCHITIS
	RE	EMPHYSEMA
	RP	PNEUMOCONIOSIS
	RS	SILICOSIS
	R9	RESPIRATORY DISEASE, OTHER
VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
	VC	COCCIDIOMYCOSIS
	VF	FOOD POISONING
	VH	HEPATITIS
	VM	MALARIA
	VS	STAPHYLOCOCCUS
	VT	TUBERCULOSIS
	V9	VIROLOGICAL/INFECTIVE/ PARASITIC — OTHER
DISABILITY, OCCUPATIONAL	DA	ARTHRITIS, BURSITIS
	DB	BACK STRAIN, BACK SPRAIN
	DC	CEREBRAL VASCULAR CONDITION; STROKE
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES PLS)
	DE	EFFECT OF ENVIRONMENTAL CONDITION
	DH	HEARING LOSS
	DK	HEART CONDITION
	DM	MENTAL DISORDER, EMOTIONAL STRESS NERVOUS CONDITION
	DR	RADIATION
	DS	STRAIN, MULTIPLE
	DU	ULCER
	DV	OTHER VASCULAR CONDITIONS
	D9	DISABILITY, OTHER

GENERAL NATURE CATEGORY	CODE	NATURE NAME
SKIN DISEASE OR CONDITION	SB	BIOLOGICAL
	SC	CHEMICAL
	S9	DERMATITIS, UNCLASSIFIED

9. TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and Source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples:

(1) An employee tripped on carpet and struck his head on a desk.
TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/ oak.
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliver while grinding a turbine blade.
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.
TYPE: 600 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 600, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT BY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0600	TRAVELING IN

CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOILER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

INSTRUCTIONS FOR SECTION 13—CAUSES

a. DIRECT CAUSES—The direct cause is that single factor which most directly lead to the accident. See examples below.

b. INDIRECT CAUSES—Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: failure to provide fall protection at elevation.
Indirect causes: failure to enforce USACE safety requirements; improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.

b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (note USACE vehicle was in proper/safe working condition).
Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.
Indirect cause: Failure of employee to pay attention to driving (defensive driving).

INSTRUCTIONS FOR SECTION 14—ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION—Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15—DATES FOR ACTION

a. BEGIN DATE—Enter the date when the corrective action(s) identified in Section 14 will begin.

b. COMPLETE DATE—Enter the date when the corrective action(s) identified in Section 14 will be completed.

c. TITLE AND SIGNATURE—Enter the title and signature of supervisor completing the accident report. For a GOVERNMENT employee accident/illness the immediate supervisor will complete and sign the report. For PUBLIC accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For CONTRACTOR accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE Supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.

d. DATE SIGNED—Enter the month, day, and year that the report was signed by the responsible supervisor.

e. ORGANIZATION NAME—For GOVERNMENT employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For PUBLIC accidents enter the USACE organization name for the person identified in block 15.c. For CONTRACTOR accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

f. [illegible]
Symbol for the USACE organization identified in block 15.e.

INSTRUCTIONS FOR SECTION 16—MANAGEMENT REVIEW (1st)

1ST REVIEW—Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

INSTRUCTIONS FOR SECTION 17—MANAGEMENT REVIEW (2nd)

2ND REVIEW—The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18—SAFETY AND OCCUPATIONAL HEALTH REVIEW

3RD REVIEW—The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

INSTRUCTION FOR SECTION 19—COMMAND APPROVAL

4TH REVIEW—The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.

SITE SPECIFIC

REMEDIAL ACTION SAFETY PLAN

FOR

FORMER WEST VIRGINIA MANEUVER AREA

DOLLY SODS WILDERNESS AREA

ELKINS, WEST VIRGINIA

FORMER WEST VIRGINIA MANEUVER AREA
DOLLY SODS WILDERNESS AREA
REMEDIAL ACTION SAFETY PLAN

1.1 SITE LOCATION AND DESCRIPTION

1.1.1 The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training and a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit Dolly Sods Wilderness annually. The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

1.1.2 This removal action pertains to 20.89 miles of trails and 101 campsites commonly used in the Dolly Sods Wilderness as designated by the U.S. Forest Service. The total acreage to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111. 9 acres for trails and 2.0 acres for campsites.

1.2 PROJECTED REMOVAL ACTION STARTING DATES

1.2.1 The approximate project start date for Dolly Sods Wilderness Area is as follows:

Establishing Boundaries:	Site boundaries have been decided during previous actions and they are defined in the Scope of Work for this removal project.
Range Clearance Operations:	February 16, 1997
Projected Removal Action:	The projected completion date is July of 1997. The anticipated start date is early in October 1996, with a shut down for the winter. Remobilization at the earliest date, will be in the Spring of 1997.

1.3 SUSPECTED UXO ITEMS

1.3.1 The type of OE contamination located during the 1995 Ordnance Removal Environmental Assessment is listed in Table 1. Additionally this report describes records that "indicate 105mm and 155mm artillery shells were fired during training exercises during World War II." None of these types of UXO have been reported, located or recovered to date on this site.

OE CONTAMINATION
Table - 1

NAME	MODEL/TYPE	QUANTITY
57mm Projectile	Unknown	Unknown
60mm Mortar	HE/Smoke	Unknown
81mm Mortar	HE/Smoke	Unknown
4.2" Mortar	Unknown	Unknown

1.4 HAZARD ASSESSMENT OF MIGRATION OF CONTAMINATION

1.4.1 There is no indication in previous studies conducted in the Dolly Sods Wilderness Area of explosive and heavy metals' contamination. This removal project will not increase the likelihood that contamination or residue is migrating from the site.

1.4.2 The Former West Virginia Maneuver Area is not a suspected HTRW or CWM site. However, if at anytime during site activities, personnel encounter suspect HTRW or CWM personnel will pass the word to evacuate the area either orally or using portable air horns (one long and one short blast). After sounding the alarm, personnel will immediately evacuate the area in an upwind direction, or to a predesignated rally point, and report it to the site Safety Officer. Work will be ceased in that area until the Project Manager, SUXOS, CEHNC Safety Specialist and HFA's Health and Safety Manager has been notified and the situation evaluated. If HTRW has been identified, intrusive investigation will cease until the WP/SSHP has been revised.

1.5 UXO/OE CONTRACTOR

1.5.1 HFA, Inc. has been contracted by the U.S. Army Engineering and Support Center, Huntsville, under contract DACA87-94-D-0019 "Remediation of Various Sites East of the Mississippi River." Task Order 020 has been issued to safely locate, identify, and remove all OE and OE/Non-OE related scrap from selected areas of the Former West Virginia Maneuver Area.

1.6 DEMOLITION OPERATIONS

1.6.1 Demolition safety and operations will be conducted in accordance with the basic practices and procedures outlined in TM 60A 1-1-31 and the appropriate specific 60 Series EOD Publications. UXO will only be detonated after positive identification. Jet Perforators initiated by a detonating cord trunk line or ring main system. A NONEL initiated system will be employed as the method of choice for all detonations. All demolition shots will be tamped as outlined in the work plan. HFA UXO Specialists are experienced and knowledgeable in the use of these charges and have used them successfully during previous projects.

1.6.2 Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an event (such as inclement weather) prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS and the CEHNC Site Safety Specialist are responsible for determining whether minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify the Forest Service Representative and make security arrangements until the UXO can be properly and safely destroyed. HFA personnel will assist the Forest Service personnel if necessary.

1.7 DETONATING UXO IN PLACE

1.7.1 Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1600 hours. All detonations will be conducted according to TM 60A-1-1-31.

1.7.2 Detonations will occur only after all unnecessary personnel have left the area and perimeter security has been established.

1.7.3 The composition of the Demolition Team will be determined by the SUXOS. The team will only be composed of qualified UXO personnel under the direct supervision of a UXOS who is the designated blaster. Additional Demolition Teams may be used at the discretion of the SUXOS if there are large quantities of UXO to detonate.

1.7.4 The remaining HFA UXO personnel may act as perimeter security, as directed by the SUXOS.

1.7.5 Notification of detonations will be made according to the Standard Operating Procedures for Notification of UXO Detonations.

1.7.6 Only Demolitions Team, SUXOS, QC, SSO, and the CEHNC Safety Specialist will be permitted in the area where charges are being assembled and demolition operations are being conducted. However, all of the above authorized personnel should not be in the demolitions operations area simultaneously.

1.7.7 The area where demolition operations are being conducted will remain secured until the "all clear" is given by the SUXOS or SSO.

1.7.8 After each detonation, the detonation points will be inspected by the UXOS and the SUXOS or SSO to ensure that a misfire, low order, or a kick out has not occurred.

1.7.9 All charges will be initiated using NONEL. Detonating cord trunk and branch lines will be used to link multiple shots.

1.7.10 Misfire Procedures

1.7.10.1 According to 29 CFR 1910-109 (e), (4), vi; EM 385-1-1 §29, and 60A 1-1-31, if a misfire occurs, the following general procedures will be strictly followed:

- The SUXOS will be notified of the time of the suspected misfire, and
- The SUXOS will notify the HFA Project Manager (PM), if on site, and the CEHNC Safety Specialist. All other personnel will be notified of the event via radio and instructed to hold their positions until the "all clear" is given. The circumstances surrounding the misfire will be included in the sites Daily Journal [*see Appendix F HFA Forms*].

1.7.10.2 NONEL Misfires

1.7.10.2.1 Another attempt will be made to fire the shot.

1.7.10.2.2 A new primer will be installed in the initiating device and another attempt will be made to fire the shot.

1.7.10.2.3 If the tube is seen to flash or the tube was heard to fire, thirty minutes will lapse before the inspection of a misfire. If it is suspected that the blasting cap is the problem, no attempt will be made to remove or handle the blasting cap. A new charge will be assembled and placed next to the misfired charge and detonated.

1.7.10.3 Detonating Cord Misfires

1.7.10.3.1 A new NONEL system will be attached to the remaining detonating cord, with care taken to fasten it properly, and the original charge will be detonated.

1.7.10.3.2 Branch lines will be treated in the same manner as noted above.

1.7.10.3.3 If detonating cord leading to the charge detonates but fails to function the charge, the following actions will be taken:

- Investigation will not occur until the charges have stopped burning (30 minutes if the charge is buried).
- A new Jet Perforator will be place on the UXO, reprimed and another attempt will be made to detonate the UXO.

1.8 NOTIFICATION

1.8.1 Notification will take place as outlined in the Standard Operating Procedures for Notification of UXO Operations.

1.9 TRANSPORTATION OF UXO/DEMOLITION MATERIALS ON-SITE

1.9.1 Because Dolly Sods is a wilderness area and no motorized vehicles or equipment is allowed in the area, all movement of explosives will be performed by personnel hand carrying or packing the explosives to and from the work area. All explosives will be carried by the SSO and the SUXOS.

1.10 READY SERVICE STORAGE

1.10.1 Because of the nature of the site, explosives will be transported daily to and from the work areas. Explosives will be temporarily stored near the work location. All explosives will be stored in metal containers at least fifty feet from clearance teams.

1.11 TRANSPORTING DEMOLITION MATERIALS FROM STORAGE MAGAZINES

1.11.1 Some transportation of demolitions will be required via vehicle to the trail heads and other points where vehicles are authorized.

1.11.2 All loads will be visually inspected by the SSO to ensure they are properly secured and safe to move. If in his opinion the material is improperly loaded, he shall cause whatever corrective action he deems necessary before he allows the load to move.

1.11.3 When transporting explosives or UXO, vehicles will not exceed the authorized speed limit. In most areas a prudent speed is less than 25 mph, in which case the driver may not exceed a safe and reasonable speed.

1.11.4 Blasting caps and demolition materials are placed in suitable, separate metal containers and separated and sand bagged, to ensure containment of premature function of the blasting caps. The internal space of the container will be padded and the boxes will be separated in the bed of the truck by the largest distance possible. The containers will remain closed always, unless using the materials.

1.11.5 Vehicles hauling UXO will remain covered at all times, unless actually loading or unloading, and a flame resistant tarpaulin or a metal container with a flame resistant lid (such as a metal ammunition box) may be used for this purpose.

1.11.6 Vehicles transporting explosives and UXO will be placarded with a Department of Transportation "Explosives Class 1.1" placard. Class 1.1 consists of explosives that have a mass explosion hazard.

1.12 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS

1.12.1 All explosives and demolition materials will be stored in two ATF approved, portable magazines located on Forest Service property. The magazines will be fitted with approved lightning arrestor and grounding systems as outlined in DOD 6055-9 . The Bell Knob Tower is currently fitted with a lighting arrestor and grounding system. This system will be inspected and repaired(if required) for use during this project.

1.12.2 The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will be responsible for the proper storage, issue, and maintenance of all explosives and explosives' records.

1.12.3 The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will record the location and type of UXO detonated inplace so that information can be included in the final report.

1.13 ESTABLISHMENT OF QUANTITY OF EXPLOSIVES AND FRAGMENTATION DISTANCES

1.13.1 The Dolly Sods Wilderness Area is unsecured and potentially open to the public. The Forest Service will close and mark with signs, the trails and campsites closed to the public during OE operations. UXO Supervisors are responsible for controlling their work zones, stop all work and report unauthorized persons entering their areas. The Forest Service will provide security in controlling access and closing entry points and trail heads where OE operations are on going. The public areas are patrolled by Forest Service personnel and necessary streets and roads will be closed if the situation requires it.

1.13.2 All demolition locations will be confined to the boundaries of the sites. There is not a primary demolition area at this site. Demolition sites will exist where UXOs that cannot be moved are detonated in place. UXO will be destroyed in the position where they are found. The location of UXO that must be detonated in place cannot be predicted, and can occur at any point on the site. All UXO that is detonated in place will be documented and the position indicated on the site map. All demolition shots will be tamped with earth to minimize fragmentation and noise emissions as described in the work plan. The following fragmentation distances are in reference to each individual site where potential OE contamination can be found. This fragmentation distance (944') applies only during intrusive activities and is based on a 4.2" mortar. During actual demolition operations, the fragmentation distance may be reduced based on the type, size, and quantity of OE being disposed of.

1.13.3 Protection of personnel and property are critical elements of any removal operations performed at this site. Because this site is a wilderness area and all materials must be hand carried into and out of the site each day, extensive mechanical engineering controls will not be employed during intrusive activities and/or demolition operations. Earth tamping will be employed to protect structures or persons that may be nearby trail heads. There are no nearby residents nor are there

overhead or underground utilities that require protection. Site personnel will rely on aggressive security measures, an informed public, and audible warning signals to control and perform safe removal and demolition operations.

1.13.4 All explosives and demolition materials will be stored in two ATF approved magazines located on Forest Service Property, at the Bell Knob Tower site. The Bell Knob Tower has a gated entry which controlled and locked at all times. The SUXOS will be responsible for the safe handling of all explosives.

1.13.5 Explosive used for demolition operations will be separated into two magazines. One magazine will hold the detonating cord and the jet perforators and the other magazine will contain the NONEL Initiators. The type, amount, class and net explosive weight (NEW) stored in the Magazine/Explosive Storage Area (MESA) is listed in Table 2.

1.13.6 Based on ATE-P-5400, Explosives Law and Regulations, Table 55.218, the distance in feet to inhabited buildings is 110 feet. The distance in feet to public traffic route is 45 feet. The following distances are in reference to the MESA at Bell Knob Tower, on U S Forest Service property:

- MESA to Public Road (State Road #75) = Approximately 1500 feet.
- MESA to nearest house = Approximately 2 miles.

Note: If a UXO is detonated in place, the safe separation distance to the nearest uninhabited building may be reduced. Additional tamping with sand or sandbags will occur to limit and control the effects of the blast and fragmentation.

1.13.7 Because this site is unsecured, it may be necessary to temporarily close roads and reroute traffic. This will be decided by the proximity of the UXO to the site boundaries, the type, the minimum tamp of UXO, and amount of tamping material (sand/earth) covering the UXO. Local Forest Service personnel will secure public roads, or access routes into the Dolly Sods Wilderness Area. Site control will be maintained by HFA UXO personnel. Road block positions will vary and be coordinated between the CEHNC Safety Specialist, the Forest Service, and HFA SUXOS.

1.14 MAGAZINE REQUIREMENTS

1.14.1 HFA has contracted with a security service for a 24 hours on-site security guard. The magazines will be under constant surveillance. Two portable ATF approved magazines will be used for explosives storage on site. Magazine construction is according to DOD 6055.9 STD. Each door is to be equipped with one of the following locks:

- S&G 833C, Padlock, Key Operated, High Security, Shrouded Shackle,
- S&G 831B, Padlock, Key Operated, High Security, Shrouded Shackle,
- HI SHEAR LK1200, High Security Padlock,

1.14.2 The property where outdoor type magazines are located will be posted with signs reading "EXPLOSIVES - KEEP OUT," in letters not less than three inches high on a reflective surface. The signs will be located to reduce the possibility of a bullet traveling in the direction of the magazine if anyone should shoot at the sign. A hazard identification for fire fighting personnel (showed by a distinctive symbol to be recognized by the fire fighters approaching the fire scene) will be the only sign displayed. For identifying the symbol from long range, the symbol shape is as follows: Octagon shape with an orange background, 10" high by 2" thick black number one, and with each side of the octagon 10" in length. Class One (explosive) Division 1.1 placards as prescribed by the U.S. Department of Transportation in Title 49 CFR Parts 171 - 180, and 390 - 397, will not be placed on the outside the magazines.

1.14.3 Packages of explosives stored within the magazine shall be laid flat with top up on wooden pallets. Corresponding grades or brands shall be stored together in such a manner that brands/grade marks show. They can be easily counted, checked, and stacked in a stable manner. Packages of explosives shall not be unpacked or repacked in a magazine nor within 50 feet of a magazine. Tools used for opening packages of explosives shall be constructed of nonsparking materials. Open packages of explosives shall be securely closed before being returned to the magazine.

1.14.4 Smoking, matches, open flames, spark-producing devices, and firearms shall not be permitted inside or within 50 feet of magazines. The land surrounding the magazines shall be kept clear of all combustible materials for a distance of at least 25 feet. Combustible materials shall not be stored within 50 feet of magazines.

1.15 LIGHTNING PROTECTION

1.15.1 It is required by DOD 6055.9 to install lightning protection on buildings and structures used for processing, handling, or storage of explosives, ammunition, explosive ingredients, and other hazardous materials, particularly where operations cannot be shut down during electrical storms or in areas with more than five thunderstorm days per year.

1.15.2 HFA will install some lightning protection systems that conform to the standards of DOD 6055.9, DOD 4145.26M and National Fire Protection Association (NFPA) Standard No. 78.

1.15.3 There are four types of lightning protection systems acceptable for the protection of structures housing ammunition and explosives. HFA will use the currently installed system on the Bell Knob Tower if after inspection it proves satisfactory. Use of Bell Knob Tower system is equal to a Separately Mounted Shielding System (Mast Type). If the current Bell Knob Tower system is unsatisfactory, HFA will install an appropriate Separately Mounted Shielding System (Mast Type).

1.15.3.1 If a separate system is required it will be constructed as follows:

1.15.3.1.1 A metal pole will be used, the pole will act as both the down conductor and a ground. Air terminals need not be provided for this type of system and if the resistance of the pole to ground is 10 ohms or less, additional grounding is unnecessary. When the resistance exceeds 10 ohms, additional grounding rods will be installed and the ground connection will be securely fastened to the metal pole and the ground rod.

1.15.3.2 If a ground rod is necessary, it will be driven approximately six feet from the base of the pole. The grounding rod will be ten feet long, 3/4 inch solid steel or copper driven into the ground, with the top of the grounding rod at least one foot below the surface. If the resistance to ground of this rod is more than 10 ohms, additional rods will be installed no closer than 10 feet from the first rod.

1.15.4 Testing - After the system is installed, it will be tested and inspected according to the following schedule and standards:

1.15.4.1 Seven-Month Test - The lightning protection system shall be inspected visually every seven months for evidence of corrosion or broken wires or loose connections. All repairs will be made immediately.

1.15.4.2 Fourteen-Month Test - The lightning protection system shall be tested electrically every 14 months to afford testing of the system during all seasons. The test shall be conducted according to the appropriate instrument manufacturer's instructions, by personnel familiar with lightning protection systems.

1.15.4.3 Test Equipment - Only instruments designed for earth-ground system testing are acceptable. The instrument can measure 10 ohms plus or minus 10 percent for ground resistance testing, and one ohm plus or minus 10 percent for bonding testing. The most recent test results will be kept on file.

Table - 2
Demolition Explosives

Description	Class/Division	Quantity	NEW	Storage Compatibility Group
NONEL Shock Tube & Initiators	1.1B	5000 Ft.	Less than 10lb	B
Jet Perforators (Shape Charge)	1.4S	80 ea	6.0lbs	D
Detonating Cord (80 gr. per foot)	1.1	1000 ft	7.0lbs	D

Table - 3
Inhabited Building and Public Traffic Route Distances
Class 1, Division 1

NEW		Distance in Feet to Inhabited Building from II Magazine Type		Distance in Feet to Public Traffic Route from II Magazine Type	
Over	Not Over	Barricaded	Barricaded	Barricaded	Barricaded
10lbs	20lbs	110	95	95	90

1.16 HAZARDOUS ASSESSMENT AND MITIGATION

1.16.1 Precautions to be taken if hazardous, toxic, and radioactive waste or chemical warfare materials are encountered are according to the Site-Specific Safety and Health Plan, Section 2.

1.16.2 The only known contamination with respect to the site might be the explosive residue from demolition materials and explosive fillers from the UXOs. The migration of any explosive residue contamination is not anticipated and will not be sample for.

1.17 OFF-SITE DISPOSAL PLAN

1.18 No off-site disposal will take place during this Task Order.