US Army Corps
of Engineers
HUNTSVILLE DIVISION

Explosive Safety Submission

Ordnance Removal Action
at the
Dolly Sods Wilderness Area
and Dolly Sods North,
West Virginia

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Prepared by
US ARMY CORPS OF ENGINEERS
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1. INTRODUCTION

This Explosive Safety Submission for the Dolly Sods Wilderness Area and Dolly Sods North has been prepared on behalf of the U.S. Forest Service. It outlines the safety aspects of the plan for cleanup of Unexploded Ordnance (UXO) and Ordnance and Explosives (OE) on property formerly owned by the Department Of Defense (DoD). The Dolly Sods Wilderness Area and Dolly Sods North are adjacent pieces of property owned by the U.S. Forest Service. This property made up the Former West Virginia Maneuver Area, which is now a Formerly Used Defense Site (FUDS). UXO/OE has been found and presents an imminent and substantial endangerment to the public that makes use of these lands. The current Action Memorandum addresses the removal action (RA) for the Wilderness Area, but a revised Action Memorandum is currently being prepared to address the Dolly Sods North area. The cleanup alternative for the Dolly Sods North is intended to be the same as the Wilderness Area. It is the intent of the U.S. Army Corps of Engineers, to have the same contractor that will conduct the RA in the Wilderness Area, to also conduct the RA in the Dolly Sods North Area. These RA's will be done back-to-back during the same season.

2. SITE DESCRIPTION

This section describes the site location and history, the occurrence of OE, the area surrounding the site, and the projected future land use for the site.

2.1 Site Location and History

The Dolly Sods Wilderness and Dolly Sods North consist of 10,215 acres and approximately 5,000 acres, respectively, within the Monongahela National Forest in Grant, Tucker and Randolph Counties in east-central West Virginia. The site is bordered by private property to the north and west (Cabin Mountain) and Forest Service land to the east (Bell Knob) and south.

Due to the need for immediate training during World War II, the Secretary of War leased the area on 6 August 1943 from private companies and used it for approximately a two year period for maneuvers and as an artillery and mortar target area for the Thirteenth Army Corps of the Third Army. The area was also used for a few months by the Office of Scientific Research and Development to test fire rockets and projectiles. The Dolly Sods Wilderness is now operated by the Forest Service and is open to the public for hiking, camping, picnicking and hunting. Having been designated by Congress as a "Wilderness", the area is Federally protected. Dolly Sods North, which includes Blackbird Knob (a former target site now used as a recreation area), was privately owned until recent years when it was purchased by the Nature Conservancy and given to the Forest Service in 1992.

Although areas were searched and cleared following WW II by military Explosive Ordnance Disposal (EOD) teams, at least three 81 mm mortar shells have been found in recent years by the public in Dolly Sods Wilderness and at least 4 in the vicinity of Blackbird Knob. It has been reported that 105 mm shells have also been found in the area. The U. S. Army Corps of Engineers

conducted a Feasibility Study in 1991 and concluded that a hazard to the public exists. Remains of 4.2", 57 mm, 60 mm and 81 mm high explosive and smoke rounds were found.

2.2 Occurrence of OE

Portions of the site are known former target areas for 81 mm, 105 mm and 155 mm artillery as well as for field maneuvers. Due to the expedited nature of the acquisition and former use of this property, exact records were either not kept or lost/destroyed. Live ordnance is still being found and removed from the area by the public creating a hazardous situation. Seven such instances have been recorded; however, unofficial reports exist of additional instances of ordnance having been found and removed by hikers and hunters.

No Chemical Warfare Materials (CWM) are suspected at this site. The contractor will positively identify all rounds uncovered before items are removed or destroyed. If a CWM is encountered, the Site Safety Officer will stop all operations on site and notify the USAESC, Huntsville, Project Manager for further instructions.

2.3 Description of Surrounding Area

The site is an undeveloped area of high elevation with windswept plains on the Allegheny Plateau. The terrain is rocky and rugged and the plant and animal life is comparable to that found in northern Canada. Notable features include Red Creek and its tributaries, Breathed Mountain, Blackbird Knob, other knobs and the "sods" or bogs in the level parts of the wilderness. Animal

life is diverse with the only known endangered species being the Cheat Mountain Salamander and, possibly, the Northern Virginia Flying Squirrel. There are also areas of archaeological significance and sensitive plant life.

2.4 Future Land Use

The use of this site will continue as it has been. This is as a wilderness area, open to the public for hiking, camping picnicking, hunting and general recreation.

3. OE REMOVAL

This section presents information concerning the investigation process to this point in time and proposed remediation efforts. It includes a discussion of prior investigations and proposed OE removal methods and procedures.

3.1 PREVIOUS INVESTIGATIONS

Shortly after operations ended at the Maneuver Area, the artillery range was searched and discovered ordnance destroyed. After hikers continued to find isolated ordnance, military EOD teams again searched the area and destroyed ordnance. However the extent of these efforts is not known and ordnance continues to be discovered by the public and reported to the Forest Service or local sheriffs. In addition to the 7 recorded incidences of recovered ordnance, there are unofficial reports of ordnance found and removed by hikers and hunters.

As part of the Defense Environmental Restoration Program, formerly used defense sites were investigated nationwide by the

Corps of Engineers. As a result of this investigation, the Corps conducted the 1991 Feasibility Study. The study included searching a sampling of areas considered to most likely have been used as targets or contain overshots or undershots. A total of 281 acres were searched with magnetometers. Thirteen pieces of ordnance were found from 6 to 24 inches beneath the surface. One piece of ordnance was found within several feet of a site used as a campfire pit. It was concluded that further remediation of the site is needed to reduce the risk to the public. It was also concluded that further study was needed of endangered species habitats and means to protect them and of steps to preserve the archaeological value of the area.

To accomplish this the "Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment" was prepared in 1995. Means to protect endangered species, their habitat, and archaeologically significant areas were established during the Environmental Assessment (EA) process. A Finding of No Significant Impact was signed by the Commander of the Corps of Engineers, Huntington District and the Supervisor of the Monongahela National Forest in September of 1995. Also more detailed operational instructions, designed to protect the Cheat Mountain Salamander, have been prepared jointly by the U.S. Fish and Wildlife Service and the Corps of Engineers.

A risk assessment, using an approach designed specifically for formerly used defense sites containing ordnance, was performed in 1995 for the Wilderness. It was further concluded by the Forest Service and the Corps that Dolly Sods North has almost identical

conditions as the Wilderness and that the alternatives considered and conclusions of the Wilderness' EA and Risk Analysis are also applicable to it. Subsequently the Wilderness's EA, Risk Analysis, and operational instructions were adopted for the entire site.

The risk of accidental detonation of any remaining ordnance, if not addressed, represents a substantial endangerment to public welfare and the environment.

3.2 PROPOSED ACTIONS

Three alternatives were evaluated for the Dolly Sods Wilderness - (1) No Action, (2) clear hiking trails (20.8 miles) and 20 feet on each side to a depth of one foot, and (3) clear camping areas (101) to a depth of four feet and trails as in alternative 2. For each alternative, the remaining risk to the public was evaluated using methodology specifically developed for the Corps of Engineers to assess sites containing UXO. Risk is evaluated based on the potential for an individual to come within the immediate proximity of UXO and the potential consequences. A comparison of the alternatives considered for the Wilderness is provided in the following table, assuming continued high use of the area by the public. (Exposure is defined as a member of the public being present in the immediate proximity to UXO.)

Alt.	Area Remediated (acres)	Projected Exposures	Risk Reduction	Costs
1	None	1258/year	None	None
2	103.7	659/year	47.6%	$1.23M
3	105.2	517/year	58.9%	$1.29M

Comparable alternatives were also evaluated for Dolly Sods North: (1) No Action, (2) clear 23 miles of trails and 20 feet on each side (114.3 acres) and 98.9 acres of open land on Blackbird Knob to a depth of 1 foot, and (3) clear 75 camping areas (1.1 acres), 3 cabin sites (1.5 acres), and 1 trailer dump site (0.5 acres) to a depth of 4 feet and the trails and Blackbird Knob as in alternative 2. The risk reduction percentages for the Wilderness' alternatives are considered to be applicable for these alternatives for Dolly Sods North as indicated in the following table.

Alt.	Area Remediated (acres)	Risk Reduction	Costs
1	None	None	None
2	213.1	47.6%	$2.53M
3	216.2	58.9%	$2.65M

The areas described in alternatives 2 and 3 will be searched by UXO specialists using hand held ordnance detection devices such as metal detectors. If metal is indicated, the area will be excavated by hand to the given depth. Small undergrowth, grasses, and fallen trees will be cleared only if necessary to search an area and only if the area is accessible to hikers, campers, or hunters. Earth will be excavated only if metal objects are detected. Discovered UXO will be destroyed in place or in designated areas by detonation. Before any onsite work commences, trained personnel will work closely with the U.S. Forest Service and the Department of Natural Resources to define potential archaeologically significant areas, sensitive plants, and animal habitats that must be protected and to establish steps to avoid or minimize impacts. Prior to any excavation or detonation, the impacted area will be investigated and endangered or threatened plants and animals removed and archaeologically significant items removed or protected. Disturbed areas will be covered with leaves and other materials found in the area to minimize exposure to the elements.

As noted in the previous tables, remediation alternatives 2 and 3 will reduce the risk of exposures by a projected 47.6% and 58.9% respectively. Lessons learned from other sites indicate that searching and clearing areas outside of the established trails, campgrounds, and open areas will be unfeasible due to the large area, terrain, and costs.

For recommended alternative 3, the Corps plans to commence work in May 1997 and complete all work within seven months. The total

estimated cost is $3.66 million for alternative 2 and $3.94 million for alternative 3.

Popularity of the area is steadily increasing. Consequently, the potential for accidental detonation of ordnance and subsequent injury to or death of members of the public will increase as use of the area increases. In this project there are no practical alternatives to manually searching the areas and detonation in place. It is not safe to move UXO.

3.3 OUTSTANDING POLICY ISSUES

Before any onsite work commences, trained personnel will work closely with the U.S. Forest Service and the Department of Natural Resources to define archaeologically significant areas, sensitive plants, and animal habitats that must be protected and to establish steps to avoid or minimize impacts. These steps and procedures will be explained in a workplan.

3.4 UXO OPERATIONS

Appendix B contains two excerpts from the Work Plan which discuss the conduct of UXO Operations for this project.

3.5 SITE CONTROL

Appendix B contains a third excerpt which briefly discusses Site Control concerns and measures to be employed.

4.0 HEALTH AND SAFETY

Appendix C contains excerpts from the approved work plan that address health and safety procedures during OE clearance

activities at this site.

5.0 SCHEDULE

Work is anticipated to start in early March of 1997 and will begin with vegetation removal and progress to intrusive work.

6.0 REFERENCES

a. AR 385-64, Ammunition and Explosives Safety Standards, dtd 22 May 1987

b. AR 385-64 (Draft), US Army Explosives Safety Program

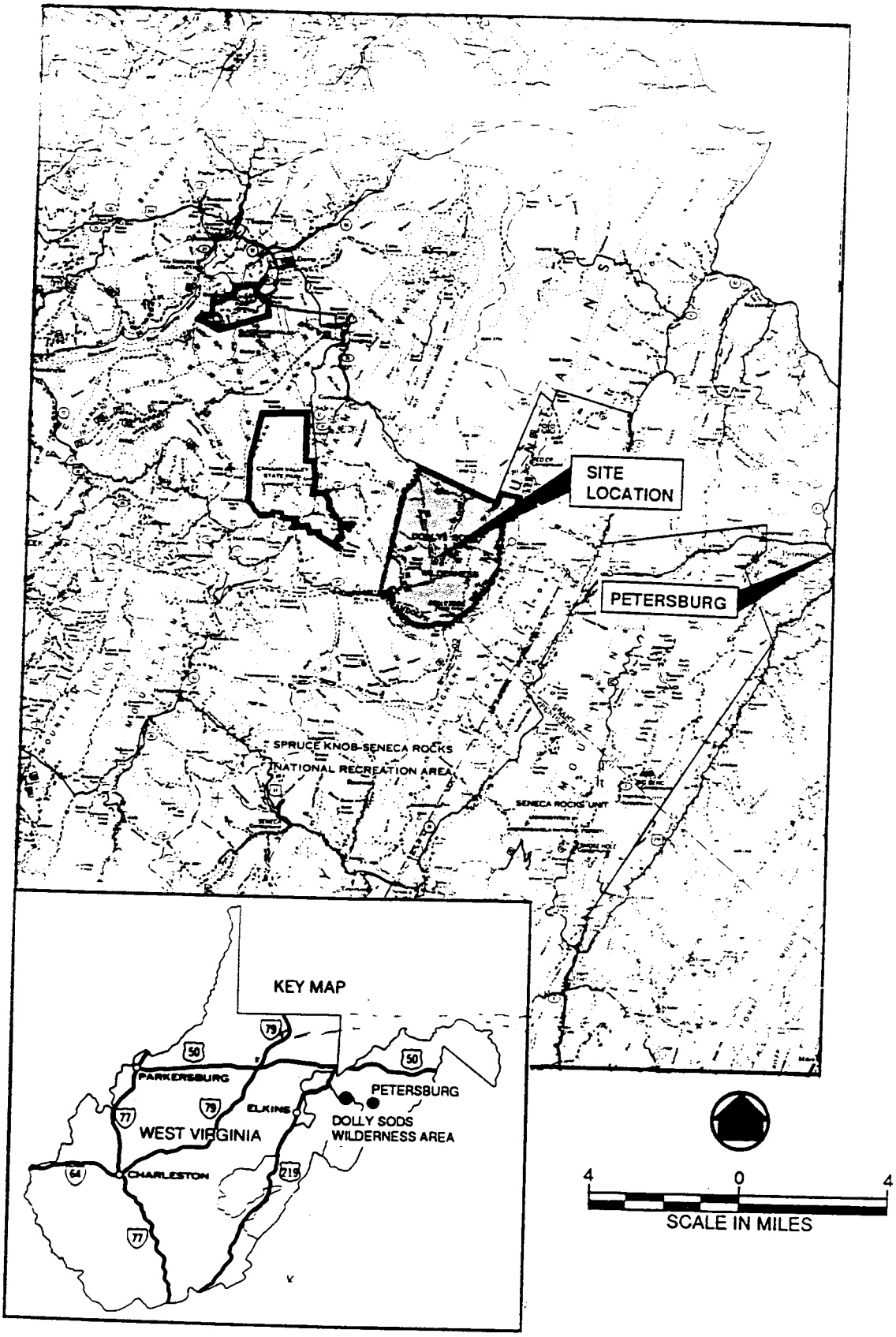
c. Army Explosives Safety Policy on OE Cleanup (Draft)

d. Action Memorandum, Former West Virginia Maneuver Area Near Davis, West Virginia, US Army Engineering and Support Center, Huntsville.

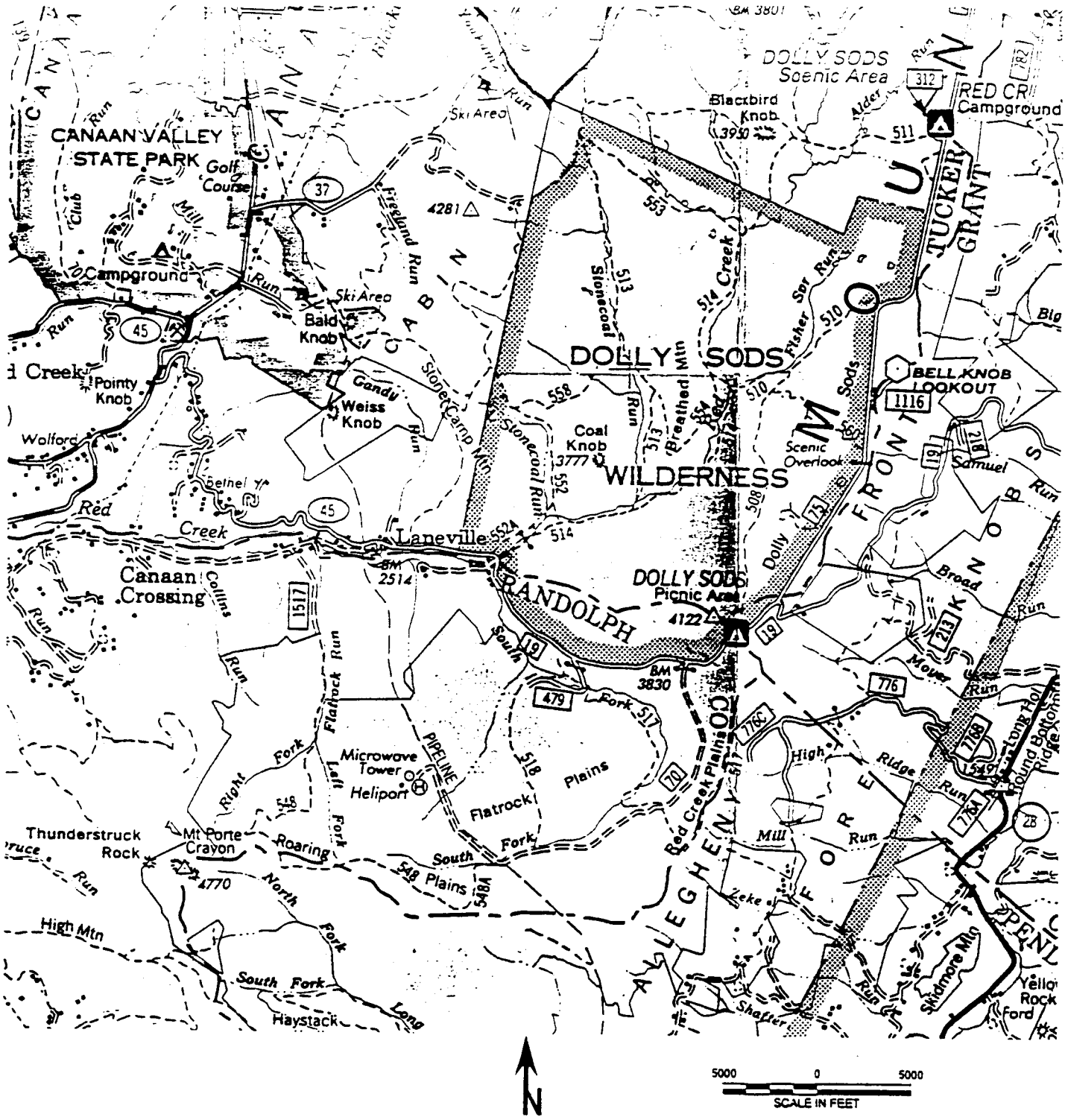
e. Department of Defense Explosives Safety Board, Interim Guidance on Land Clearance Planning and Removal Depth for Ammunition and Explosives. 1993.

APPENDIX A

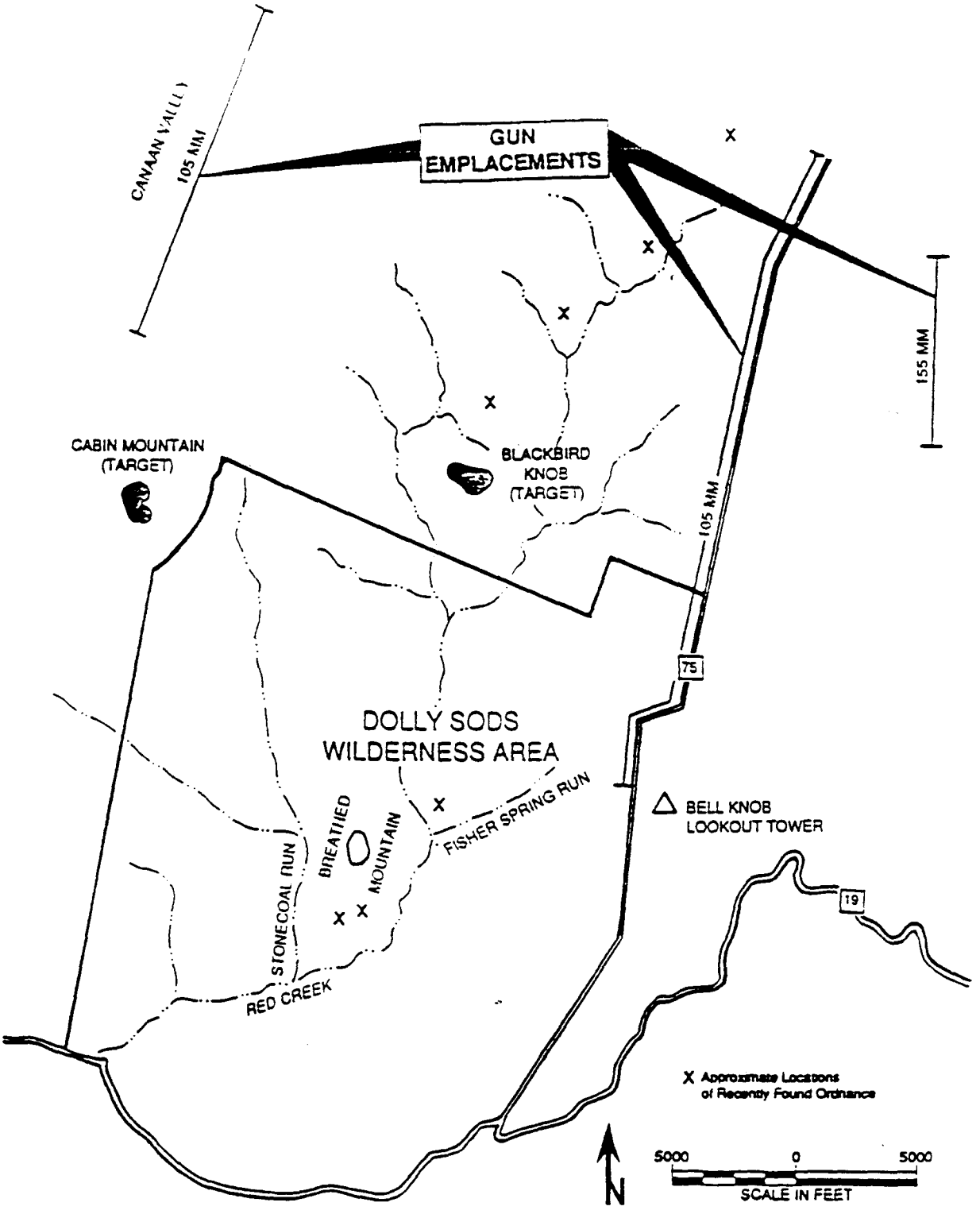
MAPS



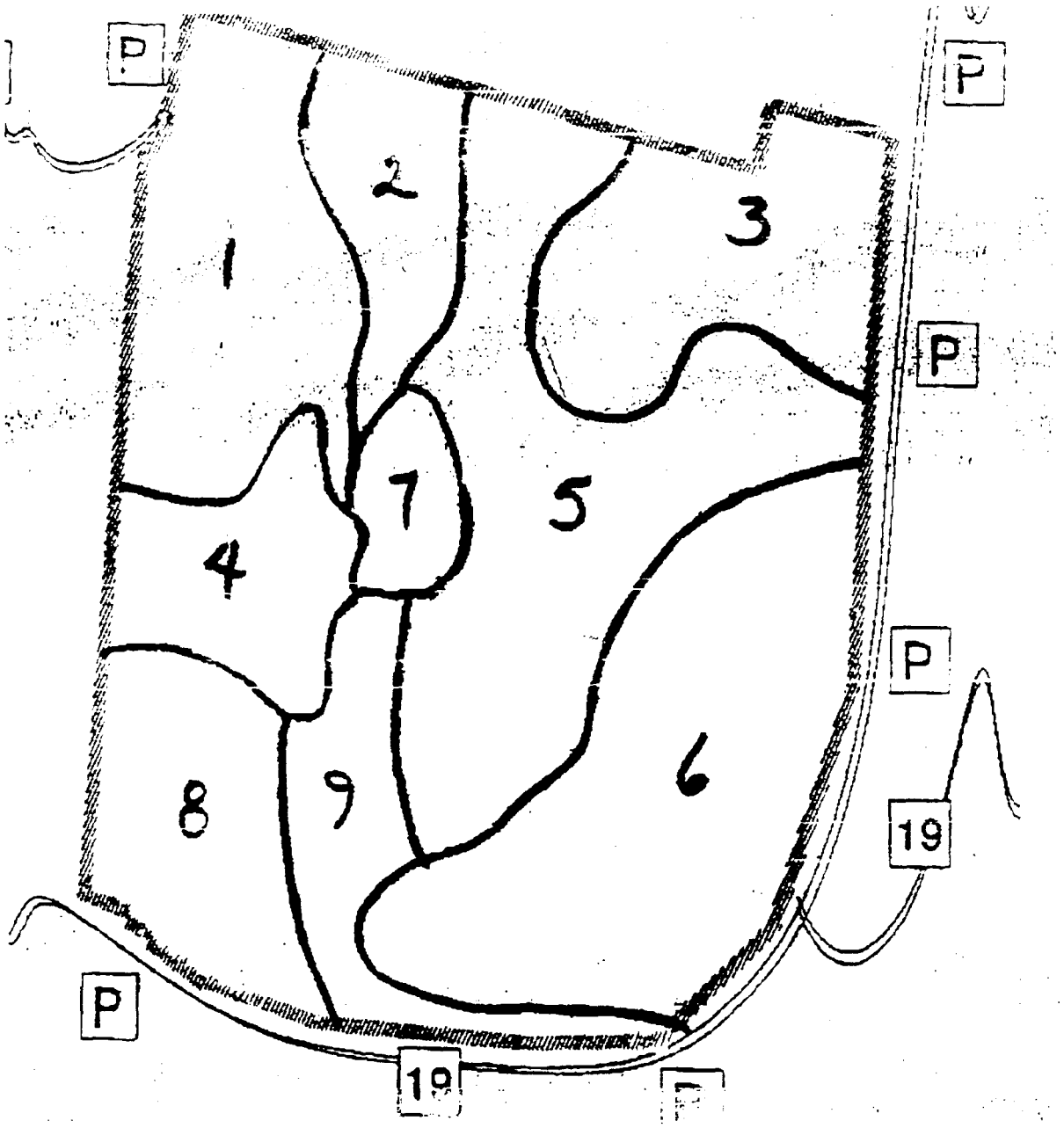
DOLLY SODS WILDERNESS AREA
SITE LOCATION PLAN



General location of the Dolly Sods Wilderness.

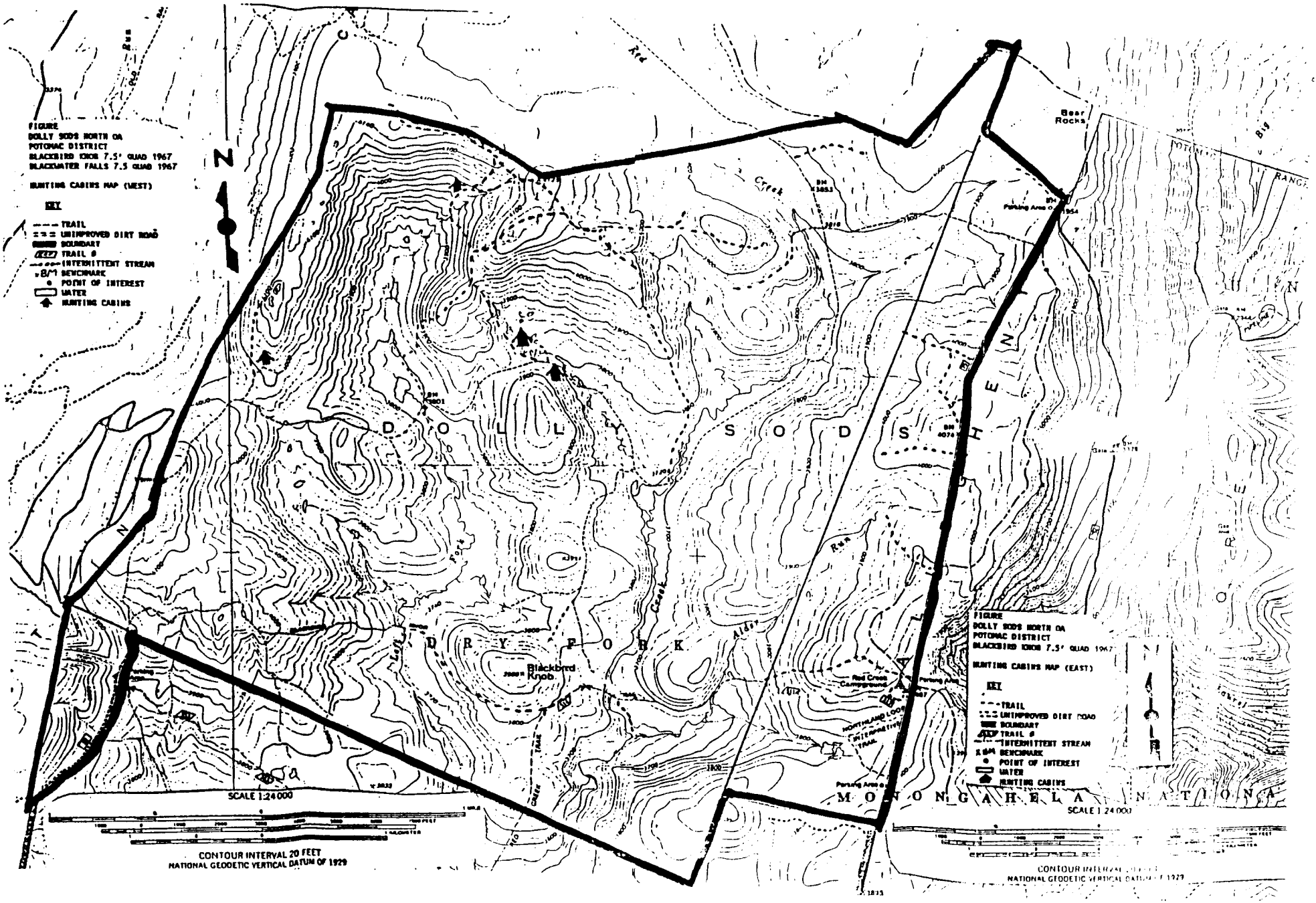


Firing locations and general target areas at Dolly Sods.



Area	Total Acreage (Acres)	# Campsites	Miles of Trails (Miles)	Maximum Clearance Acreage Campsites (Acres)	Maximum Clearance Acreage Trails (Acres)	Clearance Depth Campsites (Feet)	Clearance Depth Trails (Feet)
1	1,648	4	2.35	0.6	12.8	4	1
2	735	2	1.05	0.03	5.7	4	1
3	1	1	0.44	0.01	2.4	4	1
4	767	5	1.63	0.07	8.9	4	1
5	1,565	41	7.88	0.60	43.0	4	1
6	2,156	21	3.34	0.30	18.2	4	1
7	282	5	0.69	0.07	3.8	4	1
8	1,192	15	2.50	0.22	13.6	4	1
9	819	7	1.01	0.10	5.5	4	1

Descciption of Areas and Proposed Clearance Activities



DOLLY SODS NORTH

APPENDIX B

EXCERPTS FROM WORK PLAN:
UXO OPERATIONS AND SITE CONTROL MEASURES

EXCERPT 1 OF 3
ELEVEN PAGES

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 and 101 campsites. A total of approximately 113.9 acres will be cleared. HFA will begin operations on the south end of Red Creek trail just inside the Wilderness Area according to 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 in sequence beginning with Site 1. If the need arises to change priorities, the SUXOS 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. Additionally, all subsurface anomalies will be investigated to a depth of **four feet** beneath all inventoried camping areas. Deeper excavations will be undertaken only with the approval of the CEHNC on site Safety Specialist.

4.1.3 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 discovered, will be detonated in place or within the site where they were found, (IAW Instructions for Protection of the Cheat Mountain Salamander (CMS)).

4.1.4 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 onsite 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 general 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 gridding 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 feet search lanes, oriented to follow the trail's course. The lower left corner stake will be conspicuously painted and marked with that grid's identification number. Grids in danger areas which permit north to south orientation and larger grids, will have grids so established.

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 western boundary in an easterly direction. The Z coordinate will be recorded at the depth that the contact was found.

4.2.1.4 If a UXO is located and later detonated in place, the UXOS will show 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 to schedule clearance operations in a way that will reduce "backtracking" to an absolute minimum.

4.2.1.6 To simplify the efficient scheduling of work efforts, a weekly planning meeting will be conducted with Forest Service representatives attending.

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.

4.2.1.8 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, 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.

4.2.2.2 The Dolly Sods Wilderness will not be closed during UXO/OE operations. Trails and/or portions of trails will be posted and blocked as appropriate, during clearance operations to limit public access. A Maximum Creditable Event (MCE) will be based upon an 4.2" mortar which is 944 feet. If an item larger than a 4.2" mortar is discovered, the MCE will be adjusted accordingly. Signs and barricades will be placed at trail heads, and trails will be closed during OE removal.

4.2.2.3 Areas.

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

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

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

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

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

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

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

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

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

4.2.2.4 General Site Operations

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

4.2.2.4.2 Grids will be established before specific site 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. For trails, a 40 ft X 200 ft grid will be used. The 200 feet leg of the grid will be laid out along the axis of the trail with the centerline such that 20 feet of the base leg lie on each side of the trail centerline. The grids will be identified by the trail name and consecutively numbered starting with the first grid starting at the mouth of the trail entering into the wilderness area. The grid stake anchoring the left corner of the base leg will be designated the base stake.

4.2.2.4.3 No trees, brush or any other type of vegetation will be cut or *trimmed* within the Dolly

Sods Wilderness Area except as approved by Forest Service personnel.

4.2.2.4.4 No spray paint of any kind will be allowed within the Dolly Sods Wilderness Area.

4.2.2.4.5 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 that clearly indicate the area to be cleared. 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 or 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 undocumented, archaeological, and cultural sites will be plotted.

4.3.2.4 No trees, brush, or other vegetation will be cut or *trimmed* within the Dolly Sods Wilderness Area except as approved by Forest Service personnel. This is a strict rule laid down by the US Forest Service.

4.3.2.5 All subsurface searches will be conducted according to 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 QC/Site Safety Officer of all ordnance, ammunition, explosive items, components, and scrap encountered in each grid. This

Location Form (grid sheet) shown in Appendix E.

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

4.3.4.2 All intrusive operations will be accomplished according to 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. To conserve explosives and setup time if the UXO is 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. Never 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. The on site Forest Service persons' assistance will be sought 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.** 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 do so through the site office, 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 stealthiest), and safety sunglasses. A sturdy pair of hiking boots is 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 to successfully complete the subsurface magnetometer survey of each grid. Non UXO scrap will not be removed from any areas/grids. Scrap means metallic debris that is not contaminated with explosives. The scrap could be made up of UXO related material as long as:

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

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

4.3.7.3 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.

4.3.7.4 A final inspection of the scrap will be made by the SUXOS and the QC officer. Afterwards, the SUXOS will sign a certificate stating : "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.

4.3.7.5 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

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 each day and staged at a predetermined location. 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 stored in approved magazines at Bell Knob Tower.

4.3.8.3 All demolition explosives and UXO will be inventoried and accounted for before 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 always, unless 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 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 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS

4.3.9.1 All explosives and demolition materials will be stored in two portable type magazines located on US Forest Service land in the vicinity of Bell Knob Tower. **Magazine requirements/standards will be in accordance with the RASP (Appendix J).** The SUXOS will be responsible for the safe handling of all explosives.

4.3.9.2 The US Forest Service gate on the access road will be locked **always.**

4.3.9.3 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 in place for inclusion in the final report.

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.

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 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 (mushroom starter) will be inspected daily to insure that it is operating properly. The mushroom starter is a simple mechanical device with only two moving parts, the striker and a spring. Checking the starter requires that it be inspected to insure it is clean and operating freely.

4.3.10.3.2.2 The NONEL starter is designed to use a Federal No. 209 Shot Shell primer or equivalent.

4.3.10.3.2.3 Feed the NONEL through the upper hole in the safety ring on the starter base from the outside.

4.3.10.3.2.4 Pull six to eight inches of slack through passing it over the rim of the safety ring and through the lower hole into the port in the barrel. Then pull the loop formed as tight as possible as shown in Fig 4-1.

4.3.10.3.2.5 When the shot is ready and the area is clear, remove the striker from the receiver, place a shot shell primer in the receiver, and gently replace the striker. The spring will hold the striker in the ready position.

4.3.10.3.2.6 To fire the shot, set the starter on the ground or other hard surface, and firmly strike the starter with your fist or foot.

4.3.10.3.2.7 The SUXOS is responsible for maintaining 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 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. Controlling the firing post 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 "loud fire in the hole" followed by a long blast on the air horn will precede the firing of the charge(s).

4.3.10.4 <u>Detonating UXO in Place</u>

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 according to 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 decided 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 possible, to provide emergency support for the demolition team.

4.3.10.4.7 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 demolition 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 bunkers and transported to the site.

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" is 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 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:

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 before 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 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.

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].

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 pr icted, and can occur at any point on the site. All UXO that is detonated in place will be documen d and the position indicated on the site map. All demolition shots will be tamped with earth t ninimize fragmentation and noise emissions as described in the work plan. The following fragme ition distances are in reference to each individual site where potential OE contamination can be foun. 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

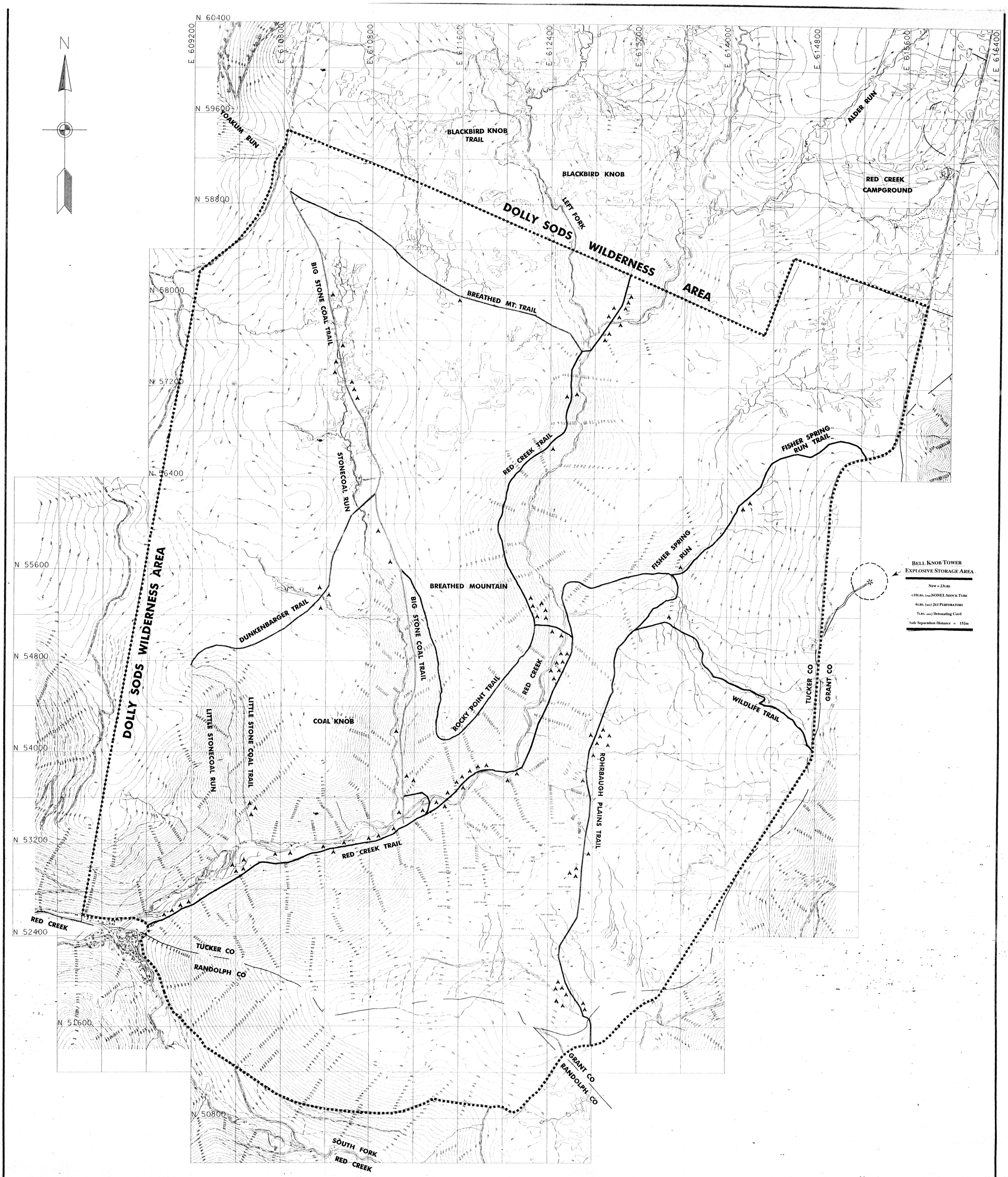
1.16 HAZARDOUS ASSESSMENT AND MITIGATION

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.



DOLLY SODS WILDERNESS AREA

1000 750 500 250 0 1000

SCALE IN METERS

LEGEND

DOLLY SODS WILDERNESS AREA BOUNDARY

IDENTIFIED CAMPSITES

TRAIL SEARCH AREAS

U.S. Army Corps of Engineers
Huntington District

EXCERPT 3 OF 3
THREE PAGES

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 14-1. 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 10-1 list the primary and secondary means of communication

COMMUNICATION PRIORITIES
TABLE 10-1

LOCATION	PRIMARY	SECONDARY
On-site	Radios or voice	Hand signals or air horn
On-site to Headquarters	Radios	Cellular Phone
Headquarters to Off-site	Cellular Phone	Cellular Phone

APPENDIX C

EXCERPTS FROM WORK PLAN:
OE HEALTH AND SAFETY PROCEDURES

CHAPTER 12
GENERAL SITE REQUIREMENTS

12.1 SAFETY TRAINING

12.1.1 The SUXOS, and SSO are responsible for setting up 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 Site Specific Safety and Health Plan.

12.1.2 All personnel will attend the initial site safety and indoctrination briefing before 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. A representative of the Davis Memorial Hospital has agreed to provide on-site emergency first aid and site specific hazards training to all site personnel. This training will be performed during the initial special briefings conducted when the site is opened.

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 at the Bell Knob Tower site. The HFA field office

headquarters will be housed in trailers.

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 summons 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 257-1212 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

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:	DACA87-94-D-0019
DELIVERY ORDER:	#020
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: _____

Prepared By: _____
Richard T. Thiel, Project Manager

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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
	Hepatitis B Vaccinations
	High Explosives
HAT	High Explosive Anti-Tank
	Human Factors Applications, Inc.
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In accordance with
IDLH	Immediately Dangerous to Life or Health
MSDSs	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.

9-12-96
Date

Health and Safety Manager
HFA, Inc.

9/12/96
Date

Corporate CIH Director

9/19/96
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, 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 35-40 miles east of Elkins, West Virginia. The work areas are divided into 9 sub areas located in the Dolly Sods Wilderness Area. They total approximately 113.9 acres and are designated as:

1.1.2.1.1 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.

1.1.2.1.2 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.

1.1.2.1.3 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.

1.1.2.1.4 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.

1.1.2.1.5 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.

1.1.2.1.6 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.

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

1.1.2.1.8 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.

1.1.2.1.9 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.

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

1.1.4 POLICY STATEMENT

1.1.4.1 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.

1.1.4.2 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.

1.1.4.3 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.

1.1.4.4 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.

1.2 REFERENCES

1.2.1 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 Chapter 15) 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 sampling 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 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. 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.

2.4.1.1 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.

2.4.1.2 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.

2.4.1.3 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.

2.4.1.4 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.

2.4.1.5 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.

2.4.1.6 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.

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

2.4.1.8 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.

2.4.1.9 Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.1O acres campsites; 5.5 acres trails.

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 immediately evacuate the area in an upwind direction. The UXO Supervisor will notify the SUXOS and CEHNC Safety Representative, who will in turn request for EOD/TEU support personnel. Other UXO teams will be notified, whether or not to remain where they are, or evacuate. This assessment will be made by the SSO.

2.5.3 SURVEYING AND MAPPING BOUNDARIES AND GRIDS/SITE PREPARATION

2.5.3.1 The area boundaries were previously established and mapped, HFA will establish grids, and

search lanes on the site. These activities will be completed at each work area prior to conducting UXO removal operations

2.5.3.2 Physical Hazards

2.5.3.2.1 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, since hidden debris can result in puncture wounds or lacerations. Biological hazards such as poisonous plants, insects, and animals may also be a concern to project personnel. Heat stress will not be a concern during this initial phase of the project; but it will be a concern during the follow on work in the spring and summer. Section 2.8.2 includes a thorough discussion on the signs and symptoms of heat stress.

2.5.3.2.2 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 Chemical Hazards

2.5.3.3.1 The potential for exposure to chemical hazards during this phase is not anticipated.

2.5.3.4 Biological Hazards

2.5.3.4.1 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.

2.5.4 ORDNANCE AND EXPLOSIVES REMOVAL ACTION

2.5.4.1 HFA will perform a surface and sub-surface clearance of ordnance and explosives; mapping; and disposing of all UXO. This removal action will include the removal and disposal of all ordnance, ammunition, and explosive and target-related scrap. This will be accomplished using magnetometers and hand excavation.

2.5.4.2 Physical Hazards

2.5.4.2.1 The physical hazards involved in this task are related to the removal and excavation of suspected UXO. UXO pose a significant threat to people if they are not carefully controlled. There exists a chance for a UXO to detonate if it is not excavated properly or safely handled. Employees must pay careful attention to what they are doing or risk serious injury. UXOs will not be handled, moved, or disturbed unless first positively identified, all initial movements will be done remotely. Exposure of UXO will be done by careful hand shovelling to remove soil, maintaining positive control at all times. UXO will generally be detonated in place.

2.5.4.2.2 All excavations will be completed by hand and will pose no confined space hazards.

2.5.4.2.3 Noise will not present a hazard at this site.

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 Section 2.6. If any unusual conditions arise pertaining to the release of liquid, vapors, and/or gases, work will immediately cease and personnel will be evacuated.

2.5.5 TURN-IN OF RECOVERED ORDNANCE AND EXPLOSIVES RELATED SCRAP

2.5.5.1 HFA will collect ordnance and explosive related scrap from the grids. This scrap will be turned-in to the nearest DRMO. However, if the DRMO refuses to accept the scrap, arrangements will be made with a local scrap contractor to pick up the material 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. Because of the poor footing and long distances that scrap must be hand carried UXO personnel must pay particular attention to what they are doing, and where they are walking, or risk injury. Handling procedures for preventing injuries will include wearing leather gloves, lifting with the legs, using two individuals when lifting scrap >50 pounds, 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 are no chemical hazards, other than exposure to explosive and explosive residue, involved with this project. Therefore chemical exposure is considered minimal. Care will be taken to avoid being cut while handling scrap items, to prevent 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 action will include observing/inspecting field operations and verifying that all ordnance, ammunition, and explosive-related scrap has been removed from the grids. This will be accomplished using magnetometers and hand excavation as necessary.

2.5.6.2 Physical Hazards

2.5.6.2.1 The physical hazards involved in this task are related to the removal and excavation of suspected UXO. UXO pose a significant threat to personnel if not carefully controlled. There exists a chance for a UXO to detonate if it is not excavated properly or safely handled. Employees must pay careful attention to what they are doing or risk serious injury. UXOs will not be handled, moved, or disturbed unless first positively identified, all initial movements will be done remotely. Exposure of UXO will be done by careful hand shovelling to remove soil, maintaining positive control at all

times. Excavations completed by hand will pose no confined space hazards.

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 Section 2.6. Should any release of liquid, vapors, or gases occur, work will immediately cease and personnel will be evacuated.

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 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. 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 Tables 2-1 and 2-2 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 2-1 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.

POTENTIAL CONTAMINANTS
TABLE 2-1

CONTAMINANT	EXPOSURE[1] LIMIT (PEL or TLV)	IONIZATION POTENTIAL (eV)	IDLH[1]
EXPLOSIVES			
Cyclomethylene trinitramine (RDX)	1.5 mg/m³ (TLV-skin)[2]	N/A	N/A
1, 3-Dinitrobenzene	1 mg/m³ (PEL-skin)[2] 0.15 (TLV-skin)[2]	10.43	200 mg/m³
1, 3, 5 - Trinitrobenzene	N/A	N/A	N/A
N-methyl-N,2,4,6,-tetranitroaniline(Tetryl)	1.5 mg/m³ (skin)[2]	N/A	N/A
Pentaerythritol tetranitrate (PETN)	N/A	N/A	N/A
Composition B	N/A	N/A	N/A
Trinitroluene (TNT)	0.5 mg/m³ (TLV-skin)[2] 1.5 mg/m³ (PEL-Skin)[2]	10.59	N/A
SCREENING SMOKE			
White Phosphorous (WP)	0.1 mg/m³	N/A	N/A

1 *Exposure limits expressed in mg/m³ except where noted;*
2 *Indicated that exposure limit was established to prevent dermal absorption*
N/A *Not Assigned, Not Available, or Not Applicable*

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 2-2 summarizes the symptoms and effects of exposure for each substance identified as a potential contaminant.

SYMPTOMS OF POTENTIAL CONTAMINANTS
TABLE 2-2

CONTAMINANT	SYMPTOMS AND EFFECTS
EXPLOSIVES	
Cyclotrimethylene trinitramine (RDX)	Respiratory tract irritation, unconsciousness, convulsions, headache, dizziness, nausea, and vomiting. Possible irritation to eyes.
1,3-Dinitrobenzene	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.
1,3,5-Trinitrobenzene	May cause cyanosis, nausea, headache, dizziness, dyspnea, confusion, hypertension, lethargy, convulsions, and coma.
Nmethyl-N,2,4,6,-tetranitroaniline (TETRYL)	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.
Pentaerythritol tetranitrate (PETN)	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.
Trinitrotoluene (TNT)	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.
SCREENING SMOKE	
White Phosphorous (WP)	If ingested, can cause nausea, vomiting, severe abdominal pain and liver damage. Inhalation overexposure can produce irritation, severe burns, anemia, loss of appetite, gastrointestinal complaints, chronic cough, paleness, and slack jaw.

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 2-3 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.

THRESHOLD LIMIT VALUES FOR NOISE
TABLE 2-3

Duration per Day Hours	Sound Level dBA*
16	82
8	85
4	88
2	91
1	94
1/2	97
1/4	100
1/8	103

* *Sound levels in decibels are measured on a sound level meter and set to use the A weighted network with slow meter response.*

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 <u>The Effects of Heat</u>

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 reacclimated.

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

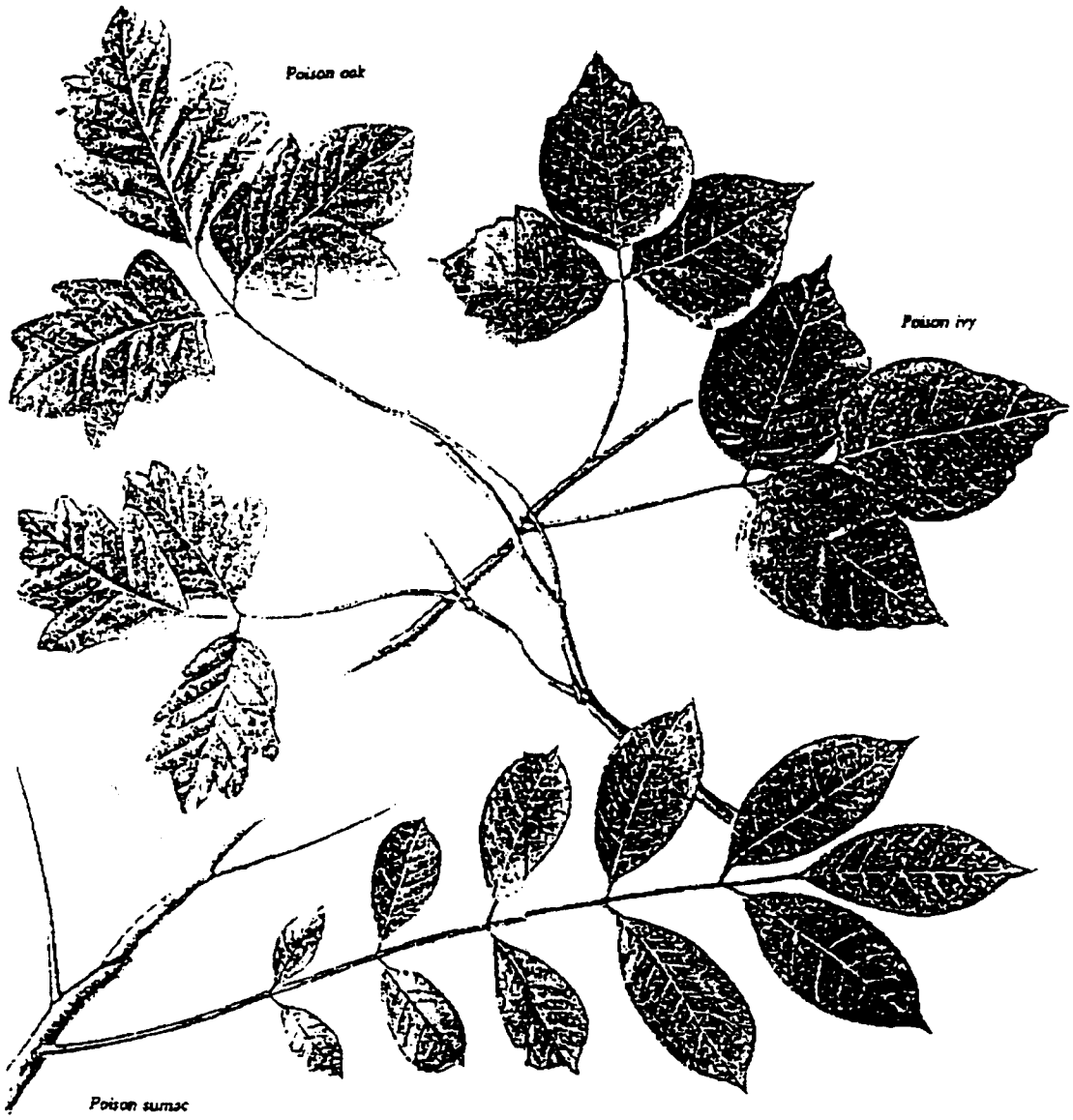
2.11.1.1 Poisonous Plant Avoidance Procedures

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) 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.

POISONOUS PLANTS
FIGURE 2 - 1



Three urushiol members of the sumac family, Anacardiaceae.

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. Save the tick in a jar labeled with a date, body location of the bite, and place it where it may have been acquired.

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 <u>Spiders</u>

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 reactio from snakebites are aggravated by acute fear and anxiety. The severity of local and general react from poisonous snakebites depends upon the amount of venom injected and the speed of absorpti size of the victim, protection from clothing, speed at which anti-venom can be provided, and the cation 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 AN QUALITY CONTROL SPECIALIST

3.1.8.1 All UXO Specialists 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 4-1 lists the training dates for the 40 hours of HTRW, 8 hours annual refresher, 8 hours supervisor, and First Aid/CPR.

TRAINING DATES

TABLE 4-1

Name	40 Hour	8 Hour Refresher	8 Hour Supervisor	First Aid/CPR	Miscellaneous Training

Note: Refresher training required for personnel will be accomplished prior to commencement of field activities.

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 5-1.

REASONS TO UPGRADE OR DOWNGRADE LEVEL OF PPE
TABLE 5-1

UPGRADE	DOWNGRADE
• Request of individual performing task.	• New information indicating that situation is less hazardous than originally though.
• Change in work task that will increase contact or potential contact with hazardous materials.	• Change in site condition that decreases the hazard.
• Occurrence or likely occurrence of gas or vapor emission.	• Change in work task that will reduce contact with hazardous material.
• Known or suspected presence of dermal hazard.	
• Known or suspected presence of airborne radioactive material.	

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 5-2 summarizes the PPE for each level of protection identified for site activities.

PPE CONSIDERATIONS
TABLE 5-2

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 Ordnance and Explosive Related Scrap	D	
Quality Control	D	

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)
- SMA-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 6-1 shows the employees' participation in the medical surveillance program. It includes the employees' name, date of last examination, and name of reviewing occupational physician.

MEDICAL SURVEILLANCE PROGRAM
TABLE 6-1

NAME	DATE OF LAST EXAMINATION	REVIEWING OCCUPATIONAL PHYSICIAN

Note: Annual OSHA medical examination will be completed prior to commencement of the project.

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 2-2).

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, Dry 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 8-1 to determine 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 will be able to 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) and weight loss monitoring outlined in paragraphs 8.2 and 8.3.

PERMISSIBLE WBGT HEAT EXPOSURE THRESHOLD LIMIT VALUES[a]

TABLE 8-1

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 (25.5)
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). 1993 - 1994 Threshold Limit Values and Biological Exposure Indices. Cincinnati, OH.*

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 prior to 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 BODY WEIGHT LOSS

8.3.1 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:

8.3.1.1 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}).

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

8.3.1.3 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.

8.4 HEAT STRESS DOCUMENTATION

8.4.1 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.

8.5 COLD STRESS MONITORING

8.5.1 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 8-2 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.

8.5.2 WORK-WARMING REGIMEN

8.5.2.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) or 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. Table 8-3 lists Threshold Limit Values for working in the cold. 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 will 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 their 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 effect.

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

8.5.2.2.1 The worker will be under constant protective observation (buddy system or supervision).

8.5.2.2.2 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.

8.5.2.2.3 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 required protective clothing.

8.5.2.2.4 The weight and balkiness of clothing will be included in estimating the required work performance and weights to be lifted by the worker.

8.5.2.2.5 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.

8.5.2.2.6 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.

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

8.5.2.2.8 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.

8.5.3 Workplace monitoring is required as follows:

8.5.3.1 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.

8.5.3.2 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.

8.5.3.3 In indoor workplaces, the wind speed should be recorded at least every four hours whenever the rate of air movement exceeds two meters per second (5 mph).

8.5.3.4 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).

8.5.3.5 The equivalent chill temperature will be obtained from Table 8-3 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).

8.5.3.6 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.

8.5.3.7 Trauma sustained in freezing or subzero 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.

TABLE 8-2
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 8-3
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/m²*; all non-emergency work should have ceased at or before a wind chill of 2,250 W/m². 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.

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 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 14-1. 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 10-1 list the primary and secondary means of communication.

COMMUNICATION PRIORITIES
TABLE 10-1

LOCATION	PRIMARY	SECONDARY
On-site	Radios or voice	Hand signals or air horn
On-site to Headquarters	Radios	Cellular Phone
Headquarters to Off-site	Cellular Phone	Cellular Phone

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 HEAVY EQUIPMENT AND VEHICLES

12.2.1.1 Prior to removal from the site, thoroughly wash the equipment/vehicles with nonphosphate 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 13-1 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:

EMERGENCY EQUIPMENT REQUIREMENTS

TABLE 13-1

Emergency Equipment	Locations where Emergency Equipment is to be Stored	Operations where Emergency Equipment is Required
Standard industrial first aid kit	Each Team, SSO Vehicle, and CP	All Operations
burn kit/blanket	Cached on site, and CP	
fire extinguisher, rated at least 1A, 10BC	SSO Vehicle, and CP	
portable stretcher	Cached on site, SSO Vehicle	
15 minute eyewash	SSO Vehicle	
CPR mask shield	Cached on site, SSO Vehicle, and CP	
Airhorn	Each Team, SSO Vehicle, and CP	
Portable eyewash kit	Each Team, SSO Vehicle, and CP	

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. All hazardous waste spills will be in accordance with HFA's CEHNC approved Heavy Equipment SOP, Spill Response Procedures, (Section 5.0).

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 14-1 lists emergency contacts, and Figure 14-1 delineates basic emergency response procedures. Evacuation procedures will be discussed regularly with all personnel.

EMERGENCY CONTACTS
TABLE 14-1

ORGANIZATION	CONTACT NAME & PHONE NUMBER
ONSITE	
Police Department (State Police)	(304) 637-0200
Fire Department (Forest Service District Ranger)	(304) 257-4488
Medical Facility (Davis Memorial Hospital)	(304) 637-3337
Emergency Medical Services	(304) 257-1212
Forest Service Representative	On Site
HFA, Inc.	
Senior Project Manager (Richard Thiel)	301-705-5044
Health and Safety Manager (Michael L. Winningham)	301-705-5044
EOD TEU	
48th Ord Det (Fort Jackson, SC)	(803) 751-5126
TEU (APG Edgewood Area)	410-671-2773
USACE	
Project Manager (Mr. Bill Sargent)	205-895-1562
CEHNC Safety Office	205-895-1587 1580
Other	
CHEMTRAC	800-424-9300
Explosives Division (Department of the Treasury)	202-927-7920

14.3 RESPONSIBILITIES

14.3.1 The Project Manager or SUXOS 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 (SSO, UXO Supervisors, etc.).

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.

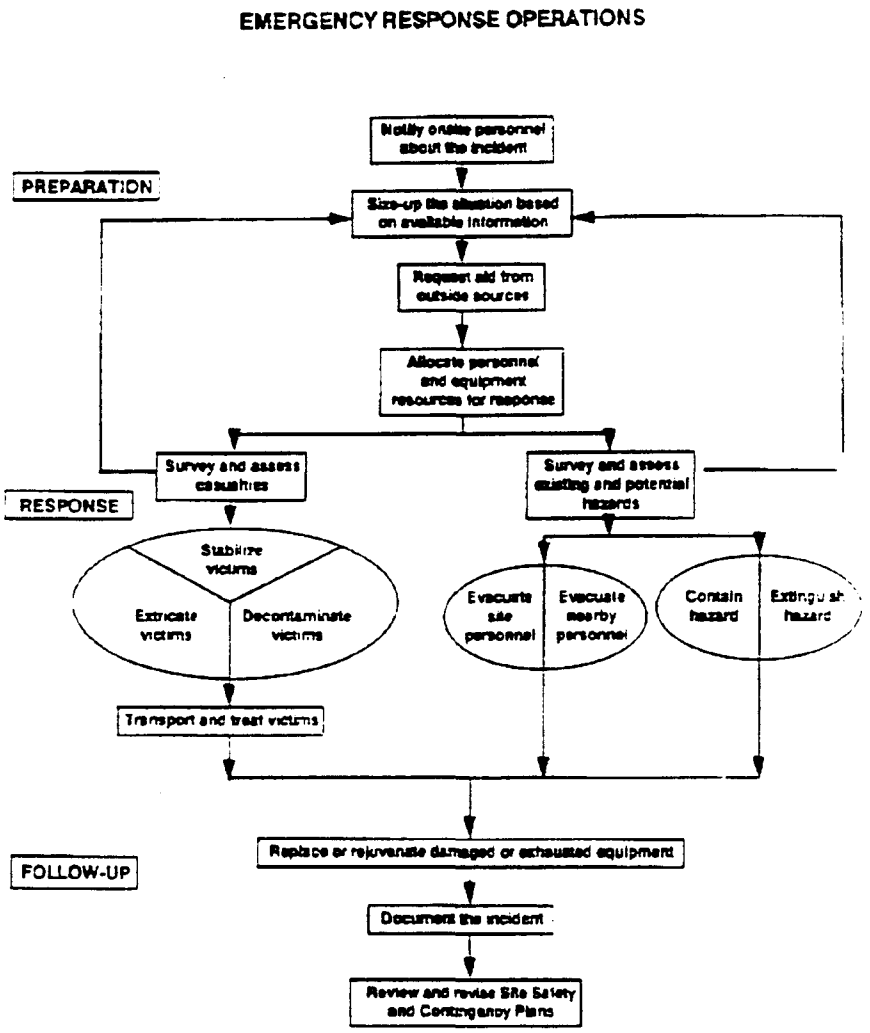
14.3.2.2 While assessing the emergency situation, notify appropriate emergency personnel and the CEHNC Safety Specialist.

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).

EMERGENCY RESPONSE OPERATIONS

FIGURE 14-1



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 megaphone;
- a siren; or
- a whistle.

14.16 SIGNALS

14.16.1 Emergency communication signals will be clear to all personnel. Table 14-2 lists signals for different communication devices and situations.

COMMUNICATION SIGNALS

TABLE 14-2

DEVICE	SIGNAL
Radio	Established Code Words
Air Horn 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
	Hands waving 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.

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.

APPENDIX D

ACTION MEMORANDUM

ACTION MEMORANDUM
DOLLY SODS WILDERNESS
FORMER WEST VIRGINIA MANEUVER AREA
NEAR DAVIS, WEST VIRGINIA

I. PURPOSE: The purpose of this paper is to document the proposed ordnance and explosives (OE) removal action for the Dolly Sods Wilderness in central West Virginia.

II. SITE CONDITIONS AND BACKGROUND: This is a non-time-critical removal action to minimize a threat to the public due to the presence of OE.

A. Site Description

1. Removal Site Evaluation: During World War II this site was a part of the 2,181,000-acre West Virginia Maneuver Area. Due to the need for immediate training during World War II, the Secretary of War leased the area on 6 August 1943 from private companies and used it for less than two years for maneuvers and as an artillery and mortars target area for the Thirteenth Army Corps of the Third Army. Apparently it was also used for a few months by the Office of Scientific Research and Development to test fire rockets and projectiles. The site is now operated by the U.S. Forest Service as the Dolly Sods Wilderness and is open to the public at all times. It is frequently used for hiking, camping, picnics, and hunting. The Forest Service has documented 20.8 miles of frequently used trails and 101 commonly used camping areas in the Wilderness. Although areas were searched and cleared after World War II by military Explosive Ordnance Disposal (EOD) teams, at least three 81-mm mortar shells have been found in recent years by the public in Dolly Sods and at least 4 in adjacent areas. It has been reported that 105-mm shells have also been found in the vicinity. The U.S. Army Corps of Engineers conducted a Feasibility Study in 1991 and concluded that a hazard to the public exists. During the Feasibility Study remains of 4.2", 57-mm, 60-mm, and 81-mm high explosives and smoke rounds were found.

2. Physical Location: Dolly Sods Wilderness is a 10,215-acre site within the Monongahela National Forest in Grant, Tucker, and Randolph Counties of West Virginia. It is bordered by private property to the west (Cabin Mountain) and Forest Service owned land to the north (Blackbird Knob), east (Bell Knob), and south (Flat Rock Plains).

3. **Site Characteristics:** Dolly Sods is an undeveloped area of high elevation with wind-swept plains on the Allegheny Plateau. The terrain is rocky and rugged and the plant and animal life is comparable to that of northern Canada. Notable features include Red Creek and its tributaries, Breathed Mountain and other knobs, and the "sods" or bogs in the level parts of the wilderness. Animal life is diverse with the only known endangered species being the Cheat Mountain Salamander and, possibly, the Northern Virginia Flying Squirrel. There are also areas of archaeological significance and sensitive plant life.

4. **Threat to the Environment:** Portions of Dolly Sods were known target areas for 81-mm mortars and 105 and 155-mm artillery as well as for field maneuvers. Due to the expedited nature of the training, exact records were not kept or have been lost or destroyed. Live ordnance is still being found and removed from the area by the public, creating a hazardous situation.

5. **NPL Status:** The site is neither listed nor proposed to be listed on the National Priority List (NPL). Since there are no known toxic contaminats at the site, it will not receive a Hazard Ranking System rating, be evaluated by the Agency for Toxic Substances and Disease Registry, or be referred to the site assessment program.

6. **Maps:** Maps indicating the firing locations, targets, and locations of discovered ordnance at Dolly Sods are attached.

B. Other Actions to Date

1. Previous Actions

a. Shortly after operations ended at the Maneuver Area, the artillery range was searched and discovered ordnance destroyed. After hikers continued to find isolated ordnance, military EOD teams again searched the area and destroyed ordnance. However the extent of these efforts is not known and ordnance continues to be discovered by the public and reported to the Forest Service or local sheriffs. The Forest Service reports that three 81-mm mortar shells have been recorded at the site and others from adjacent areas. There are also unofficial reports of ordnance found and removed by hikers and hunters.

b. As part of the Defense Environmental Restoration Program, formerly used defense sites were investigated nationwide

by the Corps of Engineers. As a result of this investigation, the Corps conducted the 1991 Feasibility Study. The study included searching a sampling of areas considered to most likely have been used as targets or contain overshots or undershots. A total of 281 of the 10,215 acres were searched with magnetometers. Thirteen pieces of ordnance were found from 6 to 24 inches beneath the surface. One piece of ordnance was found within several feet of a site used as a campfire pit. It was concluded that further remediation of the Wilderness is needed to reduce the risk to the public. It was also concluded that further study was needed of endangered species habitats and means to protect them and of steps to preserve the archaeological value of the area.

c. To accomplish this the "Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment" was prepared in 1995. Means to protect endangered species, their habitat, and archaeologically significant areas were established during the Environmental Assessment (EA) process. A Finding of No Significant Impact was signed by the Commander of the Corps' Huntington District and the Supervisor of the Monangahela National Forest in September of 1995.

2. **Current Actions:** There are no known actions by the EPA, other regulators, or private entities at this site.

C. State and Local Authorities' Role

1. **State and Local Actions to Date:** Ordnance found onsite is reported to the Forest Service who arranges to have it destroyed in place by an EOD team from Ft. Belvoir, VA. Ordnance removed from the area is often turned over to the local sheriffs who have it destroyed.

2. **Potential for Continued State/Local Response:** Support from the Forest Service, local sheriff departments, and Fort Belvoir should continue.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare: The actual amount of ordnance is undetermined but the risk is illustrated by the discovery of ordnance within several feet of a site used as a

campfire pit. If the fire had been located over the buried ordnance, there is the likelihood that the ordnance would have detonated, potentially harming several persons. There is also the potential for tent pegs to be driven into buried ordnance or children to find and pick up pieces of ordnance. A high concentration of ordnance is thought to exist within the Red Creek Valley (where campers are commonly found) of the Wilderness. It is projected that between 45,000 and 76,000 visitors visit the Wilderness annually.

B. Threats to the Environment: Accidental detonation of ordnance has little impact on the environment unless fires are started, as occurred due to artillery fire when the Maneuver Area was active. Due to its harsh environment the Wilderness Area is extremely slow in recovering from any detrimental activities. (In the early 1900's, fires destroyed the humus layer, leaving the current, relatively infertile rocky terrain.)

IV. ENDANGERMENT DETERMINATION: The risk of accidental detonation of any remaining ordnance, if not addressed, represents a substantial endangerment to public welfare and the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions: Three alternatives were evaluated - (1) No Action, (2) clear hiking trails and 20 feet on each side to a depth of one foot, and (3) clear camping areas to a depth of four feet and trails as in alternative 2. For each alternative, the remaining risk to the public was evaluated using methodology specifically developed for the Corps of Engineers to assess sites containing UXO. Risk is evaluated based on the potential for an individual to come within the immediate proximity of UXO and the potential consequences. A comparison of the alternatives is provided on the following table assuming continued high use of the area by the public. (Exposure is defined as a member of the public being present in immediate proximity to UXO.)

Alt.	Area Remediated (acres)	Projected Exposures	Risk Reduction	Costs
1	None	1258/year	None	None
2	103.7	659/year	47.6%	$1.23M

3	105.2	517/year	58.9%	$1.29M

1. **Proposed Action Description:** In alternatives 2 and 3 trails will be searched their entire length and 20 feet to each side by UXO specialists using handheld ordnance detection devices such as metal detectors. If metal is indicated the area will be excavated by hand to a depth of one foot. In alternative 3 cleared areas used for camping will also be searched and excavated to a 4-foot depth where metal is indicated. Small undergrowth, grasses, and fallen trees will be cleared only if necessary to search an area and only if the area is accessible to hikers, campers, or hunters. Earth will be excavated only if metal objects are detected. Discovered UXO will be destroyed in place by detonation. Before any onsite work commences, trained personnel will work closely with the U.S. Forest Service, U.S. Fish and Wildlife Service, and the State of West Virginia Department of Natural Resources to define potential archaeologically significant areas, sensitive plants, and animal habitats that must be protected and to establish steps to avoid or minimize impacts. Prior to any excavation or detonation the impacted area will be investigated and endangered or threatened plants and animals removed and archaeologically significant items removed or protected. Disturbed areas will be covered with leaves and other materials found in the area to minimize exposure to the elements.

2. **Contribution to Remedial Performance:** As noted in the previous tables, remediation alternatives 2 and 3 will reduce the risk of exposures by a projected 47.6% and 58.9% respectively. Lessons learned from other sites indicate that searching and clearing areas outside of the established trails and campgrounds will be unfeasible due to the large area, terrain, and costs.

3. **Description of Alternative Technologies:** In this project there are no practical alternatives to manually searching the areas and detonation in place. It is not safe to move UXO.

4. **EE/CA:** A Feasibility Study, a separate Risk Assessment, and an Environmental Assessment were performed to complete the Engineering Evaluation Cost Analysis (EE/CA) process. The described alternatives were evaluated in the Risk Assessment dated February 1995 and the Environmental Assessment.

5. **Applicable or Relevant and Appropriate Requirements (ARARs):** Federal ARARs determined to apply to this site are the

Defense Environmental Restoration Program (DERP) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Remediation shall be in accordance with the Occupational Safety and Health Administration (OSHA) Standards, the National Contingency Plan, and the Department of Defense Explosive Safety regulations.

B. Estimated Costs: See preceding table.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN: Popularity of the Wilderness Area is steadily increasing. Consequently the potential for accidental detonation of ordnance and subsequent injury to or death of members of the public will increase as use of the area increases.

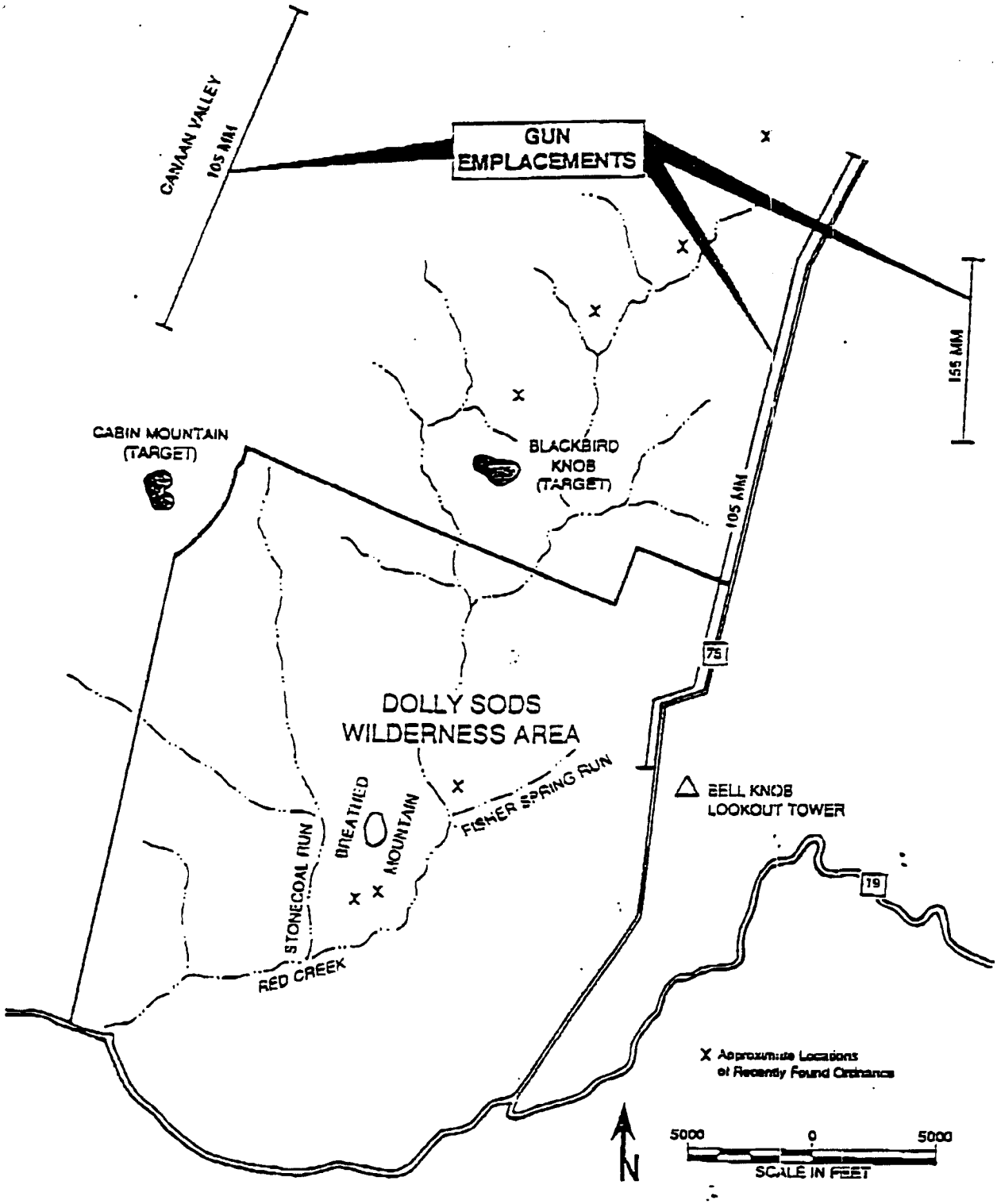
VII. Outstanding Policy Issues: Before any onsite work commences, trained personnel will work closely with the U.S. Forest Service and the Department of Natural Resources to define archaeologically significant areas, sensitive plants, and animal habitats that must be protected and to establish steps to avoid or minimize impacts. These steps and procedures will be explained in a workplan.

VIII. Enforcement: Since no nonfederal entities are known to have contributed to the contamination, no enforcement strategy is needed.

IX. Recommendation: Alternative 3, clearing 20.8 miles of recorded trails and 20 feet on each side of the trails to a depth of one foot and the 101 recorded camp sites to a depth of 4 feet, is recommended. Alternative 3 is preferred over alternative 2 because with less than a 5% increase in cost, another 24% reduction in the projected risk is achieved. The No Action alternative is not recommended because of the increasing risk to the public.

ALEXANDER R. JANSEN
Colonel, Corps of Engineers
Commander

5/8/96
(Date)



Firing locations and general target areas at Dolly Sods.