

00U6 WORK PLAN ADDENDUM

TO

**HFA ORDNANCE REMOVAL ACTION
FORMER CAMP CROFT WORK PLAN**

CONTRACT No. DACA87-94-D-0019

DELIVERY ORDER No. 0012

10 MAY 96

PREPARED FOR

**US Army Engineering and
Support Center, Huntsville**

PREPARED BY

ZAPATAENGINEERING

TRUST • INTEGRITY • QUALITY

CONTRACT No. DACA87-00-D-0034

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1.0 INTRODUCTION

ZAPATAENGINEERING, P.A. is conducting an ordnance removal action in Ordnance Operable Unit 6 (OOU6) under contract number DACA87-00-D-0034 (Task Order 0001, Modification 1), from the US Army Engineering and Support Center, Huntsville (USAESCH), Alabama. The purpose of the Task Order is to perform a subsurface ordnance removal operation in the areas identified in the Scope of Work (SOW) (Appendix 11.2, herein) at the Former Camp Croft, Spartanburg, South Carolina.

1.0.1 This workplan is an addendum to the approved Former Camp Croft Workplan by Human Factors Applications, Inc. (HFA), dated 10 May 1996. All elements of the approved workplan continue to apply except as modified herein. The work required under this Scope of Work (SOW) falls under the Department of Defense Environmental Restoration Program – Formerly Used Defense Sites (DERP-FUDS). The work will be performed in a manner consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104 and the National Contingency Plan (NCP) Sections 300.120(c) and 300.400(e).

1.1 General Information

Ordnance Operable Unit 6 (OOU6) has previously been cleared of ordnance with the exception of nine contiguous grids. Each grid is 100 ft by 200 ft and contains considerable metal fragments within eight to twelve inches of the ground surface.

1.1.1 The USAESCH, through an agreement with the US Air Force Research Laboratory (USAFRL), Tyndall Air Force Base (AFB), Florida, proposes to use a remotely controlled bulldozer (D-8) and a remotely controlled excavator at this site to remove the uppermost eight to twelve inches of soil. USAFRL employees will operate both pieces of equipment from a control vehicle parked outside the exclusion zone. During the non-bulldozing and non-sifting workdays, HFA will conduct “mag and flag” ordnance removal operations within the areas where metallic clutter has been reduced by the remote-controlled excavation.

1.2 Site Location

The Former Camp Croft is located approximately five miles southeast of Spartanburg, South Carolina. OOU6 is located east of Croft State Park on privately owned property adjacent to and south of US Highway 176 Bypass, south of the intersection with State Highway 295.

1.3 Site History

In 1984, the US Army Corps of Engineers (USACE) conducted a site survey of the Former Camp Croft. This site survey concluded that the “potential for unexploded and dangerous bombs, shells, rockets mines and charges either upon or below the surface” could be found at the Former Camp Croft. In 1991, the USACE, Charleston District, conducted a Preliminary Assessment Study of this site. This study determined that the site was eligible for further investigation under the DERP-FUDS program.

1.3.1 In 1994 and 1995, HFA performed a Time Critical Removal Action (TCRA) in OOU6 at the Former Camp Croft. The TCRA was planned for a 30-acre area owned by Dr. Brownlee

Lowry but was completed over an area of approximately 15 acres. The areas cleared included access roads adjacent to and southwest of the nine-grid area. Ordnance items including one live 105mm with M48 fuse, two 60mm HE with fuses and one 155mm burster tube were recovered.

1.3.2 In 1995 and 1996, Environmental Science and Engineering, Inc. (ESE) performed an Engineering Evaluation/Cost Analysis (EE/CA) at the Former Camp Croft. The EE/CA addressed nine areas within the Former Camp Croft where OE items were either previously confirmed or suspected. One of the nine areas, referred to as Grid 87, is a 28-acre rectangular parcel encompassing the nine-grid area of investigation for this project. Grid 87 was geophysically investigated with magnetometers and intrusively investigated by hand. UXO findings included four 60mm and seven 81mm projectiles, nine 105mm smoke canisters, mortar parts and numerous OE fragments.

1.3.3 In 1996 and 1997, Parsons Engineering Science, Inc., through an OE Engineering Design, evaluated OOU6 to determine the nature and extent of OE contamination and determined the most appropriate response action to reduce the public safety risk posed by OE at the site. In the area designated as Grid 87, Parsons recommended a surface clearance of OE with subsurface clearance to a depth of four feet.

1.3.4 In 1997 and 1998, HFA conducted an ordnance removal action in the area designated as Grid 87, within OOU6. Upon completion of the removal action, nine smaller contiguous grids within Grid 87 failed the USAESCH's quality assurance inspections. During the removal action, it was discovered the nine grids are highly contaminated with OE scrap and fragments and were presumed to be within an impact area.

1.3.5 In 1999, UXB International, Inc. (UXB) was tasked to conduct an ordnance removal action in the nine contiguous grids located in OOU6. UXB evaluated a previous contractor's geophysical data and conducted further geophysical investigations using a Schonstedt magnetometer and a technique known as "mag and flag" to locate anomalies for investigation. Geophysical data verified the presence of substantially large amounts of metallic clutter and debris within the top one foot of topsoil. Upon further review of the metallicly cluttered nature of the nine grids and the investigation procedures employed by UXB, the USAESCH stopped the removal action.

1.3.6 Based on site conditions, the removal operation described in this addendum will be conducted in two phases. The first phase involves the removal of the top eight to twelve inches of soil using remotely operated heavy equipment. The second phase involves the employment of the "mag and flag" technique using an EM-61 hand-held (HH) unit. The EM-61 HH is an electromagnetic sensor currently used in many subsurface ordnance investigations.

1.4 Topography

The local topography of the nine contiguous grids in OOU6 varies from very slightly sloped in the eastern direction on the western side of the area to steeply sloped in the eastern direction on the eastern side of the area. The equipment staging area located east of, adjacent to and outside of the nine contiguous grids was chosen because of its relatively level surface. The steep slope

on the eastern side of the nine-grid area may pose difficulty in the maneuverability of the remotely operated equipment. However, it is not anticipated to impact site operations.

1.5 Climate

The National Weather Service Greenville-Spartanburg, SC station maintains general climatic conditions and information for the area encompassing this site. The unabbreviated version of the following general climatic description can be found at <http://www.nws.noaa.gov/er/gsp/climate/gspgen.txt>.

1.5.1 The elevation of the project area, ranging from 800 to 1,100 feet, is conducive to cool nights, especially during the summer months. Winters are quite pleasant, with the temperature remaining below freezing throughout the daylight hours only a few times during a normal year. There are usually two freezing rainstorms each winter and two or three small snowstorms. Rainfall in this area is usually abundant and spread quite evenly through the months. Droughts have been experienced, but are usually of short duration.

1.5.2 The mountain ridges, which are oriented northeast to southwest, appear to have an influence on the direction of the wind. The prevailing directions are northeast and southwest, divided almost evenly, with fall and winter seasons favoring northeast and spring and summer seasons favoring southwest. Destructive winds occur occasionally, but tornadoes are infrequent in this vicinity.

1.5.3 In the southern two-thirds of Greenville and Spartanburg Counties, including the cities of the same names, the average occurrence of the last temperature of 32 degrees in spring is late March and the average occurrence of the first in fall is early November, giving an average growing season of 225 days.

2.0 TECHNICAL MANAGEMENT PLAN

2.1 General

This Technical Management Plan details the approach, methods and operational procedures that will be used for OE and technical operations during the ordnance removal action to be conducted in the nine-grid area in OOU6.

2.1.1 Pertinent Guidance, Regulations and Policy

In addition to the Scope of Work, the workplan generally conforms with and reflects the following applicable laws, regulations and appropriate guidance publications, at a minimum;

1. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
2. National Contingency Plan (NCP)
3. National Institute of Occupational Safety and Health (NIOSH) and Edgewood Research, Development and Engineering Center ERDEC guidelines
4. South Carolina Department of Health and Environment Control (SC DHEC), United States Environmental Protection Agency (US EPA), USAESCH, USACE, Department of the Army (DA) and Department of Defense (DOD) (pertaining to personnel, equipment and procedures)
5. US Army Regulations

2.1.2 Chemical Warfare Materiel (CWM)

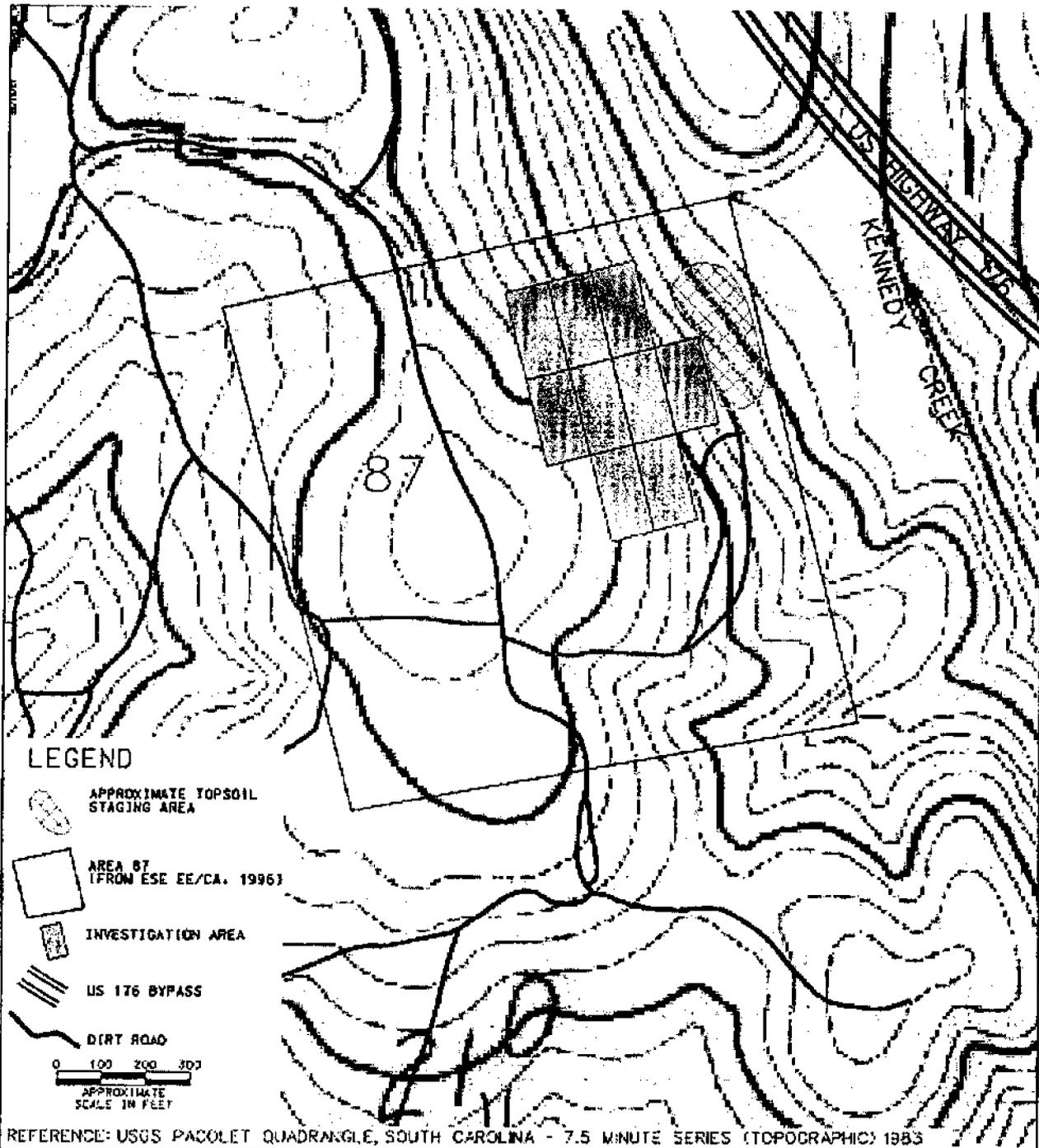
Chemical Warfare Materiel (CWM) is not anticipated on this site. In the event CWM is discovered during field operations, all work will immediately stop, field personnel will withdraw immediately upwind from the area and the USAESCH representative will be notified. Site personnel will stand by for instructions from the USAESCH safety and contracting officers.

2.1.3 Technical Project Scope

Ordnance Operable Unit 6 (OOU6) is approximately 28 acres and has previously been cleared of ordnance with the exception of 4.50 acres composed of nine contiguous grids. Each grid is 100 ft by 200 ft and contains considerable metal fragments within eight to twelve inches of the ground surface. The nine grids are located in the eastern part of OOU6. Refer to Figure 2-1 for grid locations.

2.1.3.1 The USAESCH, through an agreement with the US Air Force Research Laboratory (USAFRL), Tyndall Air Force Base (AFB), Florida, will use a remotely controlled bulldozer (D-8) and a remotely controlled excavator at this site. Normal site operations will be four 10-hour days. Overtime work may be approved, as necessary, based on site conditions. USAFRL employees will operate both pieces of equipment from a control vehicle parked outside the exclusion zone. The bulldozer will skim the surface of the site, removing soil to a design depth of approximately eight to 12 inches.

Figure 2-1 Location Map



REFERENCE: USGS PACOLET QUADRANGLE, SOUTH CAROLINA - 7.5 MINUTE SERIES (TOPOGRAPHIC) 1983

ZAPATAENGINEERING TRUST • INTEGRITY • QUALITY <small>100 WILSON BLVD. FORT WALKER, SC 29505 TEL: 803/763-5500 FAX: 803/763-5502 WWW.ZAPATAENGINEERING.COM</small>	 US ARMY ENGINEERING & SUPPORT CENTER FORT WALKER, ALABAMA	FORMER CAMP CROFT-08016			
		LOCATION MAP			
CONTRACT #1 DACA87-00-D-0034	PROJECT #1 ZE016100	DATE: 3-12-2001	EPANN DT: BLN	SCALE: AS SHOWN	1 SHEET: 2-1

2.1.3.2 The spoil material will be stockpiled. Material will be removed from the spoil pile using the USAFRL's remotely operated excavator with a one-third cubic yard bucket. The material will be sifted using a USAFRL-furnished "Nordberg Screen-All CV-90 D" with a remotely operated shut-off switch. The sifter will be checked routinely using a remotely operated camera on the extension of the excavator and, if needed, stopped and inspected for OE items by a qualified UXO technician. Sifted soil will be considered free of OE and stockpiled outside the nine-grid boundary using the remotely operated excavator. This clean material will continue to be stockpiled until the nine-grid site has been manually cleared of subsurface ordnance. Erosion-control measures will be employed to control runoff from the stockpile. At the conclusion of the removal effort, the stockpiled clean soil will be transported back into the nine-grid area. The area will be backfilled and the slopes will be stabilized and seeded.

2.1.3.3 During the non-bulldozing and non-sifting workdays, HFA will conduct "mag and flag" ordnance removal operations within the areas where surface material and metallic clutter have been reduced. HFA will use the audible signal from the hand-held electromagnetic sensor (EM-61) to locate subsurface anomalies to a depth of four feet from original ground surface.

2.1.4 Expected Number of Excavation

Based on previous clearance activities conducted by HFA, ZAPATAENGINEERING estimates approximately 720 anomalies within the nine-grid area, of which 100 are estimated to be UXO items. HFA estimates a removal rate of 8 minutes per selected anomaly.

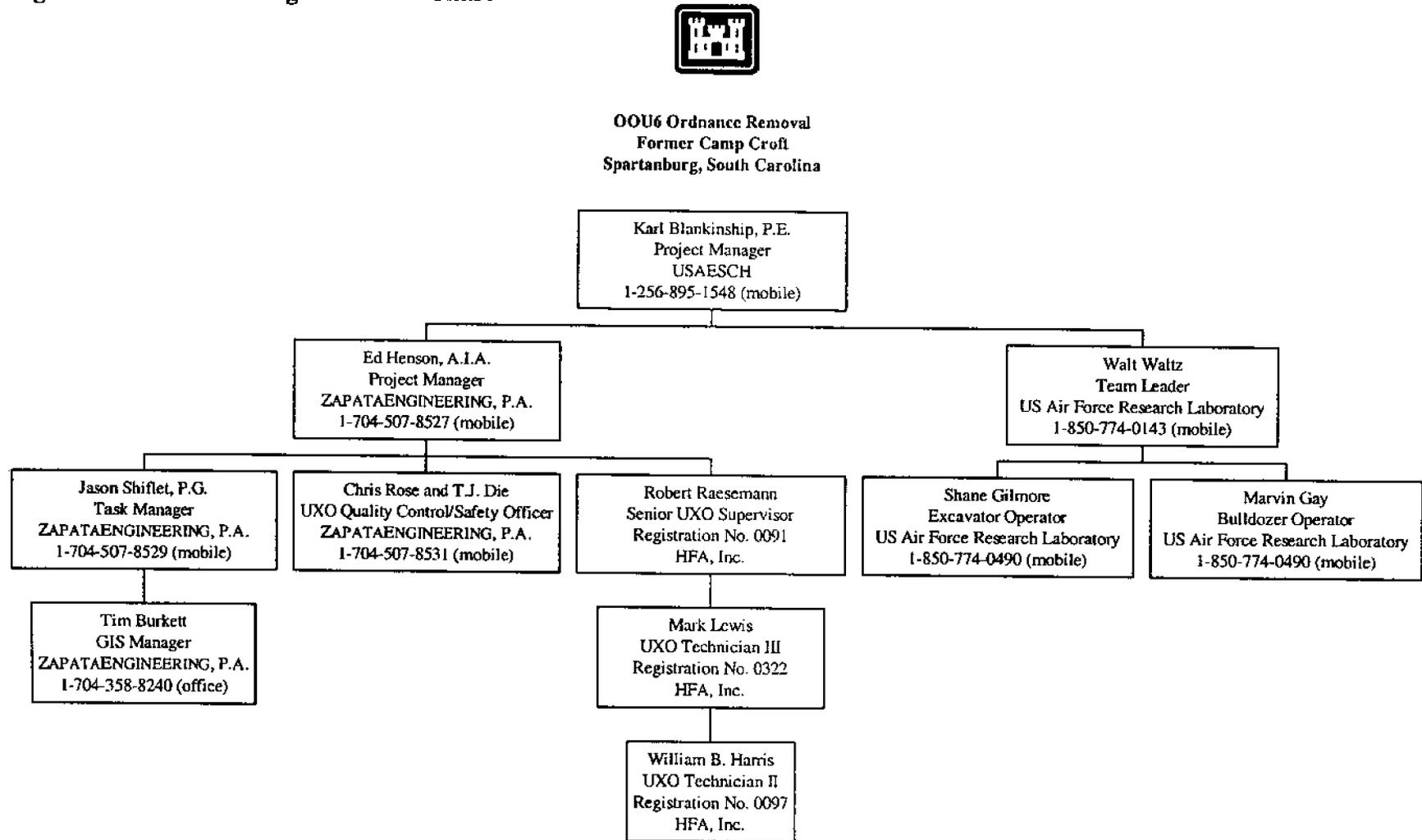
2.2 Organizational Chart

ZAPATAENGINEERING, as the prime contractor, will oversee all work activities. A ZAPATAENGINEERING UXO Safety Officer (UXO SO) will be on-site during all field operations. The UXO SO will also serve as the Quality Control Officer (UXO QC). The primary job of the UXO QC will be to evaluate HFA's ordnance removal operations and assure that ordnance removal objectives set forth in the scope of work are met. HFA will provide the Senior UXO Supervisor (SUXOS) and UXO Technicians (III and II) for field operations. Refer to Figure 2-2 for the organizational structure.

2.3 Mobilization Plans

ZAPATAENGINEERING will establish a site office at 800 Dairy Ridge Road. The 12 ft by 60 ft office trailer will consist of two offices separated by a central storage area. Power and telephone service will be established. Earthen magazines, located on-site adjacent to the office trailer, will provide additional secure equipment storage space. Explosive magazines will be established at the office trailer site at a minimum of 700 feet away from the office trailer and 800 feet from Dairy Ridge Road. The office-trailer site is gated and will be guarded by a private security officer during non-working hours.

Figure 2-2 On-site Organizational Chart



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2.4 Site Activities and Preparation Procedures

A team kickoff meeting will be conducted before fieldwork begins to review the workplan, personnel responsibilities, site and project logistics, ordnance removal procedures and safety considerations. An initial safety briefing will be conducted before any site work begins. Daily safety briefings will be conducted during the duration of the project.

2.4.1 Excavated Soil Staging Area

An area adjacent to the nine grids will be used as a staging area for soil stripped off the nine grids. Before site work begins, the staging area will be leveled and surveyed. The surveyed elevations will act as a "not-to-exceed" reference depth during the excavation and sifting operations.

2.4.2 Brush Cutting

Minimal brush cutting is anticipated on-site as the area has been previously cleared of vegetation. It is anticipated no tree larger than four inches in diameter will be removed from the site. However, if removal of larger trees is deemed necessary, ZAPATAENGINEERING will seek USAESCH approval. Any brush cutting deemed necessary will be conducted during the fieldwork. UXO workers will provide escort and perform surface searches in areas requiring brush cutting. Brush will be trimmed only to the extent necessary to safely perform UXO operations. Power tools, such as chainsaws and weed eaters, and brush cutters may be used in addition to hand tools for this operation. In the event brush cutting is deemed necessary during the surface soil removal and sifting, the remotely operated equipment will be stopped and time will be allowed to cut and remove site vegetation.

2.4.3 Geophysical Test Grids

No digital geophysical data will be recorded during the fieldwork; therefore, a geophysical prove-out is not required. The EM-61 hand-held sensors will be field tested daily before site operations begin to ensure the instruments are functioning as designed. A test grid will be installed at the office trailer location that will include 60mm, 81mm and 105mm simulants buried at various depths.

2.4.4 Surface Sweeps

Numerous surface and subsurface clearances have been conducted in OOU6. The uppermost soil in the nine grids within OOU6 contains large amounts of metallic debris and has prevented complete near-surface ordnance removal. Therefore, traditional surface sweeps will be conducted only in small areas where surveying or brush cutting activities will be conducted.

2.4.4.1 In order to effectively remove potential surface ordnance items and metallic clutter over the entire nine-grid area, the USAFRL D-8 dozer will be operated remotely and will scrape off and sift the top eight to twelve inches of soil, precluding additional surface clearance activities. The uppermost soil will be stockpiled and sifted. OE items sifted out of the uppermost soil will be handled on a case-by-case basis. In general, if an OE item is discovered in the sifter in the material larger than two inches, the item will be removed from the screen by remotely operated

equipment. Once removed from the screen, the item will be picked up, moved by the excavator and placed in a location that allows for safe detonation procedures.

2.5 Subsurface Removal

The upper eight to twelve inches of soil will be sifted through a mechanical shaker using a two-inch square screen. OE components larger than two inches will be separated from smaller items and the soil, and properly disposed as described in the following OE scrap management plan. The sifter will be checked with a camera mounted on the excavator. If necessary, sifting operations will be paused and the shaker checked for suspected UXO or OE components. Sifted soil will be removed from the shaker and moved to a clean holding area.

2.5.1 Once the uppermost soil has been removed from the nine-grid area, a UXO team will conduct subsurface removal activities. The UXO team will search the nine-grid area to a depth of no more than four feet from the initial ground elevation. Subsurface searches will be conducted using an EM 61 hand-held sensor. The UXO team will conduct the subsurface searches during breaks in bulldozing, excavation and sifting operations. The UXO team will excavate all ordnance-like items (in size and shape) as distinguished by the EM-61's audible signal.

2.5.2 Only qualified UXO personnel will be allowed within the exclusion zone during the excavation and sifting operation and subsurface investigations. All unnecessary personnel will remain outside of the identified safety zones. The UXO Supervisor (UXOS) will record the types, amounts and disposition of the OE/UXO located during the excavation and sifting operation and subsurface investigation.

2.6 Procedures for Reporting and Disposition of UXO

The UXOS will provide a detailed summary of all soil sifted, ordnance, ammunition, explosive items, components and scrap encountered in each grid to the team's SUXOS. The summary will include the quantity, location, type, depth, condition and final disposition of all items located in each area searched. Item summaries will also be generated on a daily basis for all OE materials removed during the sifting operation. Details of items discovered in the sifter will be limited to quantity, type, condition and final disposition.

2.6.0.1 All item summary reports will be turned over to the UXO QC at the end of each workday. The UXO QC will verify the accuracy and completeness of all reports. Any corrections or clarifications will be made and approved by the initiating UXOS before it is delivered to the task manager and approved for input into the site database. Boundary marking stakes will not be removed until that area has received QC approval by ZAPATAENGINEERING and QA certification by the on-site USAESCH Safety Specialist.

2.6.1 Team Personnel Responsibilities

Personnel from ZAPATAENGINEERING and HFA will represent the ZAPATAENGINEERING team on-site. As the prime contractor, ZAPATAENGINEERING will oversee the work effort with support from HFA. Each team member will provide a crucial role in the removal action process. Additional project support and direction will come from team members not present in the field.

2.6.1.1 Project Manager (PM)

Mr. Ed Henson, A.I.A. is responsible for ensuring execution of the project in a timely and cost effective manner. He is responsible for communicating with the USAESCH Project Manager, oversight of overall performance of the project team, coordinating all contract and subcontract work and resolving problems. His responsibilities include monitoring adherence to the project schedule and overall management of the project budget, including assurance that subcontractor costs are within budget.

2.6.1.2 Task Manager (TM)

Mr. Jason Shiflet, P.G. is responsible for the day-to-day management and execution of the project field operations and personnel. Daily duties include technical review and scheduling, coordinating and monitoring of subcontractor field activities and enforcing compliance with the workplan and SSHP.

2.6.1.3 Senior UXO Supervisor (SUXOS)

Mr. Robert Raesemann, with HFA, is responsible for the day-to-day on-site management of UXO services. His responsibilities include coordination and direction of all UXO site operations. Two SUXOS may be assigned to this project if a seven-day per week work schedule is required.

2.6.1.4 UXO Quality Control/Site Safety Officers (UXO QC/SO)

Messrs. Chris Rose and T.J. Die are responsible for quality control of all site activities performed by HFA and required by USAESCH. They will be responsible to the ZAPATAENGINEERING PM for project quality control, which includes administering the program and coordinating directly with the SUXOS. They are also responsible for maintaining the site inventory of government and HFA equipment.

2.6.1.4.1 In addition, they have the responsibility for ensuring site safety and compliance with the safety provisions of the WP and SSHP. They have the on-site responsibility and authority to modify and/or halt work, and to remove personnel from the site if working conditions that may affect on-site/off-site safety and health change. They are the main contact for any on-site emergency. They may modify the approved SSHP only after consultation with the team management and subcontractor safety officers and concurrence of the USAESCH Contracting Officer, except when necessitated by an emergency.

2.6.1.5 UXO Supervisor

Mr. Mark Lewis, with HFA, is responsible for his team's operations, ensuring personnel compliance with safety and Personal Protective Equipment (PPE) requirements, monitoring working conditions, notification of the UXO QC/SO or SUXOS of any unsafe condition, ordnance, ammunition and explosives, or UXO located within his team's operating zone. The UXOS also has the authority to stop operations in his zone if any unsafe act or condition exists.

2.6.2 UXO Identification

If a located item is suspected to be UXO, it will be identified and classified. If a suspected OE/UXO item cannot immediately and positively be identified by the UXOS, he will request

assistance from the UXO QC/SO, the Senior UXO Supervisor (SUXOS), or the on-site USAESCH Safety Specialist. The on-site USAESCH safety specialist will determine the disposition of the suspect UXO and whether the item is safe to move or should be detonated in place. All located and positively identified UXO will be marked with crossed red pin flags.

2.6.3 UXO and Demolition Materials Transportation

UXO or suspected UXO determined to be unsafe to move, will not be transported in the performance of this removal effort. UXO/OE considered safe to move will be consolidated within the investigation grid.

2.6.3.1 The SUXOS, UXO QC/SO or UXOS will escort all movement of demolition explosives. Explosives will be transported only on designated routes and at the posted speed limits. When transporting explosives, UXO or OE, the driver may not exceed a safe and reasonable speed.

2.6.3.2 All demolition materials will be loaded and transported according to local, state, and federal regulations. All loads will be visually inspected by the SUXOS or the UXO QC/SO to ensure they are properly secured and safe to move.

2.6.3.3 Vehicles transporting explosives will be placarded with a Department of Transportation "Explosives Class 1.1" placard or placarded as directed by local regulations. Class 1.1 consists of explosives that have a mass explosion hazard.

2.6.3.4 Blasting caps and demolition materials will be placed in suitable, separate metal containers. The containers will be secured to prevent movement during transportation. The internal space of the container will be padded and the largest distance possible will separate the boxes in the bed of the truck. The containers will remain closed at all times, unless removing or replacing the materials. All demolition explosives and OE/UXO will be inventoried and accounted for before performing any demolition operation.

2.6.4 UXO Safe Holding Areas

A safe holding area will be identified for any UXO/OE to be blown-in-place or determined safe to move during the sifting operation. This area will be at least 200 feet from any site operations and visibly marked. These UXO/OE items will be stored in an area identified and agreed upon by the SUXOS, the UXO QC/SO and the USAESCH Safety Specialist. Before the end of each workday all UXO/OE will be disposed of through open detonation. In the unlikely event items cannot be destroyed the same day they are discovered, on-site security will be notified and explicit instructions given not to approach or allow any non-UXO personnel into the area. Disposal will occur the following day, weather permitting.

2.6.5 UXO Demolition and Post-demolition Procedures

Demolition safety and operations will be conducted according to the standard practices and procedures outlined in TM 60A-1-1-31. OE/UXO will only be detonated after positive identification. Electrical procedures will be employed as the method of choice for all detonations and all demolition shots will be tamped.

2.6.5.0.1 Demolition operations, if required, will take place at the end of each workday. The SUXOS is responsible for determining whether minimum safe conditions to conduct demolition operations are met. If an event such as inclement weather prevents the destruction of any UXO, arrangements will be made to provide security for the site. HFA personnel will provide perimeter security during demolition operations. The personnel safe separation distance for demolition operations, based on HNC-ED-CS-S-9-7, is the greater of the sandbag throw distance for the detonated OE item or 200 feet.

2.6.5.1 Detonating UXO in Place

All detonations will be conducted according to TM 60A-1-1-31. Detonations will take place only after all unauthorized personnel have left the area and perimeter security has been posted.

2.6.5.1.1 The composition of the Demolition Team will be determined by the SUXOS. The team will be composed of qualified UXO personnel under the direct supervision of a UXOS who is the designated blaster. The remaining HFA UXO personnel will act as perimeter security, if required.

2.6.5.1.2 Notification of detonations will be made according to the Standard Operating Procedures for Notification of UXO Detonations identified in the previously approved Work Plan. All detonations will be tamped with sandbags, in accordance with HNC-ED-CS-S-98-7. During detonations, a designated project vehicle will remain in the safe area to provide emergency egress for the demolition team.

2.6.5.1.3 The Demolition Team, SUXOS, UXO QC/SO and the on-site USAESCH Safety Specialist are the only personnel allowed 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.

2.6.5.1.4 All demolition materials will be accounted for by the UXOS and reported to the SUXOS. Only the amount of demolition material required to complete that day's operations will be drawn from the magazines and transported to the site. The area where demolition operations are being conducted will remain secured until the SUXOS or UXO QC/SO gives the "all clear" signal.

2.6.5.1.5 After each detonation, the detonation points will be inspected by the UXOS and the SUXOS or UXO QC/SO to ensure that a misfire, low order detonation or a kick out has not occurred.

2.6.5.1.6 All charges will be dual primed and initiated electrically. Detonating cord trunk and branch lines will be used to link multiple shots. Jet perforators will be used in the event that venting of OE related scrap is required.

2.6.5.2 Demolition Procedures

The demolition procedures to be used at OOU6 will be conducted in accordance with the approved HFA workplan except where noted below.

2.6.5.2.1 From the approved HFA workplan, paragraph 4.3.10.3.10.1, sub item A), the sentence should be altered as follows, "The caps will be placed at least 25 50 feet from the charge, under protective sandbags, while performing this test."

2.7 OE and Non-OE Scrap Management Procedures

Scrap removal is essential to successfully complete subsurface searches. Scrap is defined as metallic debris that is not contaminated with explosives. Scrap can be ordnance-related material as long as it has been inspected to determine that it does not contain explosives or explosive residue and the case is vented to prevent a mechanical rupture if the item were placed in a melting furnace.

2.7.1 OE-related scrap certification will be an ongoing process throughout the project. All OE scrap will be inspected before removal from the site. A four-step visual inspection process conducted by the UXOS, UXO QC/SO and SUXOS confirms that all inert OE and OE-related scrap is free of any explosive contamination and explosive residue.

2.7.2 A final inspection of the scrap will be made by the SUXOS and the UXO QC/SO, after which the SUXOS will sign a certificate stating that "The property listed hereon has been inspected by me, and to the best of my knowledge and belief, contains no items of a dangerous nature." All material will be accounted for in the daily and weekly reports. Disposal documentation receipts will be generated identifying the day of off-site removal, approximate scrap weight and signature of the recipient.

2.7.3 The scrap will be segregated into ordnance related and non-ordnance related scrap. All inert OE and OE-related scrap will be visually inspected. If necessary, the items will be vented. A local scrap dealer will be utilized to remove the scrap at no additional cost to the government. All OE-related scrap will be stored in secure locked containers located as directed by SUXOS. Only scrap that has been inspected and certified by the SUXOS and the UXO QC/SO may be stored in secure locked storage containers.

2.8 Final Reporting Plans

ZAPATAENGINEERING will prepare a detailed report of this removal action as an addendum to the Final Removal Report by UXB International. The report will fully describe all on-site project activities and findings. A PowerPoint® presentation will be prepared for presentation to the local community and interested government agencies.

2.8.1 ZAPATAENGINEERING will also produce a professional-quality video that will fully document activities conducted on-site during this OE removal operation. The video will include a voice-over explaining the scenes.

3.0 EXPLOSIVES MANAGEMENT PLAN

This plan has been prepared in accordance with the basic contract, local and state laws and regulations, ATF P 5400.7(6/90), DOD 6055.9-STD and DOT regulations.

3.1 Licenses/Permits

HFA will acquire all required federal and state permits. Licenses or permits issued under this section or a copy of a license or permit will be posted and available for inspection on each project site location where explosives materials are used.

3.2 Acquisition

HFA will procure and use explosives in the quantities listed below:

1. Jet Perforators (40)
2. Electric Blasting Caps (100)
3. 80 gr/ft Detonating Cord (2,000 feet)

All explosives will be purchased from and shipped by commercial sources.

3.3 Initial Receipt

Upon initial receipt of a shipment of explosives, each container of material will be inspected and inventoried. The contents of the shipment will be verified based on the quantity and type of material ordered, as indicated on the invoice, shipping documents, or bills of lading. Discrepancies will be immediately reported to the supplier/shipper and reconciled.

3.3.1 All original receipts, shipping documents or invoices will be retained on-site as part of the site's records. Upon receipt of the explosive materials shipment, copies of the documentation will be sent to HFA's Waldorf, Maryland office within three working days. At the completion of the project, the original documents will be sent to the Waldorf office, where they will be maintained for a period of five years. Copies of the documentation will be included in the final report.

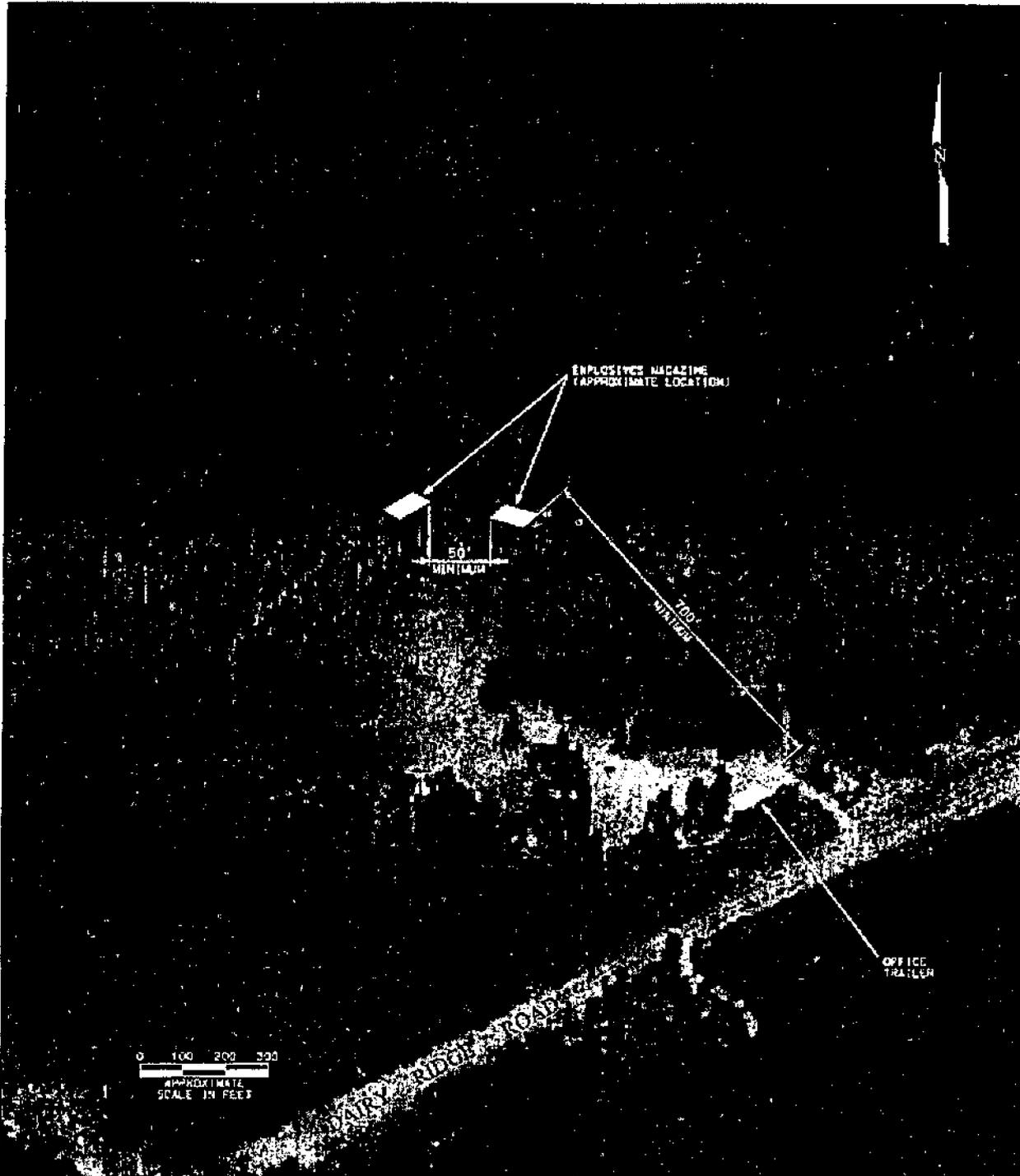
3.4 Storage

Portable explosive storage magazines will be utilized on this project. One magazine will hold the detonating cord and the jet perforators, while the other magazines will hold the blasting caps. The explosive magazines location map, Figure 3-1, shows the locations of the magazines in relation to the office trailer site.

3.4.0.1 Magazine construction is in accordance with DOD 6055.9 STD regulations. Each door will be equipped with one of the following locks:

1. Padlock, Key Operated, High Security; 5 – Pin
2. Padlock, Key Operated, High Security; 5 – Blade
3. HI SHEAR LK1200, High Security Padlock.

Figure 3-1 Explosives Magazine Location Map



ZAPATA ENGINEERING TRUST • INTEGRITY • QUALITY <small>1401 W. 10TH ST. SUITE 100 FORT WORTH, TX 76102 PHONE: (817) 338-1000 FAX: (817) 338-1001 WWW.ZAPATAENGINEERING.COM</small>	 US ARMY ENGINEERING & SUPPORT CENTER BENNING, ALABAMA	FORMER CAMP CROFT OFFICERS' TR EXPLOSIVE MAGAZINE LOCATION MAP			
		DRAWN BY: R.A. CHECKED BY: J. DAVIS	PROJECT #1: ZFG-8700	DATE: 1-12-2001	DRAWN BY: R.A.

3.4.0.2 Property upon which magazines are located will be posted with signs in accordance with the local fire department requirements. If required, such signs will be located so as to minimize the possibility of a bullet traveling in the direction of the magazine if anyone should shoot at the sign. If required, hazard identification for fire fighting personnel (indicated by a distinctive symbol in order to be recognized by the fire fighters approaching the fire scene) will be displayed. 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 be placed on the outside of the magazines.

3.4.0.3 Packages of explosives stored within the magazine will be laid flat with top up. Corresponding grades or brands will be stored together in such a manner that brands/grade marks show, and they are easily counted and checked, and stacked in a stable manner. Packages of explosives will not be unpacked or repacked in a magazine or within 50 feet of a magazine. Tools used for opening packages of explosives shall be constructed of non-sparking materials. Open packages of explosives will be securely closed before being returned to the magazine.

3.4.0.4 Smoking, matches, open flames, spark-producing devices, and firearms will not be permitted inside of or within 50 feet of magazines. The land surrounding the magazines will be kept clear of all combustible materials for a distance of at least 25 feet. Combustible materials will not be stored within 50 feet of magazines.

3.4.1 Physical security of storage facilities

The magazine storage area will be secured in a fenced area with a locking gate. The fenced area will be monitored by private security services.

3.5 Establishment of Quantity of Explosives and Fragmentation Distances

Explosive used for demolition operations will be separated into two separate magazines of the proposed explosive storage area. One magazine will hold the detonating cord, PETN boosters, and the jet perforators, with the other magazine will contain the blasting caps. The type, amount, class and net explosive weight (NEW) of explosive materials HFA will be storing in the explosive storage area are listed in Table 3-1.

Table 3-1 Demolition Explosives

Description	Class/Division	Quantity	NEW	Storage Compatibility Group
Electric Blasting Caps	1.1	100 ea	Less than 1 lb	B
Jet Perforators (shaped charge)	1.4	40 ea	26.81 lbs	D
Detonating Cord (80 gr/ft)	1.1	2,000 ft	22.0 lbs	D

3.5.1 Based on DOD Ammunition and Explosives Safety Standards (DOD 6055.9-STD, C9.3.1.1) for less than 100 pounds net explosive weight of Class 1.1 explosives, the required

safe separation distance in feet to inhabited buildings is 670 feet. The required safe separation distance for public traffic is 402 feet.

3.6 Lightning Protection

DOD 6055.9 requires lightning protection on buildings and structures used for processing, handling, or storage of explosives, ammunition, explosive ingredients, and other hazardous materials where operations cannot be shut down during electrical storms or in areas with more than five thunderstorm days per year. The explosives magazines will have lightning protection per above-mentioned requirements.

3.7 Transportation

On site transportation of explosives from the magazines to the demolition location(s), will be accomplished by designated pick-up trucks. Blasting caps and high explosives will remain separated by the largest distance possible in the bed of the truck at all times during transport.

3.7.1 Vehicle Requirements

Vehicles used to transport explosives will have substantially constructed bodies with no sparking metal exposed in the cargo space and will be equipped with suitable sides and tail gates. During transportation, explosives will not be piled higher than the sides or end of the truck bed.

3.7.1.1 Vehicles containing explosives or detonators will display the proper warning signs, be maintained in good condition and operated at a safe speed, in accordance with all safe operating practices. Other materials or supplies will not be placed on or in the cargo space of a conveyance containing explosives, detonating cord, or detonators, except for safety fuse and except for properly secured non-sparking equipment used expressly in the handling of such explosives, detonating cord, or detonators. Explosives or detonators will be transported promptly without delays in transit. Explosives or detonators will be transported at times and over routes that expose a minimum number of persons. Only the necessary attendants will ride on or in vehicles containing explosives or detonators. Vehicles will be attended, whenever practical and possible, while loaded with explosives or detonators.

3.7.1.2 When vehicles containing explosives or detonators are parked, the brakes will be set and the motor shut off. After the vehicles has been secured, the IME Specification 22 cap-box and the containers containing the explosives will be removed from the bed of the truck and placed on the ground, prior to any explosives being removed from the containers.

3.7.1.3 The motor vehicle used for transporting explosives will have the following minimum safety equipment:

1. Fire extinguisher
2. Non-metallic bed liner
3. Flame retardant cover or metal containers

Metal containers such as IME boxes or other suitable metal containers with latching lids, and appropriate padding, may be used in place of a flame retardant cover.

3.8 Issue/Receipt Procedures

Upon receipt of explosives, and after validation, a magazine data card (See Figure 3-2) will be completed for each type of explosive stored at the project site. Items on the card, such as Department Of Defense Identification Codes (DODICs) or federal stock numbers that do not apply to commercial explosives, will not be completed. Whenever explosives stocks are re-supplied, inventoried or issued, the action will be noted in the appropriate block(s) of the card.

3.8.1 Whenever a card is completely filled in, a new card will be started and the old one retained as part of the official record, and submitted with the final report.

3.8.2 Quantities of explosive materials that are left over at the end of the project will be turned over to the Spartanburg County Bomb Squad and will be so noted on the magazine card. A copy of the card will be shipped with the material to the new site and the original will be sent to HFA's Waldorf, Maryland office for the explosive accountability logs.

3.8.3 If the explosives are to be disposed of by detonation or burning, an inventory of all material will be made by the SUXOS. The UXO QC/SO will witness the destruction of the material. A Memorandum For the Record (MFR), signed by the above persons, will be written documenting the inventory and destruction of the explosives. This document will become a part of the official site record and will be included in the final report.

3.8.4 The SUXOS will be responsible for the initial receipt, control and issue of all explosives used on site for disposal of UXO or OE. The UXO QC/SO will observe and document all on-site explosives transactions in the field logbook.

3.8.5 The SUXOS or the UXO QC/SO will observe all demolition setups and shots to verify that all explosives issued were in fact used and consumed. An "Explosives Consumption Certificate" (See Figure 3-3) will be completed by the SUXOS and included in the Weekly Reports.

3.8.6 Unused "daily issued" explosives will be returned to the magazine. Explosives will be returned in their original container. The quantities will be indicated on the magazine card, and the receipt document will be annotated to indicate the type and quantities of explosives returned to storage.

3.8.7 HFA, as the end user of the site explosives, will provide a letter certifying that the explosives were used for their intended purpose to ZAPATAENGINEERING. ZAPATAENGINEERING will forward the letter to the USAESCH contracting officer at the end of the project. This document will also be made a part of the final report.

3.9 Inventory

An inventory will be conducted weekly, normally on the last workday of the week. The SUXOS will be responsible for performing and documenting the inventory.

3.9.1 Procedures for physical inventory of storage facility

Each item of explosive will be counted. Unbroken cases do not require opening unless there is evidence that the original packaging was disturbed. The magazine card, Figure 3-2, will be completed and submitted to the SUXOS. The SUXOS will indicate in the daily journal, the fact that an inventory was conducted that day and the results.

3.9.2 Procedures for reconciling discrepancies from inventory

Issue/Receipt forms and magazine inventories will be reconciled weekly when the magazine contents are inventoried.

3.10 Procedures upon discovery of lost, stolen or unauthorized use of explosives

Theft or loss of explosives will be reported as required in 27 CFR Part 55, Subpart C, paragraph 55.30. A Report of Theft or Loss – Explosive Materials, ATF Form 5400.5, will be completed and forwarded within 24 hours to the ATF, with a copy to the USAESCH Contracting Officer. A copy of ATF Form 5400.5 is provided in Figure 3-4. The following persons will be notified immediately upon discovery of theft or loss of explosive:

1. ZAPATAENGINEERING's Project Manager, Ed Henson, 1-704-358-8240
2. Spartanburg County Sheriff's Department, 1-864-596-2222
3. The Bureau of Alcohol, Tobacco and Firearms, 1-800-800-3855
4. HFA's home office, 1-301-705-5044

3.11 Procedures for disposing of remaining explosives

Any explosives not consumed will be disposed of through open detonation or turned over to the local Sheriff's Department. If explosives are turned over to the Sheriff's Department, a signed receipt will be required indicating the person accepting the explosives, the date and quantities.

Figure 3-4 ATF Form 5400.5

Form Approved: OMB No. 1517-0185 (07/81/85)

DEPARTMENT OF THE TREASURY BUREAU OF ALCOHOL, TOBACCO AND FIREARMS REPORT OF THEFT OR LOSS-EXPLOSIVE MATERIALS		DATE		
<p>Upon discovery of any theft or loss of any of your explosive materials: -First, call ATF toll free at 1-800-800-3855 (or call ATF collect at 1-800-800-3855 if you are in Alaska, Guam, Hawaii, Puerto Rico or the Virgin Islands) to report the theft or loss; -Second, call your local law enforcement office to report the theft or loss; and -Third, complete this form and attach any additional sheets or invoices necessary to provide the required information, and mail to the nearest ATF office listed on the reverse. We suggest you retain a copy of the completed form. Please complete each item, as applicable, to the best of your ability. NOTE: Section 842(k), 18 U.S.C., Chapter 40, states, "It shall be unlawful for any person who has knowledge of the theft or loss of any explosive materials from his stock to fail to report such theft or loss within twenty-four hours of discovery thereof to the Secretary and to appropriate local authorities." Codified at 27 C.F.R., Section 55.30.</p>				
1. NAME, ADDRESS AND TELEPHONE NUMBER OF PERSON MAKING REPORT (Include corporate or business name, if applicable)		2. LOCATION OF THEFT OR LOSS (If different from item 1)		
3. THEFT OR LOSS	DATE		TIME	
a. DISCOVERED				
b. OCCURRED (Show approximate if exact not known)				
c. REPORTED TO ATF BY TELEPHONE			4. NAME AND ADDRESS OF LOCAL AUTHORITY TO WHOM REPORTED	
d. REPORTED TO LOCAL AUTHORITIES				
5. EXPLOSIVE MATERIALS LOST OR STOLEN (Attach invoices or additional sheets, if necessary)				
a. MANUFACTURER OR BRAND NAME (Include date and shift code)	b. QUANTITY (Pounds of Explosives, Number of Caps)	c. TYPE AND DESCRIPTION (Dynamite, Blasting Agents, Detonators, etc. Include for each type, size, MS delay or length of legwire, as applicable)		
6. THEFT OR LOSS OCCURRED FROM (Check applicable box)				
<input type="checkbox"/> PERMANENT MAGAZINE	<input type="checkbox"/> PORTABLE MAGAZINE	<input type="checkbox"/> TRUCK	<input type="checkbox"/> WORK SITE	<input type="checkbox"/> OTHER (Explain)
7. ENTRY TO MAGAZINE MADE THROUGH (Complete if applicable)		8. NUMBER AND TYPE OF LOCKS FORCED (Complete if applicable)		
<input type="checkbox"/> DOOR	<input type="checkbox"/> ROOF	<input type="checkbox"/> FLOOR	<input type="checkbox"/> FOUNDATION	
<input type="checkbox"/> WALL	<input type="checkbox"/> CEILING	<input type="checkbox"/> VENTS	<input type="checkbox"/> OTHER (Explain)	
9. OTHER INFORMATION PERTINENT TO THE THEFT OR LOSS				
10. SIGNATURE AND TITLE OF PERSON MAKING REPORT		11. FEDERAL EXPLOSIVES LICENSE OR PERMIT, IF ANY		
FOR ATF USE ONLY				
DATE RECEIVED	TIME RECEIVED	UNIQUE IDENTIFIER		
ATF F 5400.5 (1-83) PREVIOUS EDITIONS ARE OBSOLETE				

Form 3-4 ATF Form 5400.5 (con't.)

ADDRESS LISTING OF ATF OFFICES

Forward this completed form to the nearest ATF Office listed below (alphabetically by City):

- | | |
|---|---|
| 1) 101 Marietta St., NW, Ste. 406
Atlanta, GA 30303 | 12) 350 S. Figueroa Street, Ste. 800
Los Angeles, CA 90071 |
| 2) 103 South Gay St., 2nd Floor
Baltimore, MD 21202 | 13) Bank of Louisville Bldg.
510 West Broadway, Ste. 807
Louisville, KY 40202 |
| 3) 2121 8th Ave. N., Rm. 725
Birmingham, AL 35203 | 14) 8420 NW 52nd St., Ste. 120
Miami, FL 33166 |
| 4) The Boston Federal Building
10 Causeway St., Rm. 701
Boston, MA 02222-1081 | 15) Nashville Koper Center
215 Centerview Dr., Ste. 215
Brentwood, TN 37027 |
| 5) 4530 Park Road, Ste. 400
Charlotte, NC 28209 | 16) Executive Plaza Bldg., Ste. 308
10001 Lake Forest Blvd.
New Orleans, LA 70127 |
| 6) 1 South 450 Summit Ave., Ste. 250
Oak Brook Terrace, IL 60181 | 17) 90 Church St., Rm. 1016
New York, NY 10007 |
| 7) Plaza South One, Rm. 301
7521 Engle Road
Middleburg Hgts, OH 44130 | 18) US Customs House, Rm. 504
2nd & Chestnut Streets
Philadelphia, PA 19106 |
| 8) 1200 Main Tower Bldg., Ste. 2550
Dallas, TX 75280 | 19) 221 Main Street, Ste. 1250
San Francisco, CA 94105 |
| 9) 231 W. Lafayette St., Rm. 533
Detroit, MI 48226 | 20) 915 2nd Avenue, Rm. 805
Seattle, WA 98174 |
| 10) 15355 Vantage Pkwy West, Ste. 210
Houston, TX 77032 | 21) 100 South 4th Street, Ste. 550
St. Louis, MO 63102 |
| 11) 811 Grand Ave., Rm. 105
Kansas City, MO 64106 | 22) 1870 Minnesota World Trade Center
30 East Seventh Street
St. Paul, MN 55101 |
| | 23) 607 14th Street, NW, Ste. 620
Washington, DC 20005 |

PRIVACY ACT INFORMATION

The following information is provided pursuant to section 3 of the Privacy Act of 1974 (5 U.S.C. § 522a(e)(3)).

- 1. Authority.** Solicitation of this information is made pursuant to Title XI of the Organized Crime Control Act of 1970 (18 U.S.C. Chapter 40). Disclosure of a theft or loss of explosive materials is mandatory pursuant to 18 U.S.C. § 842(k) for any person who has knowledge of such theft or loss from his stock.
- 2. Purpose.** The purpose for the collection of this information is to give ATF notice of the theft or loss of explosive materials, and to furnish ATF with the pertinent facts surrounding such theft or loss. In addition, the information is used to confirm and verify prior notification of this theft or loss of explosive materials.

- 3. Routine Uses.** The information will be used by ATF to aid in the administration of laws within its jurisdiction concerning the regulation of explosive materials and other related areas. In addition, the information may be disclosed to other Federal, State, foreign, and local law enforcement of laws within their jurisdiction.
- 4. Effects of not supplying information requested.** 18 U.S.C. § 842(k) makes it unlawful for any person, who has knowledge of the theft or loss of explosive materials from his stock, to fail to report such theft or loss within twenty-four hours of discovery thereof, to the Secretary and to appropriate local authorities. The penalty for violation of this section is a fine of not more than \$1,000 or imprisonment for not more than one year, or both. 18 U.S.C. § 844(b).

PAPERWORK REDUCTION ACT NOTICE

This request in accordance with the Paperwork Reduction Act of 1996. The purpose of this information collection is to report the theft or loss of explosive materials. The information is used for investigative purposes by ATF officials. This information is mandatory by statute. (18 U.S.C. 842)

The estimated average burden associated with this collection of information is 1 hour and 48 minutes per respondent or recordkeeper, depending on individual circumstances. Comments concerning the accuracy of this burden estimate and suggestions for reducing this burden should be addressed to Reports Management Officer, Document Services Branch, Bureau of Alcohol, Tobacco and Firearms, Washington, DC 20226.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

ATF F 5400.5 (1-89)

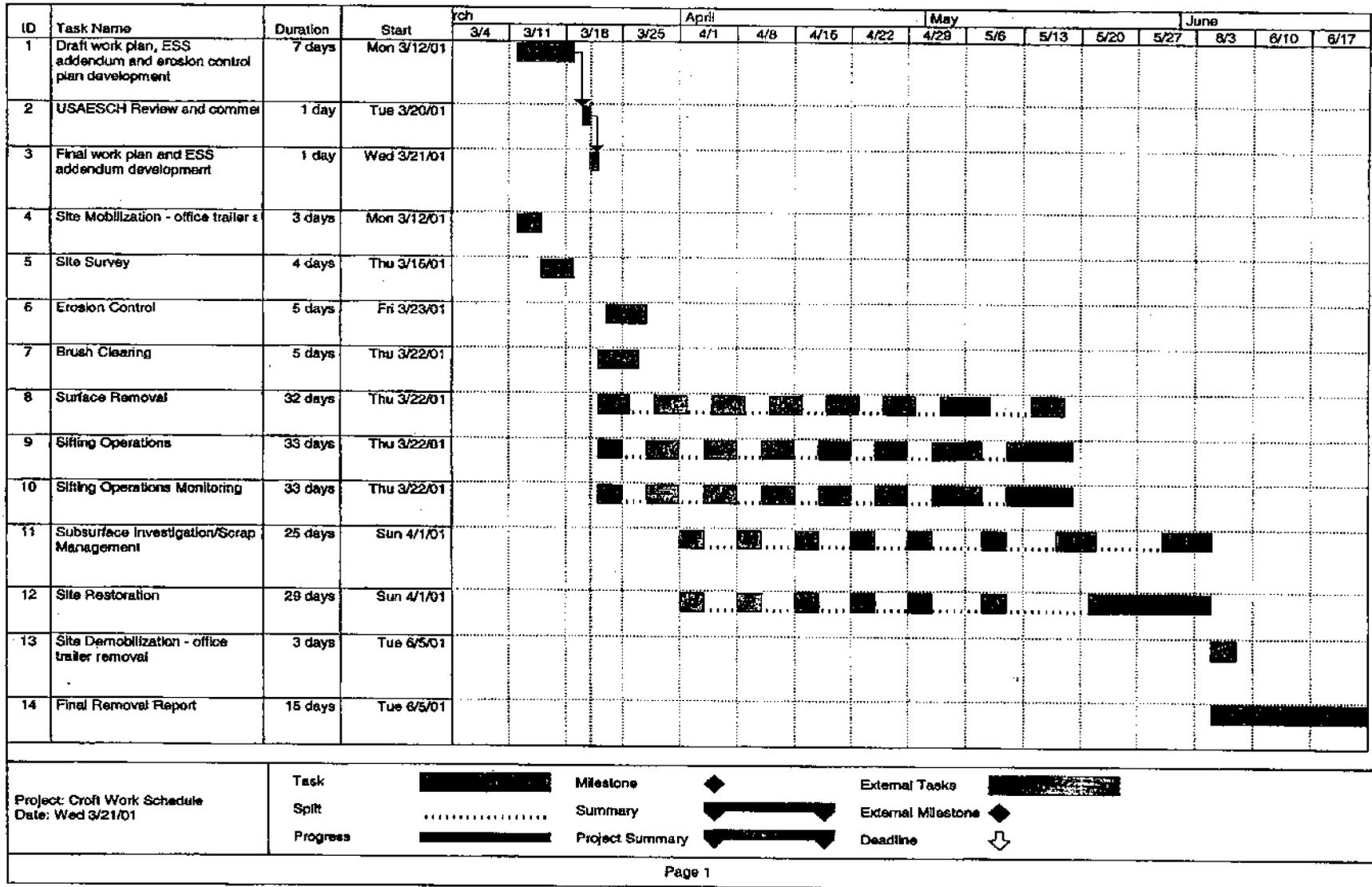
4.0 LOCATION SURVEYS AND MAPPING PLAN

Initial site preparation activities will include topographic surveys and site boundary delineation. A registered land surveyor from BP Barber and Associates of Spartanburg, SC, will conduct the site survey. Elevation markers will be established in and around the nine contiguous grids as a reference point for excavation depths during the bulldozing phase. The excavated-soil staging area and a corridor connecting the nine-grid area with the staging area will also be surveyed to obtain a baseline elevation for final site restoration activities. The UXO Safety Officer will accompany the surveyor while on-site.

5.0 WORK, DATA AND COST MANAGEMENT PLAN

The Project Manager is responsible for ensuring execution of the project in a timely and cost-effective manner. This will be accomplished by continual tracking of productivity and expenditures. The UXO QC/SO will submit weekly field reports to the Project Manager describing the level of effort by all on-site personnel and purchases. The Project Manager will evaluate these data against the negotiated schedule and budget. This will allow potential costs and/or schedule variances to be identified early and corrective actions implemented. Analysis of budget and schedule will be reported to the USAESCH Project Manager on a weekly basis. Refer to Figure 5-1 for the project schedule.

Figure 5-1 Project Schedule



6.0 PROPERTY MANAGEMENT PLAN

ZAPATAENGINEERING has a property management system in place for tracking of all equipment purchases. Each purchased item is identified as either consumable or non-consumable. Each item is identified with a project-specific identification number and is dedicated to that project. ZAPATAENGINEERING adheres to the property acquisition, inventory, tracking and reporting requirements mandated by the USAESCH. At the conclusion of the project, item disposition is evaluated. Leased equipment is returned to the lessor. Purchased equipment is evaluated for performance, and then remitted to the USAESCH. In the event the equipment is required for use under another contract task order, ZAPATAENGINEERING will coordinate with the USAESCH for transfer. Refer to Appendix 11.5 for the project equipment list.

6.1 Prior to site work, the ZAPATAENGINEERING Property Manager evaluates subcontractors's property management plan and requests a copy of their respective equipment lists. Once on-site, the Task Manager will compare the items identified on their list to the equipment at the project site. In the event of discrepancies, the subcontractor will be requested to clarify.

7.0 QUALITY CONTROL PLAN

7.1 Commitment to Quality

This plan outlines ZAPATAENGINEERING's policies and procedures and how they respond to the requirements of USAESCH DID OE-005-11 (Quality Control Plan), Department of the Army EP 11101-18 (Ordnance and Explosives Response, 24 April 2000) and Department of the Army EM 1110-1-4009 (Ordnance and Explosives Response, 23 June 2000). Implementation of these polices ensures that we are following the ZAPATAENGINEERING Quality Management System and that we consistently meet the quality and performance requirements of our clients in a timely and cost-effective manner.

7.1.1 ZAPATAENGINEERING is solely responsible for controlling the process and product quality and offering to submit for acceptance, only products and services determined to conform to contractual requirements.

7.2 ZAPATAENGINEERING's Quality Policy

ZAPATAENGINEERING will provide quality products and services that meet or exceed our client's requirements, delivered safely, on time and within budgetary constraints.

7.3 Purpose and Scope

The purpose of this QC plan is to document the approach and procedures to be used to ensure quality throughout the execution of the ordnance and explosives project at OOU6. The plan includes personnel responsibilities, audit procedures and corrective/preventative action procedures

7.4 Data Quality Objectives

For this project, the data quality objectives (DQOs) are as follows:

1. To ensure that the tools, sensors and equipment used to accomplish the work are fully functional and reliable,
2. To ensure that site personnel are fully qualified to perform the tasks in a safe and efficient manner, and
3. To ensure that the results of this process are repeatable and verifiable.

7.5 ZAPATAENGINEERING Personnel Responsibilities

Refer to Figure 7-1 for the Quality Control Organizational Structure.

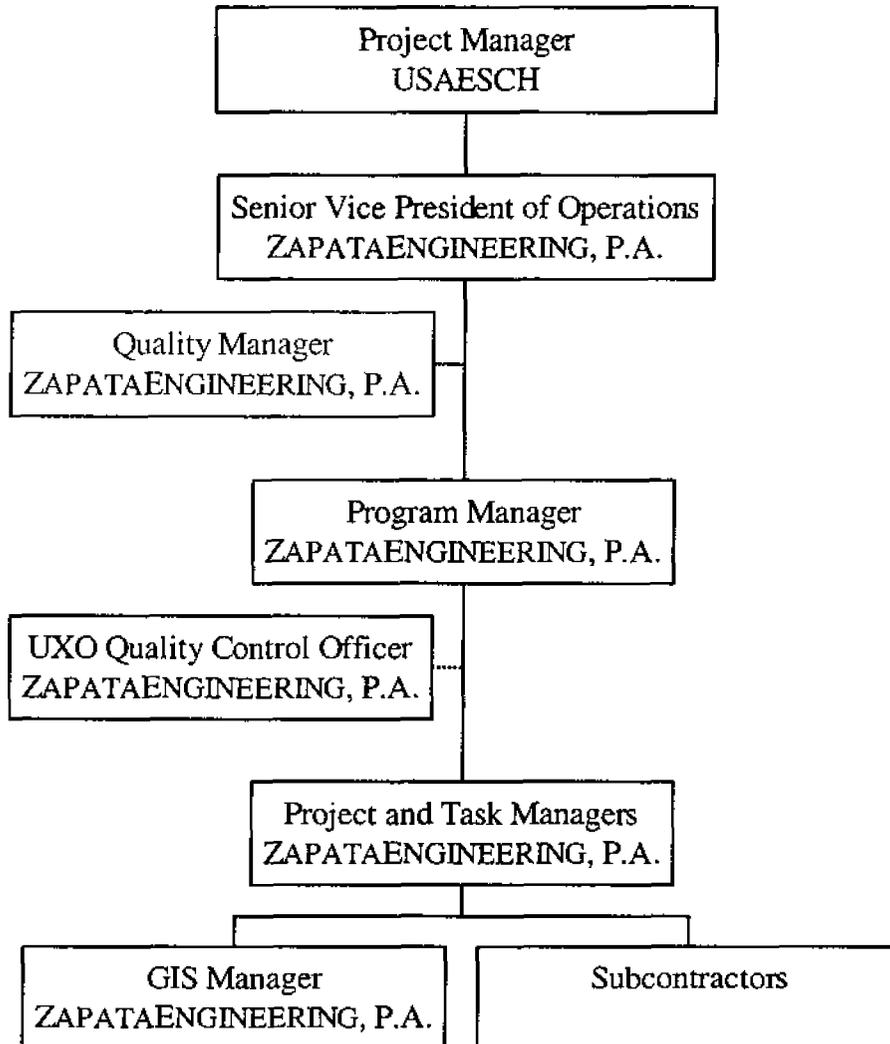
7.5.1 OE Program Manager

- Defines the goals of the QC Plan
- Ensures the communication and understanding of the ZAPATAENGINEERING QC plan throughout the organization as well as all subcontractors

Figure 7-1 Quality Control Organizational Chart:



OOU6 Ordnance Removal
Former Camp Croft
Spartanburg, South Carolina



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7.5.2 Quality Control Manager

- Develops the QC plan and ensures the QC plan is established, implemented and maintained
- Reports on the performance of the QC plan to Program Manager and the Senior Vice President of Operations
- Regularly reviews the suitability and effectiveness of the QC plan

7.5.3 Unexploded Ordnance Quality Control Officer (UXO QC)

- Contributes to the QC plan
- Implements the QC plan in the field
- Conducts QC audits

7.5.4 Project and Task Managers

- Implements, documents and maintains the QC plan
- Maintains the nonconformance, corrective and preventive action systems
- Responds to QC audits
- Coordinates improvements to the QC plan based on suitability reviews
- Obtains and communicates client requirements to the appropriate personnel
- Ensures qualified, skilled and trained personnel and other resources are available to implement the QC plan
- Ensures products and services satisfy client requirements including quality, safety, cost, schedule, performance, reliability, durability, accuracy and maintainability
- Ensures personnel comply with applicable standards, regulations, specifications and documentation procedures

7.5.5 Site Personnel

- Ensure quality of their work
- Operate in conformance with the requirements of the QC plan
- Stop work in progress or make appropriate notifications when unsafe conditions exist or requirements are not being met

7.5.6 US Air Force Research Laboratory Responsibilities

The US Air Force Research Laboratory (USAFRL), Tyndall Air Force Base FL, under separate contract to USAESCH, will use a remotely controlled bulldozer (D-8), excavator, skid-steer loader, and sifter to remove, sift, and stockpile the uppermost eight to twelve inches of soil. Three USAFRL employees will operate the equipment from a control vehicle parked outside the exclusion zone. The bulldozer will skim the surface of the site, removing soil to a design depth of approximately eight to twelve inches.

7.5.7 Human factors Applications

During non-bulldozing and non-sifting workdays, Human Factors Applications (HFA) will conduct "mag and flag" ordnance removal operations within the areas where metallic clutter has been reduced by the USAFRL.

7.6 Subcontractor Corrective Action

ZAPATAENGINEERING's subcontract documents require subcontractors to promptly identify, report and correct any conditions adverse to quality or safety. All personnel are authorized to stop work immediately for situations indicating imminent danger to personnel or property. Budget and schedule considerations will not override safety.

7.6.1 Once an adverse safety or quality condition is identified, documentation of the cause and corrective actions to preclude reoccurrence are required. Subcontract agreements and Workplan Addenda specify procedures for reporting significant conditions adverse to safety, health and quality.

7.6.2 Once a subcontractor problem is identified, he/she will identify in writing to the ZAPATAENGINEERING Project Manager, a disciplined approach to solve the problem. Minimum procedures for corrective action include:

1. Effective handling of client and/or ZAPATAENGINEERING complaints;
2. Investigation of the cause of the problem relating to work effort process and quality system checks and forward a record of the results of the investigation;
3. Determine the corrective action needed to eliminate the problem;
4. Application of controls to ensure that corrective action is taken and that it is effective.

Any corrective action taken to eliminate the causes of actual or potential problems will be appropriate to the magnitude of problems and commensurate with the risks encountered.

7.7 Initial QC Audit

QC audits are performed periodically on all OE operational sites to ensure all systems are functioning as planned. By or under direction of the Quality Manager, management surveillance of the QC program ensures that all operations are performed in accordance with approved workplans. The audit will include a review of all procedures, logs, records, etc. Management audits are necessary to determine discrepancies in information collected or if conditions and practices create the potential for QC problems, so that corrections can be implemented before problems occur.

7.7.0.1 An initial QC and field surveillance audit will be performed within 10 days after field investigation mobilization. Field surveillance will concentrate on sensor survey sweep procedures, proper documentation and checks of survey data for completeness and accuracy. In addition, a daily check of the monitoring records and survey results will be conducted. The Quality Manager will perform the initial audit.

7.7.1 Weekly QC Audit

At least once each workweek, the UXO QC will conduct an audit equivalent in scope to the initial QC audit to ensure compliance with work plans and the SOW. If noncompliance is discovered, a noncompliance form will be completed and given to the ZAPATAENGINEERING Project Manager, and corrective actions, as applicable, will be selected and implemented.

7.7.2 Field QC Management Audit

The ZAPATAENGINEERING Quality Manager may conduct unannounced QC audits during field efforts to ensure compliance with QC protocols and field investigation procedures. QC audits will be performed on all UXO operational sites to ensure all systems are functioning as planned. The audit will include a review of procedures, logs, records, etc. Audit results will be discussed with the ZAPATAENGINEERING Task Manager and UXO QC.

7.7.3 Inspection of Completed Work

HFA will notify the ZAPATAENGINEERING Project Manager when clearance of a grid is completed. The ZAPATAENGINEERING Project Manager will then notify the on-site UXO QC. Thereupon, ZAPATAENGINEERING in coordination with HFA will check a minimum of 25% of each cleared grid using the same instrument as was employed during the removal action. Potential ordnance-like items targeted for removal and subsequent QC are defined as items which produce an audible signal indicative of a metallic item no smaller than four inches in length and one and a half inches in diameter (60mm mortar without tail). ZAPATAENGINEERING and HFA will evaluate the grid and excavate additional suspect ordnance-like items, if any. Once the HFA and the ZAPATAENGINEERING UXO QC have determined an area has been sufficiently cleared of ordnance-like items, he will document the QC inspection in the QC logbook and QC form and notify ZAPATAENGINEERING's Project Manager. Once ZAPATAENGINEERING turns over daily QC logs and forms to the USAESCH, it is anticipated that the QA evaluation will occur at the time of turnover. If the grid fails QA inspection, ZAPATAENGINEERING and HFA will rework the grid as necessary at no additional cost to the government.

7.8 Corrective/Preventive Action Procedures

Guidelines have been established to assure conditions adverse to quality such as malfunctions, deficiencies, deviations and errors are promptly investigated, documented, evaluated and corrected. When a significant condition adverse to quality is noted in the field or at other subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. Condition identification, cause, reference documents and corrective action planned will be documented and reported to the Task Manager, UXO QC, Project Manager and involved subcontractor management. Implementation of corrective actions will be verified by documented follow-up action. All project personnel have the daily responsibility to promptly identify problem areas, solicit approved correction actions and report any condition adverse to quality. In general terms, corrective/preventive actions will be initiated at a minimum:

- When predetermined acceptance standards are not attained,
- When procedures or data compiled are determined to be faulty,
- When equipment or instrumentation is found faulty,
- When quality assurance requirements are violated,
- As a result of system and performance audits and/or
- As a result of management assessment.

Under contractual agreement, HFA will perform work in compliance with all workplans, guidance and regulatory specifications. As such, it is the responsibility of the ZAPATAENGINEERING UXO QC to ensure performance on-site, including the rework of areas that fail quality control checks until the area passes quality control checks, as described in Section 2.5.1 of this Addendum.

7.9 Data Management

All data generated during the contract will be stored in hard copy and electronic form by ZAPATAENGINEERING. Data deemed critically important will have multiple electronic versions archived. Following completion of each deliverable, data will be transformed to the USAESCH.

7.10 Field Operations

The ZAPATAENGINEERING Project Manager, UXO QC or Task Manager will witness all field operations firsthand.

7.11 Equipment Calibration/Maintenance Requirements

Equipment requiring calibration will be calibrated daily or as required by the operation manual to ensure accurate data collection. The instruments and general equipment will receive the proper maintenance and care to ensure quality performance.

7.11.1 Measurement equipment used on-site will be checked daily for operational reliability and calibration before use. Before intrusive activities, source materials will be used to verify equipment accuracy. Records of these equipment checks will be maintained in the QC activity log. If equipment field checks indicate equipment is not operating properly and field repairs cannot be made, the equipment will be tagged and removed from service. The Task Manager will be notified and a request for replacement equipment will be expedited. Replacement equipment will meet the same specifications for accuracy and sensitivity as the equipment removed from service.

7.12 Geophysical Instruments

Geophysical instruments will arrive on-site in a ready state and will be sufficiently tested on the test grid to ensure optimum settings are achieved. The geophysical sensors will be field checked daily on the test grid to ensure they are functioning as designed.

7.12.1 Site Communication Equipment

Site communication equipment will be checked daily for sufficient battery power. If equipment is damaged it will be replaced immediately.

7.12.2 Vehicles and Machinery

Vehicles and machinery will be used correctly per manufactures' warranty. All vehicles and machinery operation will be checked daily.

7.12.3 Air Monitoring Equipment

Air monitoring is not required.

7.12.4 Personal Protective Equipment (PPE)

The Unexploded Ordnance Safety Officer (UXO/SO) and Task Manager will be responsible for checking to make sure each employee has appropriate PPE. However, any employee may inform the UXO/SO or the Task Manager of PPE deficiencies.

7.12.5 Equipment

The quality of geophysical data sets is dependent on the operational capabilities of the equipment used. To ensure that equipment is fully capable and will perform in accordance with the manufacturers' specifications, ZAPATAENGINEERING will perform pre-operational and post-operational equipment checks. Following these checks, any equipment that is found unsuitable will be immediately removed from service. The UXO QC with input from the USAESCH OE Safety Officer will conduct an investigation to determine the impact of failure on completed work and the need to rework previously worked areas.

7.12.6 Pre-Operational Checks

Operators will follow the manufacturer's published procedures for placing operating equipment. In addition, the equipment will receive a functional check to ensure it is operating in accordance with published standards.

7.12.7 Hand-Held Electromagnetic Sensors (EM-61 HH)

The purpose of this test/calibration is to ensure that the instruments are operating properly and to appropriately adjust the sensitivity level of the instruments. A test plot will be established by burying a 60mm, 81mm and 105mm inert projectile (or similar test item) at various depths. The EM-61s will be checked against these sources to ensure they are operational and capable of detecting potential OE objects at the specified depth. This test will be performed before placing the instrument into operation. To ensure that instruments remain operational during field operation, they will be checked daily during field tests.

7.12.8 Post-Operational Checks

Daily, upon completion of field operations, all equipment will be inspected to ensure it is complete and serviceable and is shut down in accordance with the procedures identified by the manufacturer. Operators will report any damaged equipment, unusual wear or missing components. Batteries will be removed from battery-powered equipment and charged. Equipment, instruments, tools, gauges and other items requiring preventative maintenance will be serviced in accordance with the manufacturer recommendations.

7.12.9 Maintenance Procedures

The manufacturer's written maintenance schedule will be followed to minimize the downtime of the measurement system. It will be the operator's responsibility to adhere to this maintenance schedule and to arrange promptly any necessary service. At a minimum, equipment used daily will be cleaned at the end of each workday and kept in good operating condition. Service to the equipment, instruments, tools, etc. will be performed by qualified personnel.

7.12.10 Maintenance Records

Logs will be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools and gauges. Records produced will be reviewed, maintained and filed by the geophysical equipment operators and/or UXO technicians when this equipment is used at the site. The UXO QC will audit these records to verify complete adherence to these procedures.

7.13 Pass/Fail Criteria for all Quality Audits

Any nonconformance to the work or to contractual requirements will be documented.

Nonconformance includes, but is not limited to the following:

- If an item of OE/UXO or an item whose signature is similar is located in a grid during QA, this will constitute a failure of the Pass/Failure criteria and will require a re-sweep of the entire grid by the contractor at no additional cost to the government.
- Delivery of items or services that do not meet the contractual requirements of ZAPATAENGINEERING or any of its subcontractors.
- Errors made in following work instructions, or improper work instructions.
- Unforeseeable or unplanned circumstances, which result in items or services that do not meet quality, contractual, and/or technical requirements.
- Technical modifications to the project by individuals without the responsibility and authority.
- Errors in craftsmanship and trade skills.

7.14 Records Generated

All personnel will use bound field logbooks with consecutively numbered pages. Field logbooks will be maintained on-site for the duration of the fieldwork.

7.14.1 Daily Logs

- Date and recorder of field information
- Start and end time of work activities including breaks, lunch and down-time
- Visitors
- Weather conditions
- Relevant events
- Changes from approved or planned work instructions
- Signature of the ZAPATAENGINEERING Task Manager or UXO QC

7.14.2 Safety Log

- Date and recorder of field information
- Tailgate safety briefing (time conducted and by whom)
- Weather conditions
- Significant site events relating to safety
- Accidents
- Stop work because of a safety hazard or deficiency. Documentation will include the hazard or deficiency found, the action taken to correct it and the time lost (if any).

- Safety audits
- Signature of the ZAPATAENGINEERING Task Manager or UXO QC

7.14.3 Training Log

- Date and recorder of log
- Nature of training
- Visitor training
- Signature of both the ZAPATAENGINEERING Task Manager and the Subcontractor's SUXOS

7.14.4 QC Activity Log

- Date and recorder of log
- Equipment calibration/testing
- Equipment monitoring results
- QC audits
- Nonconformance reports
- Signature of both the ZAPATAENGINEERING UXO QC and the Subcontractor's SUXOS

7.14.5 Ordnance Accountability Log

- Date and recorder of log
- Assigned identification number
- Type, condition and location
- Disposition
- Signature of both the ZAPATAENGINEERING Task Manager and the Subcontractor's SUXOS

7.14.6 Inspection Forms

Inert ordnance items and non-hazardous scrap will be disposed of through a local civilian scrap yard. Appropriate documentation will be obtained from the scrap dealer. HFA will complete a DD Form 1348-1 as turn-in documentation. The Senior UXO Supervisor will sign the DD Form 1348-1 as follows:

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

7.14.7 Photographic Records

ZAPATAENGINEERING's Task Manager or the UXO QC will maintain photographic records or site work. Significant activities will be documented using a digital camera. Photographic records will be used to supplement information recorded in the daily activity logs, including photographs of equipment before use, typical ordnance items and the condition of sites before, during and after activity.

7.15 Daily Quality Control Reports

Daily QC Reports will be maintained during field activities and will document field measurements, calibration and maintenance of field instruments and management procedures. Corrective actions taken will be documented in the Daily QC Reports and the Project Manager will be notified immediately. The Daily QC Reports will be submitted to the USACE on a regular basis.

7.16 Weekly Progress Reports

Each week, ZAPATAENGINEERING's Project Manager will submit a progress report, per Data Item Description (DID) OE-085, to the USACE identifying accomplishments, noting deficiencies and describing corrective actions associated with the project. Information from the Daily QC Reports is summarized in the Weekly Progress Report. The weekly report will summarize ZAPATAENGINEERING's (including subcontractor) cost, schedule, progress, equipment, personnel and demolition information, as described in the DID.

7.17 Quality Control Summary Reports

After field activities are completed, Daily QC Reports and Monthly Progress Reports will be compiled and summarized in the QC Summary Report (QCSR). The QCSR will document all data validation. HFA will compile the QCSR report for this project. The report will include a discussion of any data points that may have been influenced or compromised, their impact on Data Quality Objectives or remedial decisions, problems encountered and any corrective actions implemented.

7.18 Conclusion

These QC procedures are designed to ensure the critical components of the process are inspected before, during and after operations are performed. Application of these procedures will ensure the work performed is of high quality and meets the objectives of this study. All QC records and documentation will be kept on-site and made available for government inspection. At task completion, QC records will be submitted to the USAESCH as supporting documentation for final report.

8.0 ENVIRONMENTAL PROTECTION PLAN

The nine-grid area of OOU6 largely has been cleared of vegetation for previous OE site activities. As no threatened or endangered species or cultural or archeological resources are suspected in the area, activities under this work effort require no additional documentation under the Environmental Protection Plan described in the original HFA Workplan.

8.1 Post-project Clean-up Activities

Once an area is cleared of the uppermost soil, silt fences and hay bales may be installed below the cleared area to stabilize the denuded slope. At the conclusion of ordnance removal operations, clean sifted soil will be transported back into the nine-grid area and stabilized. Perennial grass turf and pine saplings will be planted.

9.0 GEOGRAPHICAL INFORMATION SYSTEM (GIS)

All data collected will be provided to ZAPATAENGINEERING in electronic format or via daily logs. This will include survey data and the location of subsurface anomalies excavated by HFA. The data will be incorporated into the GIS and overlain on a base map for inclusion in the final removal report.

10.0 REFERENCES

- Code of Federal Regulations (CFR), *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*, 40 CFR 300.415, 7/93.
- Code of Federal Regulations (CFR), *Reporting Theft or Loss of Explosive Materials*, 27 CFR 55.30, April 1, 2000.
- Environmental Science and Engineering, Inc., *Engineering Evaluation/Cost Analysis, Former Camp Croft Army Training Facility, Spartanburg, South Carolina, 1996b*, for the US Army Engineering and Support Center, Huntsville, Alabama, January 1996.
- Human Factors Applications, Inc., *Final Removal Action Report, Ordnance Removal Action, Former Camp Croft, Spartanburg, SC*, for the US Army Engineering and Support Center, Huntsville, Alabama, 12 August 1997.
- Human Factors Applications, Inc., *Ordnance Removal Action, Former Camp Croft Workplan*, for the US Army Engineering and Support Center, Huntsville, Alabama, 10 May 1996.
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- National Institute of Occupational Safety and Health (NIOSH), *NIOSH Pocket Guide to Chemical Hazards*, June 1997.
- National Weather Service Climatic Data from Greenville-Spartanburg area at the web address of <http://www.nws.noaa.gov/er/gsp/climate/gspgen.txt>
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- US Army Engineering and Support Center (USAESC), Huntsville, Alabama Division, *Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions, HNC-ED-CS-S-98-7, 8/98*.

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US Department of the Army, *Explosive Ordnance Disposal Procedures*, TM 60A 1-1-31.

US Department of Defense, *Ammunition and Explosives Safety Standards*, DOD 6055.9-STD, 7/99.

US Department of Transportation, *Other Regulations Relating to Transportation*, 49 CFR 171-180 and 390-397, October 1, 2000.

US Environmental Protection Agency, 1993, *Guidance on Conducting Non-Time-Critical Removal Actions Under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*, Publication 9360.0-32, 8/93.

US Occupational Health and Safety Administration (OSHA), 1994, *Hazardous Waste Operations and Emergency Response Training Regulations*, 40 CFR 1910.120, 7/94.

UXB International, Inc., *Final Removal Report, Ordnance Removal Action, Former Camp Croft, OOU-3A, B and C; OOU-6; and OOU-11C and D, Spartanburg, South Carolina*, for the US Army Engineering and Support Center, Huntsville, Alabama, November 2000.

11.0 APPENDICES

11.1 Site Safety and Health Plan

ZAPATAENGINEERING SITE SAFETY AND HEALTH PLAN (SSHP) ADDENDUM

This SSHP is submitted as an addendum to the HFA Ordnance Removal Action, Former Camp Croft Work Plan, Appendix B, Site Safety and Health Plan, dated 10 May 96. Modifications were made to the SSHP based on available information concerning possible contaminants and physical hazards that exist, or may exist at the Former Camp Croft. The ZAPATAENGINEERING UXO QC/SO will serve as the Site Safety and Health Officer (Work Plan, Figure 2-2 Organizational Chart). The original HFA document was compared to current ZAPATAENGINEERING safety policies and federal and DoD safety regulations and modifications were made accordingly. Modifications were made under the direction of the ZAPATAENGINEERING Certified Industrial Hygienist and are notated by italics.

MODIFICATIONS

1.1.2 SITE/FACILITY LOCATION

1.1.2.1 Former Camp Croft consists of approximately 19,000 acres and is located 5 miles southeast of Spartanburg, South Carolina. Former Camp Croft is divided into four parts: Training Range Impact Area, Gas Chambers and Gas Obstacle Course Area, Cantonment Area, and Grenade Court. The OE removal action will be limited to the Training Range Impact Area, which is the present day Croft State Park. ~~The project site is further broken down into Ordnance Operable Units (OOU), OOU 1B, OOU 2, OOU 3, OOU 7, and Area 39. The sites that are to be cleared for ordnance, ammunition, and explosives contamination are shown on the site map. The OE removal action will be limited to Operable Unit OOU-6. The 26-acre area has been cleared of ordnance with the exception of 4.13 acres composed of nine contiguous grids. Each grid is 100 feet by 200 feet and is to be cleared for ordnance, ammunition, and explosives contamination.~~

~~1.1.2.2 OOU 1B is approximately 65 acres located in the center of the park and used for surface recreation (hiking and horseback riding). The Lake Johnson/Fairforest Creek Connector Trail and Croft State Park Road both pass through OOU 1B. The area is almost exclusively wooded terrain with a few horse or hiking trails.~~

1.1.2.2 The following types of OE has been identified in and around Operable Unit OOU-6: 60 mm mortars, 81 mm mortars, 105 mm smoke projectiles, 105 mm HE, mortar parts and numerous OE fragments.

~~1.1.2.3 OOU 2 is a 325-acre area located on the east side of the park, approximately 0.7 miles from State Highway 295. Activities performed in OOU 2 are generally limited to recreational surface use, which includes horseback riding and hiking. Henningston Road passes through OOU 2. The area is mostly wooded terrain.~~

~~1.1.2.4~~ OOU-3 is located on a private residential area north of the park. This area is approximately 11 acres in size and within the former Camp Croft cantonment area. Due to this area being a private residential property, intrusive activities (e.g., children digging, planting, pool construction, installation of utilities lines) may be possible.

~~1.1.2.5~~ OOU-7 is approximately 170 acres located in the vicinity of the park office and includes campgrounds, picnic areas, hiking trails, horse show ring, and is the busiest area of the park.

~~1.1.2.6~~ Area 39 was identified in the ASR as a potential OE area. The survey team for the ASR noticed this area had considerable OE contamination (i.e., Trench Mortars, fin assemblies, links for 20mm cartridges, and fuzes). Activities performed in this area generally consist of horseback riding.

1.1.4 PAST USES OF SITES OOU- 1B, OOU-2, OOU-3, OOU-7 AND AREA 39

~~1.1.4.1~~ OOU-1 is a suspected impact range for 60mm and 81mm mortars, and small arms training.

~~1.1.4.2~~ OOU-2 is a suspected impact range for 60mm, 81mm, and 4.2" mortars, and small arms training.

~~1.1.4.3~~ OOU-3 is a suspected practice range for MKII hand grenades.

~~1.1.4.4~~ OOU-7 is a suspected impact range for 60mm and 81mm mortars, small arms training, and hand grenade practices.

1.1.4.1 OOU-6 is a suspected impact range for 60 mm mortars, 81 mm mortars, 105 mm and smoke projectiles.

1.3 FRAGMENTATION DISTANCE/MCE

~~1.3.1 OOU-1B~~ The fragmentation distance for OOU-1B is based on a 81mm HE mortar. The fragmentation distance is 800 feet (60A-1-1-4) and pertains to the whole site.

~~1.3.2 OOU-2~~ The fragmentation distance for OOU-2 is based on a 4.2" HE mortar. The fragmentation distance is 955 feet (60A-1-1-4) and pertains to the whole site.

~~1.3.3 OOU-3~~ The fragmentation distance for OOU-3 is based on a MKII HE hand grenade. The fragmentation distance is 150 feet (ETL 385-1-1), the safe separation between UXO teams, and pertains to the whole site.

1.3.1 The fragmentation distance for OOU-6 is 270 feet. This is based on the 105 mm HE obtained from the USACE Safety Submission Supplement and DoD 6055.9 Std, July 99, Table C9.T2

1.3.4 Protection of personnel and property are critical elements of any removal operations performed at this site. Engineering controls will be employed during any intrusive activities and/or demolition operations to protect nearby structures and evacuation of residents will be the primary method of protecting people. The location of underground utilities will be determined before excavations or in place detonation occurs via contact the local utilities ("Miss Utility" @ 800-922-0983) in locating the buried utilities.

1.3.4.1 The aluminum shelters used at other HFA sites will satisfy the requirement for engineering controls during intrusive activities and tamping of the UXO that are to be detonated in place will be done with sand/earth cover for protection of property.

1.3.4.2 Due to the sensitive fuzes used in hand grenades, moving them is not a safe option. If a situation arises where a UXO cannot be detonated in place, the CEHNC Safety Representative will be notified so he can contact the nearest EOD unit for support.

~~1.3.5 OOU 7 The fragmentation distance for OOU 7 is based on a 81mm HE mortar. The fragmentation distance is 705 feet (60A-1-1-4) and pertains to the whole site.~~

~~1.3.6 Area 39 The fragmentation distance for Area 39 is based on a 60mm HE mortar. The fragmentation distance is 560 feet (60A-1-1-4) and pertains to the whole site.~~

1.3.7 All non-UXO personnel will be evacuated to an area outside of the established fragmentation distance zones. This fragmentation distance only applies during intrusive activities.

2.4 SCOPE OF WORK

~~2.4.1 HFA will perform an ordnance, ammunition, and explosive removal action of OOU 1B, OOU 3, OOU 7, and Area 39 located on Former Camp Croft. The purpose of this removal action is to safely perform a surface and subsurface clearance of the identified project sites. This will include the following tasks:~~

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

2.4.1 Ordnance Operable Unit 6 (OOU6) is approximately 28 acres and has previously been cleared of ordnance with the exception of 4.13 acres composed of nine contiguous grids. Each grid is 100 ft by 200 ft and contains considerable metal fragments within the eight to twelve inches of the ground surface. The nine grids are located in eastern part of OOU6.

The USAESCH, through an agreement with the US Air Force Research and Development Center (USAFRDC), Tyndall Air Force Base (AFB), Florida, will use a remotely controlled bulldozer (D-8) and a remotely controlled excavator at this site. USAFRDC employees will operate both pieces of equipment

from a control vehicle parked outside the exclusion zone. The bulldozer will skim the surface of the site, removing soil to a design depth of approximately eight to 12 inches.

The spoil material will be stockpiled. Material will be removed from the spoil pile using the USAFRDC's remotely operated excavator with a one-third cubic yard bucket. The material will be sifted using a USAFRDC-furnished and remotely operated "Nordberg Screen-All CV-90 D". The sifter will be checked routinely using a remotely operated camera on the extension of the excavator and, if needed, stopped to check for OE items by a qualified UXO technician. Sifted soil will be considered free of OE and stockpiled outside the nine-grid boundary using the remotely operated excavator. This clean material will continue to be stockpiled until the nine-grid site has been manually cleared of subsurface ordnance. Erosion control measures will be employed to control runoff from the stockpile. At the conclusion of the removal effort, the stockpiled clean soil will be transported back into the nine-grid area and the slope stabilized and seeded. During the non-bulldozing and non-sifting workdays (three days per week), HFA will conduct "mag and flag" ordnance removal operations within the areas where surface material and metallic clutter have been reduced. HFA will use the audible signal from the hand-held electromagnetic sensor (EM-61) to located subsurface anomalies to a depth of four feet from original ground surface.

2.5.6 QUALITY CONTROL, add ZAPATAENGINEERING

2.6.5 LIGHTNING

2.6.5.1 Electrical storms commonly occur in the Former Camp Croft 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. ZAPATAENGINEERING will have a battery powered emergency weather radio on-site, which will be operational during all field activities for notification of emergency weather conditions.

Table 2-1, Potential Contaminants, replace with the following as applicable.

Table 2-1, Potential Contaminants

CONTAMINANT	EXPOSURE LIMIT ¹ (PEL OR TLV)
EXPLOSIVES	
Cyclomethylene trinitramine	0.5 mg/m ³ , skin (ACGIH ³)
1, 3 Dinitrobenzene	0.15, skin (ACGIH ³)
Trinitroluene (TNT)	0.1 mg/m ³ , skin (ACGIH)
SCREENING SMOKE	
White phosphorus	0.02 (ACGIH)

Table 2-3, Threshold Limit Values for Noise, *replace with following table.*

Table 2-3 Threshold Limit Values for Noise

NOISE DURATION PER DAY, HOURS	SOUND LEVEL dBA SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
1/4 or less	115

3.1.11 OCCUPATIONAL PHYSICIAN

3.1.11.1 Conmed, Inc., (Dr. H.M. Haft) provides direction and oversight for HFA, Inc.'s medical surveillance program. Dr. Haft 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. *The Occupational Physician for ZAPATAENGINEERING is Dr. John Beard MD. Dr. Beard is eligible for certification in occupational medicine by the American Board of Preventive Medicine and is responsible for medical surveillance protocols and for review of all physical examinations and test results. Dr. Beard offices are located at 1915 Randolph Road, Charlotte, North Carolina 28204, telephone (704) 330-1700.*

4.1 Training & Initial Indoctrination, *add ZAPATAENGINEERING throughout*

Table 4-1, Training Dates, delete

4.3.4 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

4.3.4.1 ~~———— All site personnel will receive training outlined in HFA's Personnel Protective Equipment Program. A copy of the PPE Program will be maintained on site. Site Specific training will be given on Self-Contained Breathing Apparatus (SCBA) and Level A (Trellborg High Performance Suits) if required. Level D PPE will be required for site activities.~~

4.3.5 CHEMICAL WARFARE MATERIAL (CWM) TRAINING

~~4.3.5.1 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. CWM is not anticipated to be encountered during site activities.~~

~~6.2 Documentation of medical examinations is maintained at the HFA, Inc., Waldorf, Maryland office. The documentation shall be complete, accurate and be kept on file for 30 years after termination of employment. A minimum of the following information shall 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. Documentation of medical examination for HFA personnel are maintained at the HFA, Inc., Waldorf, Maryland office. ZAPATAENGINEERING documentation of medical examination for personnel is maintained OccMed in Charlotte, North Carolina. Copies of the Physician's Statement will be maintained at the ZAPATAENGINEERING's site office for all personnel.~~

Table 6-1, Medical Surveillance Program, delete.

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. The UXO QC/SO will use a real-time direct reading WBGT monitor in addition to estimating work demand (Tables 8-1, 8-2) and determining clothing ensemble (Table 8-3) to select the work rest schedule. If conditions and/or work loads warrant, the UXO QC/SO may also implement monitoring as outlined in paragraph 8.2.~~

Table 8-1, Permissible WBGT Heat Exposure Threshold Limit Values, *delete and insert the following tables.*

Table 8-1, Permissible WBGT Heat Exposure Threshold Limit Values (Acclimatized) WBGT values in °F

Acclimatized ²				
WORK DEMANDS ³	LIGHT	MODERATE	HEAVY	VERY HEAVY
100% Work	85	82	79	
75% Work, 25% Rest	87	83	82	
50% Work, 50% Rest	89	85	83	82
25% Work, 75% Rest	91	88	86	85

Table 8-2, Permissible WBGT Heat Exposure Threshold Limit Values (Unacclimatized) (WBGT values in °F)

Unacclimatized				
Work Demands	Light	Moderate	Heavy	Very Heavy
100% Work	82	77	73	
75% Work, 25% Rest	84	78	76	
50% Work, 50% Rest	86	82	80	77
25% Work, 75% Rest	88	84	82	80

¹American Conference of Governmental Industrial Hygienist, 2001

²Requires 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work.

³Examples of Work Demand categories include:

Work Demand	Example Activities
Light	Standing with light or moderate work at machine or bench and some walking about
Moderate	Walking about with moderate lifting or pushing
Heavy	Intermittent heavy lifting with pushing or pulling (pick-and-shovel work)
Very Heavy	Shoveling wet sand

Table 8-3, Clothing Ensemble

CLOTHING TYPE	WBGT ADDITIONS
Summer work uniform ¹	0
Cloth (woven material) overalls	+3.5
Double-cloth overalls	+5

Note: These values must not be used for encapsulating suits or garments that are impermeable or highly resistant to water vapor or air movement through fabrics

¹Cotton long-sleeved shirt and pants

8.2 Body 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.~~

The UXO QC/SO will also monitor workers for excessive heat stress by one or more of the following measures, and an individual's exposure to heat stress will be discontinued when any of the following occur:

- *Sustained (several minutes) heart rate is in excess of 180 beats per minute (bpm) minus the individual's age in years (180-age), for individuals with assessed normal cardiac performance; or*
- *Body core temperature is greater than 101.3°F for medically selected and acclimatized personnel, or greater than 100.4°F in unselected, unacclimatized workers; or*
- *Recovery heart rate at one minute after a peak work effort is greater than 110 bpm; or*
- *There are symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness.*

An individual may be at greater risk if

- *Profuse sweating is sustained over hours; or*
- *Weight loss over a shift is greater than 1.5% of body weight; or*
- *24-hour urinary sodium excretion is less than 50 mmoles.*

If a worker appears to be disoriented or confused, or suffers inexplicable irritability, malaise, or flu-like symptoms, the worker should be removed for rest in a cool location with rapidly circulating air and emergency care contacted for assistance.

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 (Wending) from the daily starting weight to obtain the weight lost (Wlost) for a given work period: (Wstart) —~~

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

~~8.3.1.3 Compare (W_{lost}) to the (W_{perm}) , if (W_{lost}) is less than or equal to 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.~~

11.1 Sanitary Facilities, *add ZAPATAENGINEERING.*

14 Emergency Response and Contingency Procedures, *add ZAPATAENGINEERING throughout.*

Table 14-1 Emergency Contacts, *delete and insert following*

Table 14-1 Emergency Contacts

EMERGENCY CONTACT	TELEPHONE NUMBER
Highway Patrol (State Police)	864-587-4700
Spartanburg Fire Department	864-596-2150/2084/2085/1616
Spartanburg Regional Hospital	864-560-6000 Emergency 864-560-6222
Spartanburg Police	864-596-2222
Sheriff Department, Bomb Disposal	864-596-2616/2615
Croft State Park, Jerry Perry	864-585-1283
748 th Ordnance Company, Ft Jackson, SC 1Sgt Leitha	803-751-5126
TEU APG, MD	410-436-2773
USAECH Project Manager, Karl Blankinship, PE	256-895-1548
ZAPATAENGINEERING Project Manager, Ed Henson, AIA	704-507-8527
ZAPATAENGINEERING Task Manager, Jason Shiflet, PG	704-507-8529
ZAPATAENGINEERING SUXOS, Chris Rose, TJ Die	704-507-8531
ZAPATAENGINEERING Health and Safety Manager, John Soyak, CIH	410-838-2731
ZAPATAENGINEERING Field Office (Spartanburg)	704-507-8525

14.5 FIRE PROTECTION AND EMERGENCY SERVICE

~~14.5.1 Fire protection and emergency services can be obtained from the Forestry Fire Department @ (803) 582-3533 and emergency medical services by dialing (803) 560-6000 or dialing 911. Fire protection and emergency services can be obtained from the Spartanburg Fire Department at 864-596-2150 or 911.~~

14.6 FIRST AID NOTIFICATION PROCEDURES

~~14.6.4 Request for transportation of injured personnel via Emergency Medical Services (EMS) will be coordinated with the Ambulance Service at (803) 560-6000. EMS personnel will~~

~~take the injured person(s) to the hospital and start the immediate treatment required. Request for transportation of injured personnel via Spartanburg Regional Hospital will be coordinated with Emergency at 864-560-6222.~~

Activity Hazard Analysis Sheets, *delete and insert following.*

ACTIVITY HAZARD ANALYSIS

ACTIVITY: MOBILIZATION

ANALYZED BY/DATE: YOLANDA A. HUBBARD, MAR, 2001

REVIEWED BY/DATE: JOHN A. SOYAK, MSPH, CIH, MARCH 14, 2001

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	
Placement of office trailer Installation of additional fencing at off-site location Conduct Health and Safety Activities.	Back Strain or Sprain Uneven Surfaces/Poor Housekeeping Foot Injuries Cuts and Lacerations with use of Hand Tools and Equipment Poisonous Plants & Animals	Proper lifting techniques, move heavy objects with mechanical equipment or assistance if over 50 pounds. Good housekeeping Wearing of ANSI-approved safety shoes or boots with steel toe. Work gloves and hard hats. Avoidance.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS		TRAINING REQUIREMENTS
Hand tools Support Vehicles	Inspect all hand tools prior to use and repair or replace damaged tools. Daily inspection of Fire Extinguishers and First Aid Kits. Daily work area health and safety inspections by ZAPATAENGINEERING UXO QC/SO.		Basic First Aid and CPR Initial Safety Briefing Daily Safety Meetings Emergency Response Plan Accident Prevention Plan Heat Stress Awareness

ACTIVITY: ORDNANCE REMOVAL-US AIR FORCE
 REVIEWED BY/DATE: JOHN A. SOYAK, MSPH, CIH, MARCH 14, 2001

ANALYZED BY/DATE: YOLANDA A. HUBBARD, MAR, 2001

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	
Removal of OE and sifting soils by remotely operated equipment. Identify OE/UXO Conduct Health and Safety Activities.	Remotely operated equipment Potential UXOs Uneven Surfaces/Poor Housekeeping Foot Injuries Cuts and Lacerations with use of Hand Tools and Equipment Noise Heat Stress Back Strain or Sprain Poisonous Plants & Animals	Operation of remote equipment by US Air Force authorized personnel. Post warning signs, establish exclusion/MCE zones, and stop all unauthorized personnel from entering the site. Follow WP, SSHP, and other standard practices. Stay alert. Apply CEHNC Safety Concepts and basic considerations for UXO operations. Good housekeeping Wearing of ANSI-approved safety shoes or boots with steel toe. Work gloves and hard hats. Wearing ear plugs/muffs for noise levels greater than 85 dBA. Rest/work cycles, fluids, layered clothing, temperature monitoring. Proper lifting techniques, move heavy objects with mechanical devices or assistance if over 50 pounds. Avoidance.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS		TRAINING REQUIREMENTS
Hand tools Remote Bulldozer Remote Sifter Support Vehicles	Inspect all hand tools prior to use and repair or replace damaged tools. Inspect heavy equipment prior to use. Daily inspection of Fire Extinguishers and First Aid Kits. Daily work area health and safety inspections by ZAPATAENGINEERING UXO QC/SO.		Basic First Aid and CPR Initial Safety Briefing Daily Safety Meetings Emergency Response Plan Accident Prevention Plan Heat Stress Awareness

ACTIVITY: ORDNANCE REMOVAL-ZAPATAENGINEERING

ANALYZED BY/DATE: YOLANDA A. HUBBARD, MAR, 2001

REVIEWED BY/DATE: JOHN A. SOYAK, MSPH, CIH, MARCH 14, 2001

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	
Identify OE/UXO Excavating anomalies Conduct Health and Safety Activities.	Potential UXO Uneven Surfaces/Poor Housekeeping Foot Injuries Cuts and Lacerations with use of Hand Tools and Equipment Noise Poisonous Plants & Animals	Post warning signs, establish exclusion/MCE zones, and stop all unauthorized personnel from entering the site. Follow WP, SSHP, and other standard practices. Stay alert. Apply CEHNC Safety Concepts and basic considerations for UXO operations. Good housekeeping Wearing of ANSI-approved safety shoes or boots with steel toe. Work gloves and hard hats. Wearing ear plugs/muffs for levels greater than 85 dBA. Avoidance.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS		TRAINING REQUIREMENTS
Hand tools Schonstedt Support Vehicles	Inspect all hand tools prior to use and repair or replace damaged tools. Daily inspection of Fire Extinguishers and First Aid Kits. Daily work area health and safety inspections by ZAPATAENGINEERING UXO QC/SO.		Basic First Aid and CPR Initial Safety Briefing Daily Safety Meetings Emergency Response Plan Accident Prevention Plan Heat Stress Awareness US Navy EOD Graduate

ACTIVITY: DETONATION

ANALYZED BY/DATE: YOLANDA A. HUBBARD, MAR, 2001

REVIEWED BY/DATE: JOHN A. SOYAK, MSPH, CIH, MARCH 14, 2001

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	
Detonating UXO	Potential UXO Flying Debris Uneven Surfaces/Poor Housekeeping Foot Injuries Cuts and Lacerations with use of Hand Tools and Equipment Noise Poisonous Plants & Animals	Post warning signs, establish exclusion/MCE zones, and stop all unauthorized personnel from entering the site. Follow WP, SSHP, and other standard practices. Stay alert. Apply CEHNC Safety Concepts and basic considerations for UXO operations. Maintaining fragmentation distance from the detonation site. Good housekeeping Wearing of ANSI-approved safety shoes or boots with steel toe. Steel-toe safety boots, work gloves, and hard hats. Wearing ear plugs/muffs for noise levels greater than 85 dBA and during detonations. Avoidance.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS		TRAINING REQUIREMENTS
Demolition materials and equipment Explosives	Daily inspection of Fire Extinguishers and First Aid Kits. Daily work area health and safety inspections by ZAPATAENGINEERING UXO QC/SO.		Basic First Aid and CPR Initial Safety Briefing Daily Safety Meetings Emergency Response Plan Accident Prevention Plan Heat Stress Awareness US Navy EOD Graduate

ACTIVITY HAZARD ANALYSIS

ACTIVITY: DEMOBILIZATION

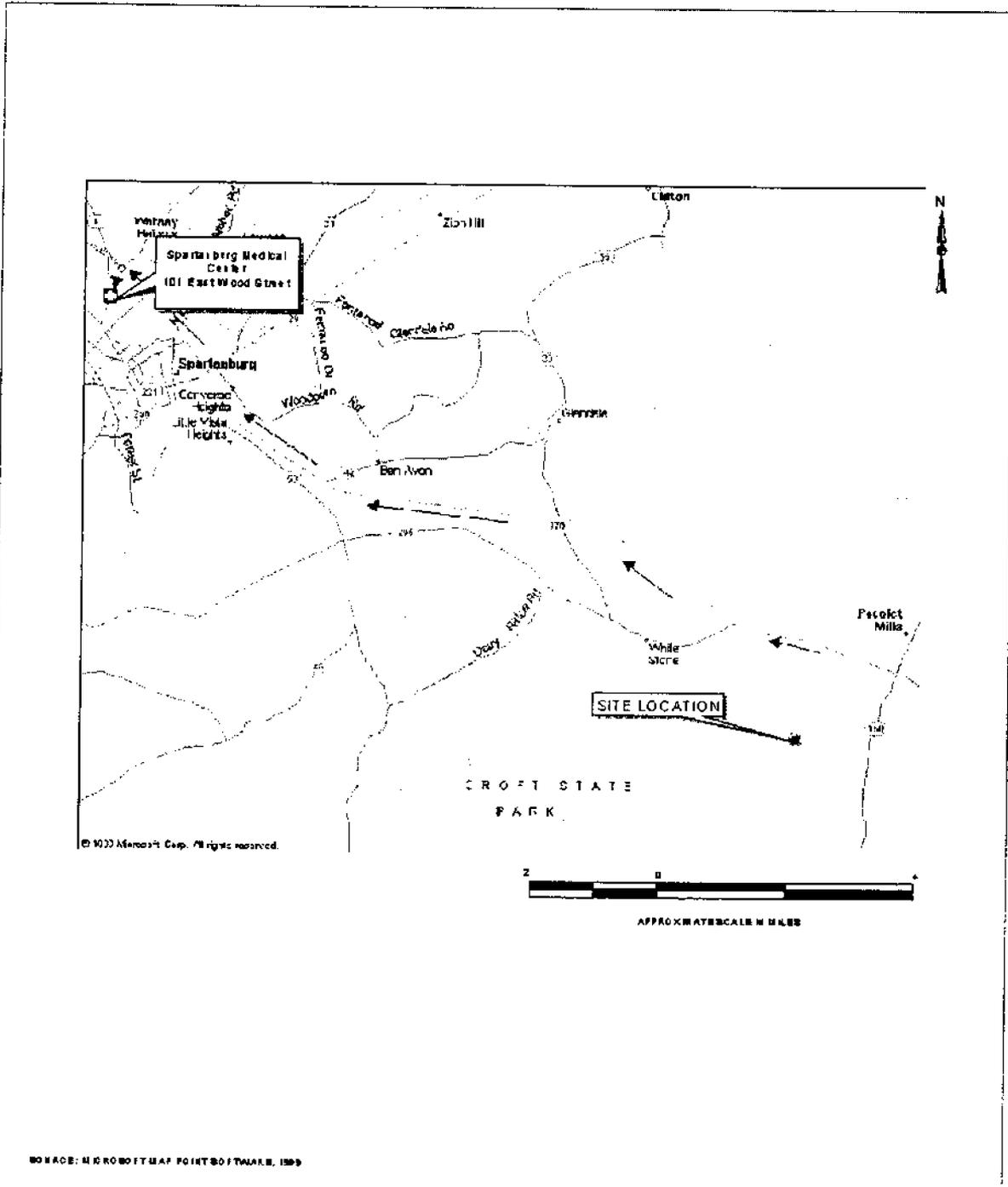
ANALYZED BY/DATE: YOLANDA A. HUBBARD, MAR, 2001

REVIEWED BY/DATE: JOHN A. SOYAK, MSPH, CIH, MARCH 14, 2001

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS	
Remove office trailer Remove scrap metal Removal remote bulldozer and soil sifter	Back Strain or Sprain Uneven Surfaces/Poor Housekeeping Foot Injuries Cuts and Lacerations with use of Hand Tools and Equipment Poisonous Plants & Animals	Proper lifting techniques, move heavy objects with mechanical devices or with assistance if over 50 pounds. Good housekeeping Wearing of ANSI-approved safety shoes or boots with steel toe. Work gloves and hard hats. Avoidance.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS		TRAINING REQUIREMENTS
Hand tools Support Vehicles	Inspect all hand tools prior to use and repair or replace damaged tools. Daily inspection of Fire Extinguishers and First Aid Kits. Daily work area health and safety inspections by ZAPATAENGINEERING UXO QC/SO.		Basic First Aid and CPR Initial Safety Briefing Daily Safety Meetings Emergency Response Plan Accident Prevention Plan

DIRECTIONS TO SPARTANBURG MEDICAL CENTER FROM CAMP CROFT

1. Take Highway 150 NE to Highway 176.
2. Travel NW on Highway 176 to I-585/US 221 exit.
3. Go SW on I-585/US 221 to North Church Street.
4. Travel south and SPARTANBURG MEDICAL CENTER will be located at 101 East Wood Street.



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SOURCE: MICROSOFT MAP POINT SOFTWARE, 1999

ZAPATA ENGINEERING P.A. <small>— 2700 W. STATE ST. SUITE 200 HUNTSVILLE, AL 35894 TEL: 256-833-1111 FAX: 256-833-1112 WWW.ZAPATAENGINEERING.COM</small>	 U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE, ALABAMA	PROJECT TITLE: FORMER CAMP CROFT DRAWING TITLE: HOSPITAL ROUTE MAP			
		PROJECT #: ZE016100	DATE: 03/11/2001	DRAWN BY: D.WOLF	SCALE: AS SHOWN

IRUFI • INTEGRITY • QUALITY

**SITE SAFETY AND HEALTH PLAN
ADDENDUM**

FORMER CAMP CROFT

SPARTANBURG, SOUTH CAROLINA

For:

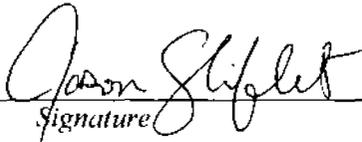
US Army Corps of Engineers, Savannah District
100 W. Oglethrope Avenue
Savannah, GA 31401-3640

By:

ZAPATAENGINEERING, P.A.
1100 Kenilworth Avenue
Charlotte, North Carolina 28204
Phone (704) 358-8240

Jason Shiftlet, PG
Task Order Manager
ZAPATAENGINEERING, P.A.

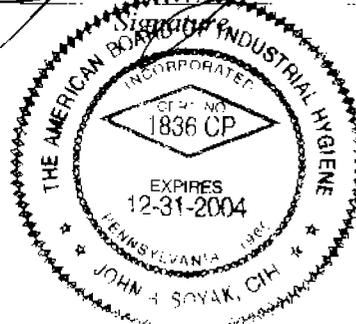
John A. Soyak, MSPH, CIH
Safety and Health Manager
ZAPATAENGINEERING, P.A.



05/21/01
Date



3/21/01
Date



11.2 Task Order Scope of Work

MODIFICATION 1 TO ZAPATA TASK ORDER AT CAMP CROFT *REVISED February 23, 2001*

- 3.3.1 Ordnance Operable Unit 6: This area has been previously cleared of ordnance by HFA under contract DACA-87-D-0027 with the exception of 9 grids. Each grid is 100 ft x 200 ft and contains considerable metal fragments within one foot of the ground surface. Government furnished remote controlled equipment and operator training/ assistance will be used. The purpose for the use of this equipment is to allow removal of the top 8 – 12 inches of soil which contains most of the metallic debris. All ordnance related operations (within the exclusion zone) shall be performed by the contractor. The specific requirement of this task is to remove all ordnance to a depth of four feet within the 9 grid area.
- 3.3.1.1 Detailed work plans (WP), ~~explosive safety submission (ESS)~~, and Final Removal Report (FRR) updates are required. The approved Final documents from the previous contract shall be amended to include the remote equipment and the results of this removal. Distribution of Draft and final submittals shall be per Table 1 of this task order. The draft WP and ESS shall be submitted 15 calendar days after award and the final no more than 10 days after receipt of comments. The FRR is due 20 days after field work completion. ~~This shall be a fixed price item.~~
- 3.3.1.2 A detailed description of all work accomplished shall be provided in report and presentation format. Both report and presentations shall include photographs and video and or video clips of the robotic operations.

11.3 Local Points of Contact

Name	Company	Office Number	Mobile Number
Karl Blankinship	USAESCH	1-256-895-1548	
Bob Bohannon	USAESCH	1-256-895-1793	1-256-426-3411
Walt Waltz	US Air Force Research Lab	1-850-283-3725	1-850-774-0143
Shane Gilmore	US Air Force Research Lab	1-850-283-3725	1-850-774-0490
Marvin Gay	US Air Force Research Lab	1-850-283-3725	1-850-774-0490
Rick Hanoski	HFA, Inc.	1-301-705-5044	1-301-643-1277
Bob Raesemann	HFA, Inc.	1-301-705-5044	
William Harris	HFA, Inc.	1-301-705-5044	
Mark Lewis	HFA, Inc.	1-301-705-5044	
Ed Henson	ZAPATAENGINEERING	1-704-358-8240	1-704-507-8527
TJ Die	ZAPATAENGINEERING	1-704-358-8240	1-704-507-8531
Chris Rose	ZAPATAENGINEERING	1-704-358-8240	1-704-507-8531
Jason Shiflet	ZAPATAENGINEERING	1-704-358-8240	1-704-507-8529
Rick Renna	Spartanburg County Bomb Squad	1-864-596-2616	1-864-577-7061
Richard Gordon	Security Services America	1-864-585-7858	1-864-415-4804
Non-emergency	South Carolina Highway Patrol	1-864-587-4700	
Non-emergency	Spartanburg Regional Hospital	1-864-560-6000	
Jerry Perry	Croft State Park	1-864-585-1283	

11.4 ZAPATAENGINEERING Forms

11.4.1 Site Safety and Health Briefing Log

ZAPATAENGINEERING, P.A.
 Site Safety and Health Briefing Log

Date: ____/____/____		Location: _____	
Time: _____ AM PM		Prime: _____	
Weather: _____		Subcontractors: _____	
Subcontractors: _____		Subcontractors: _____	
1. Briefing Type:			
<input type="checkbox"/>	Initial Safety Briefing	<input type="checkbox"/>	New Site Procedure
<input type="checkbox"/>	Daily Safety Briefing	<input type="checkbox"/>	New Site Information
<input type="checkbox"/>	New Task Briefing	<input type="checkbox"/>	Review of Site Information
<input type="checkbox"/>	Periodic Safety Meeting	<input type="checkbox"/>	Other: (Specify)
2. Personnel Attending:			
The contents of the Work Plan have been explained to me and I have had the opportunity to review the Work Plan concerning the ordnance and/or environmental investigations at the site location noted above. I understand the information and hazards presented and I agree to comply with the stated policies and procedures set forth in said Work Plan. I recognize that these are minimum levels of protection based on current knowledge of the hazards present at the site location noted above.			
Name		Signature	Company
3. Topics: (Check all that apply)			
<input type="checkbox"/>	Site Safety Personnel	<input type="checkbox"/>	Decontamination Procedures
<input type="checkbox"/>	Site/Work Area Description	<input type="checkbox"/>	Emergency Response/Equipment
<input type="checkbox"/>	Physical Hazards	<input type="checkbox"/>	On-site Injuries/Illnesses
<input type="checkbox"/>	Chemical/Biological Hazards	<input type="checkbox"/>	Reporting Procedures
<input type="checkbox"/>	Heat/Cold Stress	<input type="checkbox"/>	Directions to Medical Facilities
<input type="checkbox"/>	Work/Support Zones	<input type="checkbox"/>	Drug, Alcohol and Smoking Policies
<input type="checkbox"/>	Personal Protective Equipment	<input type="checkbox"/>	Medical Monitoring
<input type="checkbox"/>	Safe Work Practices	<input type="checkbox"/>	Evacuation/Egress Procedures
<input type="checkbox"/>	Air Monitoring	<input type="checkbox"/>	Communications
<input type="checkbox"/>	Task Training	<input type="checkbox"/>	Confined Spaces
<input type="checkbox"/>	OE Precautions	<input type="checkbox"/>	Site Do's and Don'ts
<input type="checkbox"/>	Points of Contact	<input type="checkbox"/>	Other: (Specify)
4. Remarks/Comments:			
5. Briefing Conducted by:			
Name		Signature	Company

11.4.3 Daily Quality Control Inspection Report

PROJECT:

CONTRACT:

DATE:

WEATHER:

UXO QC:

(1)

(2)

(3)

TASK INSPECTED

RESULT

COMMENT

QC INSPECTED GRIDS

RESULT

COMMENT

QC INSPECTED GRIDS

RESULT

COMMENT

-
- 1 - From Q Inspection Schedule
 - 2 - C = Conforms, N = Nonconformance
 - 3 - Describe nonconformance
-

ZAPATAENGINEERING, P.A.

11.5 Property List

Item	Description	Rate	Unit	Quantity	Extended Costs
1	Office Trailer - 12'x60', 2 offices with built-in desks	\$359.00	Month	4	\$1,436.00
2	Office Trailer - Delivery/Pickup and Setup/Knockdown	\$408.00	Each	2	\$816.00
3	Office Trailer - Steps (Aluminum)	\$45.00	Month	4	\$180.00
4	Office Trailer - Anchors/Tiedowns	\$320.00	Each	1	\$320.00
5	Portable Toilet	\$70.00	Month	4	\$280.00
6	Portable Toilet - Delivery/Pickup	\$0.00	Each	1	\$0.00
7	Electrical Service	\$125.00	Month	4	\$500.00
8	Electrical Service - Hook-up Fee	\$200.00	Each	1	\$200.00
9	Telephone Service	\$200.00	Month	4	\$800.00
10	Telephone Service - Installation Fee	\$65.00	Each	1	\$65.00
11	Internet Service	\$45.00	Month	4	\$180.00
12	Digital Camera	\$600.00	Each	1	\$600.00
13	Bush-hog Tractor	\$495.00	Month		\$0.00
14	Laptop Computer	\$295.00	Month	4	\$1,180.00
15	Printer/Scanner/Fax Machine	\$75.00	Month	4	\$300.00
16	Computer setup, delivery and pickup fee	\$50.00	Each	1	\$50.00
17	Cell phone with two-way radio capability (equip + svc)	\$360.00	Each	4	\$1,440.00
18	Work Gloves	\$3.30	Each	5	\$16.50
19	PVC Pin Flags - Red, Yellow & White (bundle of 50.)	\$4.30	Each	36	\$154.80
20	Ear Protection	\$24.50	Each	1	\$24.50
21	Eye Protection	\$5.95	Each	5	\$29.75
22	Eyewash Kit and Additive	\$6.55	Each	3	\$19.65
23	Igloo Drinking Cooler Kit	\$84.40	Each	2	\$168.80
24	Fire Extinguisher	\$99.50	Each	2	\$199.00
25	Air Horn	\$15.00	Each	2	\$30.00
26	Key Locks	\$7.49	Each	5	\$37.45
27	Fiberglass Measuring Tapes - 300 ft	\$81.50	Each	3	\$244.50
28	Field book	\$16.50	Each	12	\$198.00
29	Space Pens	\$6.95	Each	5	\$34.75
30	Fluorescent Spray Paint	\$3.95	Each	20	\$79.00
31	Caution Tape	\$9.95	Each	10	\$99.50
32	Survey Flagging Tape	\$1.60	Each	10	\$16.00
33	Silt Fencing	\$0.92	Linear ft	3600	\$3,312.00
34	Shovels	\$22.95	Each	2	\$45.90
35	Hand Trowels	\$4.98	Each	2	\$9.96
36	Geo-Grid - 30,556 yd2	\$1.65	Yd2	30556	\$50,417.40
37	Hay Bails	\$3.00	Each	100	\$300.00
38	Equipment Shipping	\$500.00	LS	1	\$500.00
39				SUM:	\$64,284.46

11.6 Resumes

SUZY CANTOR-MCKINNEY
ORDNANCE PROGRAM MANAGER

SUMMARY OF CAPABILITIES

- Unexploded Ordnance (UXO) Program Management
- Subcontract Management
- Engineering Evaluation/Cost Analysis (EE/CA)
- Footprint Reduction
- CERCLA Time and Non-Time Critical Removal Actions
- Geophysical Data Collection and Analysis
- Technical Report Preparation and Review

EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

M.S., Land and Water Resource Management, University of North Texas, 1983
B.S., Biology, Marshall University, 1982
40-Hour OSHA Health and Safety Training 29 CFR 1910.120
8-Hour Supervisor Course 29 CFR 1910.120 (e) (4)

PROFESSIONAL EXPERIENCE

As a Program Manager, she manages and directs multiple, simultaneous field investigations, subcontractor activities, and in-house engineering teams at OE sites throughout CONUS. In this capacity, she is also involved with the development and implementation of community relations programs to support work efforts at such sites.

EE/CA for Eastern Bypass, Fort McClellan, AL. USAESCH. Managed all fieldwork and analyses required for the EE/CA. Effectively managed multiple subcontractors in the field performing simultaneous and concurrent tasks. Presented acceptable risk reduction alternatives based on regulator concerns. Approved risk reduction alternative(s) will be implemented during roadway construction activities to protect construction personnel from encounters with OE.

Intrusive Site Investigation & EE/CA at CWM and Conventional OE Sites, Laurinburg, NC. USAESCH. Responsible for geophysical and intrusive site activities at the former Army air base in North Carolina, suspected to contain a buried chemical warfare agent. Managed multiple subcontractors for the site investigation and ensures close coordination with the PM Non-Stockpile, TEU, and ECBC. In addition to the chemical agent-related activities, managed the reacquisition and sampling of the conventional ordnance area at this site. Field effort was completed ahead of schedule and under budget.

Ordnance Characterization and Prioritization. The Former Camp Beale, CA. USAESCH. Managed OE evaluation effort of 60,000 acres including extensive records reviews; community

and stakeholder interviews; and a site survey to compare historical data with land use patterns and population trends to identify and prioritize sites for additional actions. Directed in-house development of GIS applications to manage historical and current land use data for use and evaluation in during EE/CA activities.

OE Recurring Review, Former Camp Elliott – Mission Trails, San Diego, CA. USAESCH. Manages project team in preparation of the Recurring Review monitoring report for FUDS. Project tasks include participation in the site investigation, conduct of stakeholder interviews, development of informational materials, development and maintenance of a project website, and preparation of technical reports. Coordinates with the USAESCH, USACE Los Angeles, and local community officials.

Blast Chamber Test for Destruction of CWM & Shape Charge Evaluation of High-Explosive Ordnance. USAESCH. Manages the planning and execution of testing to prove the concept for the safe and efficient destruction of CWM ordnance and separate tests to determine the effectiveness varying configurations of commercially available shape charges for detonation of conventional high explosive ordnance. Oversees the performance of ZAPATAENGINEERING'S engineering team as well as two subcontractors in the planning and execution of the tests.

EE/CA. The Former H. Smart Field, Macon, GA. USAESCH. She was responsible for conducting detailed record reviews, performing a site reconnaissance, and presenting the findings and risk reduction alternatives for this suspected chemical warfare materiel (CWM) site in the EE/CA document.

Restoration Advisory Board (RAB). The Former Camp Croft, Spartanburg, SC. USAESCH. Ms. McKinney established and continues to coordinate the activities of the RAB, which is comprised of diverse community members. Coordination of activities for this site includes: development and implementation of the community relations plan, preparation and presentation of relevant project-related materials, conduct of public meetings, and serving as a liaison between the RAB, USAESCH, USACE Charleston, the community, US EPA and state regulatory agencies. In addition, Ms. McKinney manages on-site support personnel during intrusive activities.

JASON E. SHIFLET, PG
TASK ORDER MANAGER

SUMMARY OF CAPABILITIES

- Environmental Site Assessments
- Field Investigations and Data Collection
- Geological Analysis and Interpretation
- Soil and Groundwater Assessments
- Global Positioning System (GPS) Surveys
- Geophysical Data Collection and Analysis
- Unexploded Ordnance (UXO) Investigations and Removals
- Subcontract Management and Evaluation
- Regulation Research, Review and Application
- Engineering Evaluation/Cost Analysis (EE/CA)
- CERCLA Time and Non-Time Critical Removal Actions
- Community Relations
- Internet and Database Research
- Technical Report Preparation

PROFESSIONAL REGISTRATIONS

Professional Geologist: North Carolina (2000)

EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

M.S., Geology, Clay Mineralogy Concentration, University of Georgia, Athens, GA (1999)
The Society of Sigma Gamma Epsilon, National Honorary Society of the Earth Sciences
B.S., Geology, Hydrogeology Concentration, Clemson University, Clemson, SC (1995)
The Society of Sigma Gamma Epsilon, National Honorary Society of the Earth Sciences
40-Hour OSHA Health and Safety Training 29 CFR 1910.120
8-Hour Supervisor Course 29 CFR 1910.120 (e) (4)
Member Geological Society of America
Member of Clay Minerals Society
Member of Groundwater Professionals of North Carolina
American Red Cross First Aid and CPR Certification
Environmental Equipment Training
Special Equipment Experience:
Scintag XDS-2000 Automated X-Ray Diffractometer
Leo 982 Low-field Emission Scanning Electron Microscope
Philips 400 Transmission Electron Microscope

PROFESSIONAL EXPERIENCE

Mr. Shiflet has three years of technical and managerial experience in a variety of environmental and engineering investigations and site remediations. He currently serves as a Geologist responsible for conducting assignments for government and private sector clients. Mr. Shiflet is proficient at conducting field surveys, historical reviews, soil and groundwater sampling, well installations, advanced groundwater remediation techniques, unexploded ordnance (UXO) investigations, geophysical surveys, and technical report preparation. Mr. Shiflet has participated in all aspects of various projects including project fee proposals, subcontract negotiations, project preparations, site management, data collection, data analysis, report composition, report review, and final quality assurance.

Mr. Shiflet was the site manager for an Engineering Evaluation/Cost Analysis (EE/CA) at a formerly used defense site (FUDS), Fort McClellan, Calhoun County, Alabama. The EE/CA involved areas of suspected unexploded ordnance (UXO) contamination and included records review, geophysical investigation, risk analysis and cost estimation. His involvement included subcontract negotiations for all related field tasks, including brush clearing, surveying, geophysical data collection and intrusive sampling. He also helped develop and review the project schedule and workplan for all field tasks. While in the field, he managed all field activities including brush clearing, surveying, geophysical data collection and intrusive sampling. His geophysical data collection experience includes use of the Geonics EM-61 electromagnetic induction time domain metal detector and the Geometrics G-858 portable cesium vapor magnetometer. The intrusive sampling effort involved the use of stringent safety protocols resulting in accident-free project completion. Mr. Shiflet co-wrote the EE/CA, which included a statistical evaluation of the data analysis, risk analysis, identification and recommendation of risk reduction alternatives and a cost estimate, all adhering to the CERCLA Non-Time Critical Removal Action guidance document.

Mr. Shiflet participated in the development of an Engineering Evaluation/Cost Analysis of an ordnance site at a formerly used defense site (FUDS), the Laurinburg-Maxton Army Air Base. His responsibilities included reviewing the geophysical work plans, reviewing equipment specification and investigation procedures and geophysical anomaly discrimination.

Mr. Shiflet participated in the preparation of the Recurring Review monitoring report for Mission Trails State Park, a formerly used defense site (FUDS), in San Diego, California. Project tasks included extensive historical document and internet research, conducting stakeholder interviews, preparation of the technical report and close coordination with the USAESCH, the US Army Engineering District, Los Angeles, the California Environmental Protection Agency and local community officials.

Mr. Shiflet assisted in a Comprehensive Site Assessment investigation and remediation using advanced groundwater remediation techniques on a leaky petroleum underground storage tank site at a government medical facility. Using Aggressive Fluid Vapor Recovery (AFVR) technology, Mr. Shiflet was responsible for conducting the AFVR events including data collection and analysis. The investigation included use of a Hydrovac 2000 vacuum truck, a

TVA-1000 Flame Ionization Detector (FID), an anemometer and a relative humidity meter. Data was used to determine the amount of collected liquid in the truck and expelled vapor from the vent stack.

Mr. Shiflet participated in the geologic interpretation and dredging feasibility study of the Cape Fear River channel in Wilmington, North Carolina for geotechnical report in cooperation with the Wilmington District of the US Army Corps of Engineers. His responsibilities included regional and site geologic descriptions, data analysis of the 266-channel soil/wash probe borings, recommendation of possible dredging methods based on channel geologic characterization and overall quality assurance.

Mr. Shiflet participated in a petroleum underground storage tank assessment for a Site Assessment Report (SAR) that involved the installation of Type II and Type III shallow monitoring wells and soil sampling at the former DeLand Naval Air Station in association with the Savannah District of the US Army Corps of Engineers. He was also involved with data interpretation, hydrogeologic characterization and cross-section development. Further responsibilities included describing the regional and local site geology and its relationship to the generated cross-sections.

Mr. Shiflet participated in a petroleum underground storage tank assessment for a Site Assessment Report (SAR) that involved the extensive intrusive sampling of an active army installation, Ft. Stewart, in cooperation with the Savannah District US Army Corps of Engineers. As the team lead geologist, he was responsible for monitoring data collection using direct push (Geoprobe) methods, soil profile characterization, soil and groundwater sampling, and piezometer installation/deinstallation. He also collaborated with other geologists on Type II monitoring well installations.

Mr. Shiflet has participated on a consulting and primary investigator basis on numerous geotechnical exploratory studies involving the advanced analytical techniques x-ray diffraction and electron microscopy. His experiences include development of investigation methodologies, data collection and data interpretation using equipment such as the Scintag XDS-2000 Automated X-Ray Diffractometer, the Leo 982 Low Field-Emission Scanning Electron Microscope and the Philips 400 Transmission Electron Microscope.

JOHN A. SOYAK, MSPH, CIH
CERTIFIED INDUSTRIAL HYGIENIST

SUMMARY OF CAPABILITIES

- Health and Safety Manager
- Development and Implementation of Safety and Occupational Health Plans
- Indoor Air Quality
- Hazardous Waste Management
- Environmental Program Management
- UXO/CWM Military Experience

EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

BS, Biology-Chemistry, Central Michigan University, 1964
MS, Biology, Central Michigan University, 1966
MSPH, Environmental Sciences, University of North Carolina, 1970
40 Hour HAZWOPER Course (29 CFR 1910.120)
8-Hour Supervisor Course (29 CFR 1910.120 (e)(4))
Advanced Industrial Hygiene Course
Asbestos Control Procedures
Certification Comprehensive Practice of Industrial Hygiene
Diplomate, American Academy of Industrial Hygiene
Member of the American Hygiene Association and the American Chemical Society

PROFESSIONAL EXPERIENCE

Mr. Soyak has more than 35 years extensive experience in environmental and occupational safety and health. He is responsible for developing plans and implementing safety and health programs and providing training. Mr. Soyak conducts indoor air quality studies, evaluates building air conveyance systems and presents expert legal testimony on indoor air quality. He was the principal Certified Industrial Hygienist for the provision of industrial hygiene and quality assurance services at various military installations. He was responsible for the development of a Comprehensive Health Hazard Assessment on Eglin Air Force Base Range Target Vehicles for USAF Armstrong Laboratory. Mr. Soyak has directed baseline industrial hygiene surveys at five major military installations for Department of Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland. Served as lead instructor for the conduct of OSHA 40-hour Hazardous Waste Site Worker courses for U.S Navy bases and industrial clients throughout the United States. Mr. Soyak has provided technical consultation to project engineers and program managers in occupational and environmental health matters, instituted health hazard assessments for developmental items, prepared human volunteer protocols, conducted design reviews for construction projects and hazardous waste remediation projects, and served on numerous Department of Defense and Army task forces to develop chemical safety policy and procedures. Mr. Soyak is an experienced manager responsible for providing oversight and quality assurance for projects for government and private clients; and completing and submitting appropriate government-required documentation and permit applications.

Mr. Soyak has evaluated indoor firing ranges to determine airborne lead exposures and existing work practices and control measures; developed and coordinated lead medical surveillance programs for

personnel involved with lead paint abatement; developed lead training manuals for workplaces; and performed oversight and quality assurance during lead abatement activities.

Mr. Soyak has directed and performed numerous asbestos surveys and quality assurance evaluations during asbestos projects. While conducting these surveys, Mr. Soyak determined locations, quantities, and physical condition of asbestos.

As Environmental Group Leader, he conceived, coordinated, and managed the development of environmental and occupational health elements for the Department of Army Chemical Stockpile Disposal Program and the Army's Installation Restoration Program. Mr. Soyak has firsthand experience in developing and implementing safety at UXO and CWM sites.

CHARLES ROSE
UXO QUALITY CONTROL/SAFETY OFFICER

SUMMARY OF CAPABILITIES

- Unexploded Ordnance (UXO) Investigations
- UXO Quality Control
- Subcontract Management
- Engineering Evaluation/Cost Analysis (EE/CA)
- CERCLA Time and Non-Time Critical Removal Actions
- Ordnance plan development and implementation

EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

BS Political Science
Naval School Explosive Ordnance Disposal Surface Phase
Naval School Explosive Ordnance Disposal Nuclear Phase
British Army Improvised Explosive Devices Course (NATO)
EOD Instructor Training Course
40-Hour HAZWOPER
8-Hour HAZWOPER Supervisor Course

PROFESSIONAL EXPERIENCE

Mr. Rose has over 15 years experience in the ordnance (unexploded and chemical warfare material) arena. He is currently responsible for addressing explosive operational risk, scrap handling, range management activities, safety exclusion zones, explosive transportation, storage, destruction, and safety compliance under the Corporate Ordnance Program. He also develops and implements plans for explosive operations, conducts UXO sampling activities, UXO removal and disposal operations, UXO QC, and manages UXO subcontractors. Mr. Rose has additional experience in budget, cost control, and cost estimating.

Mr. Rose experience as a UXO QC/Safety Officer include:

- **Quality Control.** Responsible for overall quality control for a Chemical Warfare Material Removal project at Dunn Field. Also responsible for the Chemical Warfare Material and Hazardous Toxic Waste sampling program.
- **EOD Section Sergeant.** Planned and implemented US Army EOD support for both the US and Dutch armies at the Port of Emshaven, NE during Operation Desert Shield. Responsible for training and operations of four EOD teams which disposed of over 500,000 pounds of ordnance, under combat and without casualties during Operation Provide Comfort in northern Iraq.

- Instructor. Supervised seven instructors as the Non-Commissioned Officer-In-Charge of the EOD Phase 3 course of instruction.
- Trained military personnel as EOD Team Leaders and EOD Section Sergeants at the EOD Basic and Advanced Non-Commissioned Officer Course.

T.J. DIE
UXO QUALITY CONTROL/SAFETY OFFICER

SUMMARY OF CAPABILITIES

- Unexploded Ordnance (UXO) Investigations
- UXO Quality Control
- Subcontract Management
- Engineering Evaluation/Cost Analysis (EE/CA)
- CERCLA Time and Non-Time Critical Removal Actions

EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

Naval School Explosive Ordnance Disposal Detachment (EOD)
40-Hour HAZWOPER
8-Hour HAZWOPER Supervisor Course

PROFESSIONAL EXPERIENCE

Mr. Die has over 30 years experience providing UXO services (unexploded and chemical warfare material) to private and government clients. He is currently responsible for addressing explosive operational risk, scrap handling, range management activities, safety exclusion zones, explosive transportation, storage, destruction, and ensuring safety compliance under the Corporate Ordnance Program. Mr. Die conducts UXO sampling activities, UXO removal and disposal operations, UXO QC, and manages UXO subcontractors.

Mr. Die's experience as a UXO Supervisor include:

- Dunn Field. Supervised team in the location, excavation, and recovery of WWII chemical munitions and chemical test sets.
- ATT-OES, Augustine Metals. Supervised UXO team involved in the location and segregation of live OE items in an active, commercial scrap yard.
- Dicks Auto Works. Supervised the inspection and segregation of 6,000 tons of ordnance explosives from other scrap metal at salvage yard. Recovered and explosively vented suspected UXO's.
- Fort Meade. UXO avoidance for test well drilling crew. Located and marked UXO for disposal.
- Camp Croft. Locate, recovered, and detonated numerous UXO over large training area.
- Sandi Hook Test Firing Range. Team leader responsible for locating, recovering, and detonation of UXO.

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CHAPTER 1

OVERVIEW

1.1 INTRODUCTION

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

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

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

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

CHAPTER 2 BACKGROUND

2.1 The former Camp Croft Training Facility comprised approximately 19,044.46 acres and is approximately 5 miles southeast of Spartanburg, South Carolina. Current land usage is approximately 7,088.08 acres for Croft State Park, 4,936.24 acres for farming, 256 acres for private industry, and 6,764.14 acres of residential use, to include a public golf course. This Work Plan pertains to Ordnance Operable Units (OOU) 1B, 7, 2, and 3 as identified by the Engineering Evaluation/Cost Analysis (EE/CA), Former Camp Croft, January 1996 and area A39 as identified by the Supplemental Archives Report.

2.2 OBJECTIVE

2.2.1 Safely locate, identify, and dispose of all surface and subsurface UXO to a depth of two feet for those areas specified in Task 4 of Task Order 012 [See Appendix A].

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

2.3 The site map located at Appendix C generally describes the location of each site, and shows Camp Croft's overall location.

CHAPTER 3

SITE CONDITION

3.1 The former Camp Croft Training Facility comprised approximately 19,044.46 acres and is approximately 5 miles southeast of Spartanburg, South Carolina. Current land usage is approximately 7,088.08 acres for Croft State Park, 4,936.24 acres for farming, 256 acres for private industry, and 6,764.14 acres of residential used to include a public golf course. This work plan pertains to Ordnance Operable Units (OOU) 1B, 7, 2, and 3 as identified by the Engineering Evaluation/Cost Analysis (EE/CA), Former Camp Croft, January 1996, and Area A39 as identified by the Supplemental Archives Report.

3.2 The local Croft Volunteer Fire Department will provide fire protection for the site. The area is also served by a 911 emergency service. Ambulance services are available from the Croft Volunteer Fire Department. The nearest hospital is the Spartanburg Regional Hospital, located in Spartanburg S.C., approximately 10.3 miles north of the site. "Life Flight" is available from the Spartanburg Regional Hospital and the decision to transport via Life Flight will be made by the on site emergency medical personnel.

3.3 Each site is described in the following paragraphs. The width of the horse trails varies from a narrow path to the width of a vehicle road bed.

3.3.1 Ordnance Operable Unit-1B. OOU-1B is approximately 65 acres located in the center of the park and used for surface recreation. During the EE/CA, 60mm and 81mm mortars were found. This area will be surface cleared with the exception of the horse trails. The horse trails shall be cleared to a depth of two feet to include 10 feet on either side of the trail.

3.3.2 Ordnance Operable Unit-7. OOU-7 is approximately 170 acres located in the vicinity of Croft State Park office and campgrounds. It is the Park's busiest area. OOU-7 shall be subsurface cleared to two feet. During the Time Critical Removal Action (TCRA) and the EE/CA performed on OOU-7, 60mm and 81mm mortars, 2.36 inch rocket parts, and small arms were found.

3.3.3 Ordnance Operable Unit 2. OOU-2 is a 325 acre area located on the east side of the park, approximately 0.7 mile from State Highway 295. Activities performed in OOU-2 are generally limited to recreational surface use which includes hiking and horseback riding. During the EE/CA performed on OOU-2, 60mm and 81mm mortars, 4.2 inch mortar parts, and small arms were found. OOU-2 shall be surface cleared only except for the horse trails. The horse trails shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 5,700 feet long.

3.3.4 Ordnance Operable Unit-3. OOU-3 is located on private residential property. A Mk II hand grenade, practice grenades, and grenade parts and fragmentation were found during the EE/CA. This area is approximately 11 acres and shall be cleared to a depth of two feet.

3.3.5 Area 39. Area 39 was identified in the Supplemental Archive Search Report as a potential OE area. This area consists of clearance of the horse trails, which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 6,375 feet long.

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 HFA will begin operations in OOU-7, followed by OOU-1B, Area 39, and OOU(s)-2 & 3. The order of operations was designated during the site visit and in phone conversations with the CEHNC PM, Ms. Patti Berry. Priorities and the order of operations are subject to change. If the need arises to change priorities, the SUXOS will be notified in advance by the CEHNC PM. Each designated site will receive an investigation and clearance as outlined in this work plan and Task 4 of the SOW. During the surface clearance, magnetometers will be used to aid searchers in areas of heavy brush and leaf falls. All subsurface anomalies will be excavated to a depth of *two feet* and investigated to determine their identity. Excavations deeper than two feet 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 normally be completed by hand. Large anomalies, or those deeper than two feet, may be excavated with mechanized equipment. The decision to mechanically excavate will be determined on site and in conjunction with the CEHNC Site Safety Specialist. All UXO that are discovered will be detonated in place or on the site where they were found.

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 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.

4.2 DETERMINING BOUNDARIES & ESTABLISHING SEARCH GRIDS/LANES

4.2.1 SITE SPECIFIC OPERATIONS

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

4.2.1.2 Individual grids will be established as outlined in Chapter 7 of this WP. The 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 foot search lanes, oriented north to south. The southwest corner stake will be conspicuously painted and marked with that grid's identification number.

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

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

4.2.2 UXO SITE OPERATIONS

4.2.2.1 The order of site operations and the location and boundaries of each site were determined by the CEHNC, the ASR and information gained during the site visit. The order and priorities of operations may be modified by written notice of the CEHNC PM or her representative.

4.2.2.2 Ordnance Operable Unit-7

4.2.2.2.1 OOU-7 is approximately 170 acres located in the vicinity of Croft State Park office and campgrounds and is the Park's busiest area. OOU-7 will be subsurface cleared to a depth of two feet.

4.2.2.2.2 This site has varied terrain, it ranges from wooded hilly areas to open campgrounds with paved roads and parking areas. The park area will remain closed during OE Removal Operations.

4.2.2.2.3 HFA will establish temporary control monuments based on the data provided by CEHNC. These monuments will be used by HFA personnel to layout and establish the grid network. The grid network will consist of 100ft X 200ft grids if possible or grids of a size and shape determined by the Senior UXO Supervisor (SUXOS) that best fit the area.

4.2.2.2.4 Some brush removal will be necessary to allow UXO teams access to the area for OE search and removal. Brush will be cleared only to the extent necessary. Chainsaws and brush cutting hand and power tools will be used for this operation.

4.2.2.3 Ordnance Operable Unit-1B

4.2.2.3.1 OOU-1B is approximately 65 acres located in the center of the park and used for surface recreation. During the EE/CA 60mm and 81 mm mortars were found in this area. This area will be surface cleared with the exception of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail.

4.2.2.3.2 As with other sites the terrain is hilly and tree covered, some brush removal will be required to lay out the area and allow access by the UXO removal teams. Brush will only be removed to the extent necessary to perform surveys and establish the grid network.

4.2.2.3.3 HFA will establish temporary control monuments based on the data provided by CEHNC. These monuments will be used by HFA personnel to layout and establish the grid network. The number and locations of these monuments will be determined by the size and shape of the site. The grid network will consist of 100ft X 200ft grids if possible or grids of a size and shape determined by the Senior UXO Supervisor (SUXOS) that best fit the area.

4.2.2.3.4 A subsurface search and removal will be performed only on the horse trails. The width of these trails varies from old road beds of approximately 20 feet in width to simple paths of only a few feet in width. The horse trails will be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 3,000 feet long.

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

4.2.2.4 Area 39

4.2.2.4.1 Area 39 was identified in the Supplemental Archive Search Report as a potential OE area. This area consists of the horse trails which will be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 6,375 feet long.

4.2.2.4.2 Since this site requires only a subsurface removal to be performed on the horse trails, grids established will be as before, red flags will mark the areas searched and cleared, flags will not be removed until the area has received a satisfactory QC and QA check.

4.2.2.4.3 Some brush removal or cutting may be required to layout or survey the trails. Because the removal is limited to the horse trails, survey monuments will not be installed on the site. The clearance area will be tied to the base digital maps provided by CEHNC.

4.2.2.5 Ordnance Operable Unit 2

4.2.2.5.1 OOU-2 is a 325 acre area located on the east side of the park, approximately 0.7 mile from State Highway 295. Activities performed in OOU-2 are generally limited to recreational surface use such as hiking and horseback riding.

4.2.2.5.2 During the EE/CA performed on OOU-2, 60mm and 81mm mortars, 4.2 inch mortar parts, and small arms were found. OOU-2 shall be surface cleared only with the exception of the horse trails. Horse trails be cleared to a depth of two feet to include 10 feet on either side of the trail. The length of the horse trails is approximately 5,700 feet.

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

4.2.2.5.4 Grids will be established as in the previous sites. Grids will generally be 100ft X 200ft, but the size and shape may be altered by the SUXOS to best fit the area being investigated. The goal is to perform an effective surface search and removal.

4.2.2.5.5 Some brush removal will be necessary to gain access to the site and allow clear lines for surveying. Brush removal will be kept to a minimum and will normally entail trimming and hand cutting of brush and small trees.

4.2.2.5.6 Magnetometers will be used to aid the UXO teams while searching in heavy vegetation, or leaf mulch. There will be no intrusive activities performed in areas designated for surface removal only, vegetation or leaves may be moved aside to ensure that a contact is not hidden by the vegetation.

4.2.2.5.7 A subsurface search and removal will be performed only on the horse trails. The width of these trails varies from old road beds of approximately 20 feet in width to simple paths of only a few feet in width. The horse trails will be cleared to a depth of two feet to include 10 feet on either side of the trail. The length of the trails is approximately 5,700 feet.

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

4.2.2.6 Ordnance Operable Unit-3

4.2.2.6.1 OOU-3 is located in a private residential community. The area has numerous houses nearby and ongoing residential construction. A MkII hand grenade, practice grenades, and grenade parts and fragmentation were found during the EE/CA. This area is approximately 11 acres and shall be cleared to a depth of two feet.

4.2.2.6.2 Because of the sensitive fuzes used in hand grenades moving them is not a safe option. If a situation arises where a UXO cannot be detonated in place the CEHNC Site Safety Specialist will be notified so he can contact the nearest U.S. Army EOD Unit for assistance. The item will not be left unattended, HFA personnel may provide security if

required until the item is turned over to the U.S. Army for disposition.

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

4.2.2.6.4 Grids will be established as in the previous sites. Grids will generally be 100ft X 200ft, but the size and shape may be altered by the SUXOS to best fit the area being investigated. The goal is to perform an effective surface search and removal.

4.2.2.6.5 Brush removal will not be required in this site. Particular care will be exercised in this site to preserve or return the areas investigated to their original condition.

4.2.2.7 Protection of personnel and property are critical elements of any removal action performed in this site. Engineering controls must be employed during intrusive excavations to protect nearby structures and personnel. Evacuation should be the primary method of protecting people. The location of underground utilities must be determined before excavations or in place detonations occur. Contact the local utilities provider for assistance in locating buried utilities.

4.2.2.8 The aluminum structures, currently in use at other HFA project sites, will satisfy this requirement for engineering controls. During intrusive activities, tamping UXO that are to be detonated in place with earth or sand cover will provide adequate protection for property.

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.

4.3.1.2 A standard surface search and removal will be performed over each site. Magnetometers may be used to aid sweep crews in areas of heavy vegetation or in wooded areas where there is a heavy leaf fall covering the ground. No excavations or intrusive efforts other than moving the leaves or vegetation to investigate an unseen anomaly will be performed.

4.3.1.3 Surface debris will receive a 100% inspection and will be segregated as UXO, UXO related, or non-UXO scrap. All metallic debris will be removed from the grid. Non-UXO related scrap, 1 sq. in. and larger, will be stockpiled nearby. Non-UXO Scrap will be turned over to a local scrap dealer, at no cost to the government or HFA. UXO related

scrap inspected and determined to be positively free of explosives will also be turned over as scrap, if acceptable to the scrap dealer.

4.3.1.4 UXO and explosive contaminated scrap will be disposed of each day by detonating in place those items that are determined unsafe to move, or if possible consolidating those items within a grid that are safe to move and detonating them.

4.3.2 SUBSURFACE SEARCHES

4.3.2.1 All grids in the areas designated for sub surface 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 crossed flags for destruction at the end of each work day.

4.3.2.2 Grid search lanes will be established in a north/south direction. Sweep lanes will be marked with 1/4" 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 each significant anomaly located in each grid. Anomalies will be recorded in the manner and format further described in Chapter 7.

4.3.3 RECORDING SITE DATA

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

4.3.3.2 Completed grid sheets will be turned over to the 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 at that time. The grid markers will not be removed until all grids have received a QC check by the HFA QC Officer and QA certification by the CEHNC on site QA/Safety Specialist.

4.3.4 INTRUSIVE OPERATIONS

4.3.4.1 Excavations will only be performed by qualified UXO personnel. If the UXO Supervisor cannot immediately and positively identify the UXO, he will request assistance from the QC/SSO.

4.3.4.2 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. When the hole is clean, it will be refilled and tamped.

4.3.4.3 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 from or to any other area or grid.

4.3.4.4 All unsafe to move UXO located will be marked with crossed red and yellow flags, and destroyed in place. In order to conserve explosives and set up time, and if the UXO are safe to move, they may be consolidated within a grid for destruction. Because of the anticipated schedule, detonations may be scheduled between the hours of 1600 and 1730 each day. In no case will UXO remain over night unless appropriate security is posted. All detonations of UXO are planned to occur at the end of each work day.

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 Croft State Park Rangers' 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 most common ordnance item found on the site. 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.

4.3.5.3 At least a 50m 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 steeltoes), and safety sunglasses. A hat is optional, but strongly recommended, for protection from the sun. Hardhats are required if a potential head injury could result from an overhead hazard. Steel toed boots shall be worn on or around heavy equipment or if a foot hazard exists. Additional protective clothing, in accordance with EM 385-1-1, will be worn when personnel are using chainsaws and weed eaters.

4.3.7 SCRAP REMOVAL

4.3.7.1 Scrap removal is essential in order to successfully complete the subsurface magnetometer survey of each grid. Non UXO scrap will not be removed from

areas/grids which received a surface clearance only. Scrap is defined as metallic debris which is not contaminated with explosives. The scrap could be made up of UXO related material as long as:

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

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

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

4.3.7.5 The scrap will be segregated into UXO related and non-UXO related scrap. 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 escorted by either the SUXOS or a UXOS.

4.3.8.2 All loads will be visually inspected by the SUXOS or QC to ensure they are properly secured and safe to move. All materials will be loaded and transported in accordance with local, state and federal regulations.

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

4.3.8.4 Explosives will be transported only on the designated routes. When transporting explosives or UXO, vehicles will not exceed 25 mph. In many areas a prudent speed may be less than 25 mph, in which case the driver may not exceed a safe and reasonable speed.

4.3.8.5 Blasting caps and high explosives will remain separated at all times during transport. Suitable metal containers will be used for this purpose. 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 at all times, except when actually using the materials.

4.3.8.6 Vehicles transporting explosives will be placarded with a Department of Transportation "Explosives Class 1.1" placard or placarded as directed by the post's regulations. Class 1.1 consists of explosives that have a mass explosion hazard.

4.3.9 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS

4.3.9.1 All explosives and demolition materials will be stored in two earth covered arch type magazines located on state park land. The magazines were previously approved for use during other phases of this project. (The lighting arresters and grounding systems for these magazines will require re-checking and repairs if necessary.) The SUXOS will be responsible for the safe handling of all explosives.

4.3.9.2 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. Electrical procedures will be employed as the method of choice for all detonations and all demolition shots will be tamped.

4.3.10.2 Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an event—such as inclement weather—prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS is responsible for determining whether or not minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify the Croft State Park Ranger 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 an electric initiation system.

4.3.10.3.1.1 Test and maintain control of the blasting machine.

4.3.10.3.1.2 Test the blasting circuit tester.

4.3.10.3.1.3 Test the firing wire on the reel, shunted and unshunted.

4.3.10.3.1.4 Lay out the firing wire completely off the reel.

4.3.10.3.1.5 Retest the firing wire, shunted and unshunted.

4.3.10.3.1.6 Test the blasting caps.

4.3.10.3.1.7 Connect the circuit.

4.3.10.3.1.8 Connect the firing wire.

4.3.10.3.1.9 Test the entire circuit.

4.3.10.3.1.10 Prime the charges.

4.3.10.3.2 Testing and Maintaining Control of Blasting Machine

4.3.10.3.2.1 The blasting machine will be tested each day as specified in the manufacturer's instructions.

4.3.10.3.2.2 The SUXOS or a designated Demolition UXOS for that day's UXO disposal activities is responsible to maintain control of the blasting machine at all times. This responsibility cannot be delegated.

4.3.10.3.3 Testing the Blasting Circuit Tester

4.3.10.3.3.1 The blasting circuit tester will be tested each day as recommended in the manufacturer's instructions.

4.3.10.3.3.2 Both the open-and short-circuit tests will be performed.

4.3.10.3.4 Testing the Firing Wire on the Reel

4.3.10.3.4.1 The firing wire leads will be separated at both ends and the leads at one end connected to the post of the blasting circuit tester. When using the needle type blasting circuit tester, no deflection should be noted. When using the digital type blasting circuit tester, the number on the digital readout should remain constant.

4.3.10.3.4.2 The wires will be shunted at one end and the leads of the other end connected to the blasting circuit tester. When using the needle type circuit tester, the needle should travel at least 50% of the scale. When using the digital type blasting circuit tester, the number should increase to indicate continuity.

4.3.10.3.4.3 Both ends of the firing wire will be shunted after testing.

4.3.10.3.5 Laying Out the Firing Wire

4.3.10.3.5.1 After locating a safe firing position, the wire will be laid out between the firing point and the charge.

4.3.10.3.5.2 Vehicles will not drive over and personnel will not walk on the firing wire.

4.3.10.3.5.3 The wire will be as short as possible. Loops in the wire will be avoided and it will be laid as flat as possible.

4.3.10.3.6 Retesting Firing Wire

4.3.10.3.6.1 The open- and short-circuit tests will be performed again. The process of unreeling the wire may separate broken wires not found in previous tests.

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

4.3.10.3.6.3 Both ends of the firing wire will be shunted after the tests are complete.

4.3.10.3.7 Testing Electric Blasting Caps

4.3.10.3.7.1 The cap will be removed from its container. The wire will be wrapped around the palm of the hand twice. This procedure will prevent tension on the cap wires and dropping the cap.

4.3.10.3.7.2 The cap wires will be stretched to their full length. Care will be taken not to kink them. The cap(s) will be placed under a sandbag, while stretching out the lead wires.

4.3.10.3.7.3 The cap(s) will be tested away from all other personnel. Personnel will keep their backs to the cap when testing it.

4.3.10.3.7.4 Cap wires will always be shunted when not being tested.

4.3.10.3.8 Connecting a Circuit

4.3.10.3.8.1 When two or more blasting caps are required for a dual primed demolition operation, a common parallel circuit will be used. The following procedures will be used:

A) All blasting caps will be tested separately before being connected in a circuit.

B) The blasting cap wires will be joined together using the Western Union pigtail splice. All joints will be protected in the circuit with electrical tape.

C) The entire circuit will be tested. After testing the circuit, the two free ends of the cap wires will be shunted and kept shunted until they are to be connected to the firing wire.

4.3.10.3.9 Connecting the Firing Wire

4.3.10.3.9.1 The free ends of the blasting caps will be connected to the firing wire before priming the charges or taping a cap to detonating cord.

4.3.10.3.9.2 The connections will be insulated with tape.

4.3.10.3.10 Testing the Entire Firing Circuit

4.3.10.3.10.1 Before priming any charges, the circuit will be tested from the firing point. The following procedures will be used:

A) The caps will be placed at least 25 feet from the charge, under protective sandbags, while performing this test.

B) The ends of the firing wire will be connected to the blasting circuit tester and when using the needle type tester, the needle should deflect to at least half scale. When using the digital type tester, the number should increase to indicate continuity. (If there is no deflection, the system will have to be checked to locate the break in the circuit.)

C) The ends of the firing wire will then be shunted.

4.3.10.3.11 Priming the Charges / Returning to the Firing Point

4.3.10.3.11.1 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.

4.3.10.3.11.2 The blasting cap(s) will be connected to a detonating cord trunk line or ring main system.

4.3.10.3.12 Initiating the Circuit

4.3.10.3.12.1 At this point the ignition system is complete. The blasting machine will not be connected until all personnel are accounted for and perimeter security is verified. The SUXOS, or the 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.

4.3.10.4 Detonating UXO in Place

4.3.10.4.1 Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1730 hours. All detonations will be conducted in accordance with 60A1-1-31.

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

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

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

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

4.3.10.4.6 During detonations, a designated project vehicle will remain in the safe area to provide emergency egress for the demolition team.

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

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

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

4.3.10.5 Misfire Procedures

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

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

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

4.3.10.5.2 Electric Misfires

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 blasting machine or power source terminals will be checked. The blasting machine or power source will be disconnected and the blasting circuit tested. The continuity of the firing wire will be checked with a circuit tester.

4.3.10.5.2.3 Another blasting machine or power source will be used to attempt to fire the circuit again. Blasters will be changed and the procedures repeated.

4.3.10.5.2.4 Thirty minutes will lapse prior to the inspection of an electrical misfire. The entire circuit will be checked for wire breaks or short circuits. If it is suspected that the electric blasting cap is the problem, no attempt will be made to remove or handle the electric blasting cap. 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 blasting cap will be attached to the remaining detonating cord, with care taken to fasten it properly, and the original charge will be detonated.

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

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

- A) Investigation will not occur until 30 minutes after the charges have stopped burning.
- B) The charge will be re-primed and another attempt will be made to detonate the charge.
- C) Scattered charges that do not contain blasting caps may be collected and detonated together.

4.4 NOTIFICATION

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

CHAPTER 5

TECHNICAL & MANAGEMENT PLAN

5.1 APPROACH, METHODS, AND OPERATIONAL PROCEDURES

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

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

5.1.3 A systematic search of the 5 areas identified in the SOW will be by laying out a grid network and documenting the search, location, QC, and QA of each grid.

5.2 The grids/areas identified for subsurface removal will be investigated using ferrous magnetic locators. UXO Teams will then excavate and determine the identity of each subsurface anomaly. In the areas designated for surface sweeping and UXO removal, UXO teams may use magnetometers to aid their search in areas of heavy leaf falls or other vegetation. All UXO will be detonated in place. All other UXO scrap and UXO related material determined to be free of explosive residue will be vented if required and turned over to a local commercial scrap dealer.

5.2.1 All significant contacts in each grid will be plotted and recorded by the UXOS. Each day's data will be inspected by the QC officer , processed in the site's data base and then turned over to the UXO Mapping Supervisor. Daily reports will be generated from the data base by the QC officer and provided to the SUXOS.

5.2.2 DESCRIPTION OF ORDNANCE LOCATORS TO BE USED

5.2.2.1 HFA will use Schonstedt Model 52CX Flux Gate Magnetometers. These magnetometers have been furnished by the government.

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

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

properly. Failure to detect the test target is reason to reject the instrument and return it to the manufacturer for repairs.

5.2.2.4 During subsurface magnetometer searches, the magnetometers will be set on their highest sensitivity setting. If, during the search, this setting does not permit discrimination, the magnetometer sensitivity may be reduce to no lower than the setting determined in para 5.2.2.3.

5.2.3 COMPOSITION AND MANAGEMENT OF TEAMS

5.2.3.1 Project Headquarters Element

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

5.2.3.2 UXO Search Teams

5.2.3.2.1 Three UXO search teams will be used to perform UXO removal operations. One team will initially be used for site layout and gridding, and then transition to UXO removal activities. Each team will be composed of one UXOS and four UXO Specialists. Each team will be under the direct supervision of the UXOS. All field operations will be under the overall supervision of the SUXOS.

5.2.3.2.2 Search teams will be responsible for:

5.2.3.2.2.1 establishing and laying out the search lanes;

5.2.3.2.2.2 operating magnetometers and metal detectors;

5.2.3.2.2.3 marking, plotting, and recording all UXO/UXO related materials located during grid searches;

5.2.3.2.2.4 identifying and classifying UXO and UXO components;

5.2.3.2.2.5 conducting explosive disposal procedures of UXO;

5.2.3.2.2.6 and segregating and removing all scrap from each grid.

5.2.3.3 UXO/Grid Team

5.2.3.3.1 The UXO/Grid Team will be made up of one UXOS and four UXO persons. The team will be subdivided into a Total Station operator, a Rod Man, a

Schonstedt operator and a stake man. The necessary materials for laying out grids will be carried from point to point by the team.

5.2.3.3.2 The team will be responsible for:

- 5.2.3.3.2.1** locating and establishing grids;
- 5.2.3.3.2.2** marking and identifying each grid;
- 5.2.3.3.2.3** coordinating, processing, and transmitting data;
- 5.2.3.3.2.4** coordinating with the licensed land survey crew; and
- 5.2.3.3.2.5** performing UXO Remediation when directed by the

SUXOS.

5.2.4 METHOD OF TRANSPORTING UXO TO THE SAFE HOLDING AREA

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

5.2.5 PROTECTIVE MEASURES TO BE EMPLOYED

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

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

5.2.5.1.2 If inhabited buildings/structures are within the safety distance, the UXO Coordination Center will coordinate their evacuation and keep the area secured until UXO removal actions are completed.

5.2.5.1.3 In the case of planned detonations, the item(s) to be detonated will be tamped with a minimum of four feet of sand or sand bags. The area will be evacuated and secured to the maximum frag distance for the item to be detonated.

5.2.6 LAYOUT OF THE GRID SYSTEM

5.2.6.1 The boundary of the area was determined by the ASR and CEHNC. A licensed land surveyor will plot and mark the site's boundary using the NAD83 South Carolina State Plane. The location of grids will be digitally plotted on the area map provided by CEHNC.

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

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

5.2.6.4 UXO and other significant anomalies will be plotted on an HFA UXO Grid Location Form [*see Appendix E*] by the UXOS, IAW para 7.3, using an XYZ coordinate system measuring from the southwest corner of each grid. All Y coordinates will be referenced from the south grid boundary measured to the north, and all X coordinates will be from the western grid boundary measured to the east. The Z coordinate will be the depth at which the UXO was located. The Z coordinate or depth will not be recorded for areas/grids which received a surface clearance only.

5.2.6.5 Each UXOS will submit all of his completed grid forms to the QC officer at the end of each working day. The QC officer will review each grid form for completeness and accuracy. After review, the information on all forms will be entered into the site's data base and digital maps by the UXO mapping and data supervisor. The UXO/Grid Team will provide updated maps to the SUXOS as required.

5.2.7 GANTT CHART OF PROJECT

5.2.7.1 A Gantt chart depicting project schedules and milestones is provided at Figure 1.

5.2.8 ESTIMATED COST FOR THE SCHEDULED WORK

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

5.2.9 REQUIRED REPORTS

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

5.2.9.1.1 Weekly Project Summary [*see Appendix F*]

5.2.9.1.2 Weekly QC/Safety Report [*see Appendix F*]

5.2.9.1.3 Weekly QC Report [*see Appendix F*]

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

5.2.9.2.1
events for the project site.

A Monthly Summary will be provided of operations and

5.2.9.2.2
of the event.

Progress/Meeting Reports will be submitted within 10 days

5.2.9.2.3
days of project completion.

A draft Final Removal Report will be provided within 30

5.2.9.2.4
of CEHNC comments.

A revised Final Removal Report within 30 days after receipt

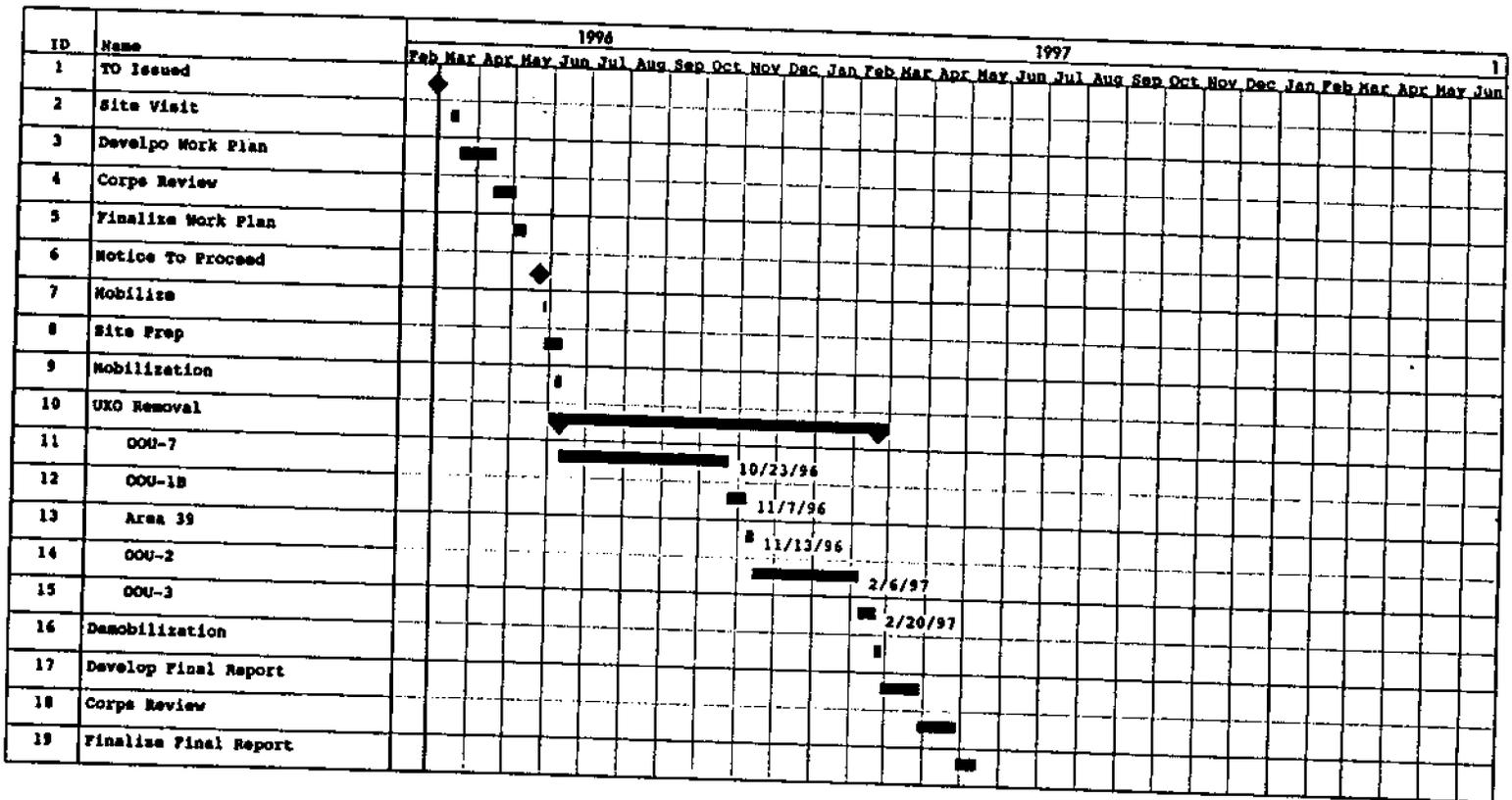


FIGURE 1
GANTT CHART

LABOR TYPE	Task 1		Task 2		Task 3		Task 4		Task 5		Task 6		Task 7		Total Hr	Unk Cost	Cost
	Site Visit	Work Plan	Mob	Com Rel	Mapping	OEW Remv	Turn-in	QC	Demob	Final Rpt							
CIH	0	8				4									12	\$85.07	\$1,020.84
Project Mgr	44	60	24	40	40	272				40	10	24	24	120	650	\$48.85	\$30,452.50
QC Spec	0		8		0	0		80		1268		24	24	1402	1402	\$37.49	\$52,560.98
Sr UXO Sup	44	48	24	20	215	1422	4				24	80	80	1681	1681	\$41.32	\$77,722.92
Site Safety Office	40	48	24		50	1272	4	20			24	4	4	1486	1486	\$41.32	\$61,401.52
UXO Specialist	0		112		2120	14256	96				72			18658	18658	\$35.42	\$589,955.52
UXO Sup	0		24		530	3492	96				24			4168	4168	\$37.49	\$156,183.34
Fld Adim/Clerk		30				1348							30	1408	1408	\$18.75	\$23,550.50
Laborer						1348								1348	1348	\$19.09	\$25,695.14
																	\$1,018,543.28
MATERIALS																	
Site Trailers	\$4,700.00																
Office Supplies/Ptpr	\$8,000.00																
Field Equip	\$17,500.00																
Vehicles	\$85,780.00																
ATV	\$18,000.00																
Fuel	\$10,200.00																
Magnetometers	GFE																
Radios	\$3,000.00																
Explosives	\$2,000.00																
Telephones	\$1,250.00																
Soil Sampling	\$0.00																
Sanitary Facilities	\$1,050.00																
Security/Service	\$48,512.00																
Surveying	\$15,000.00																
GPS	\$10,000.00																
Trans/Shipping	\$5,500.00																
Misc	\$8,500.00																Plus G&A
TOTAL	\$210,272.00																\$233,401.92
TRAVEL																	
Travel	\$1000 /trip	\$1,500.00	\$13,500.00				\$11,500.00										
Per Diem	\$26/day	\$260.00	\$13,104.00				\$112,036.00										
Lodging	\$48/day	\$382.00	\$2,058.00				\$211,850.00										Plus G&A
		\$2,152.00	\$28,662.00				\$323,886.00										\$393,717.00
PROJECT TOTAL																	\$1,845,862.18

FIGURE 2
ESTIMATED COST OF THE PROJECT

CHAPTER 6

WORK, DATA, & COST MANAGEMENT PLAN

6.1 MANAGEMENT

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

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

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

6.2 SCHEDULE OF PROJECT MILESTONES

Submit Draft Work Plan	April 11, 1996
Receive Comments	April 21, 1996
Submit Final Work Plan	May 10, 1996
Receive NTP	May 23, 1996
Perform Site Preparation	May 28, 1996
Start OE Clearance	June 10, 1996
Site Shutdown for Corps Training & Christmas	December 17, 1996 - Jan 1, 1997
Home Leave	TBD
Complete OE Clearance	February 20, 1997
Submit Draft Final Report	March 28, 1997
Receive Comments	April 27, 1997
Submit Final Report	May 15, 1997

6.3 STAFFING/RESUMES [see Appendix H, HFA Resumes]

6.3.1 PROJECT MANAGER (PM)

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

6.3.2 SENIOR UXO SUPERVISOR (SUXOS)

6.3.2.1 Mr. David Frandsen is responsible for the day-to-day on-site management of UXO services. His responsibilities include coordination and direction of all UXO site operations.

6.3.3 SITE SAFETY OFFICER (SSO)

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

6.3.4 QUALITY CONTROL OFFICER(QC)

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

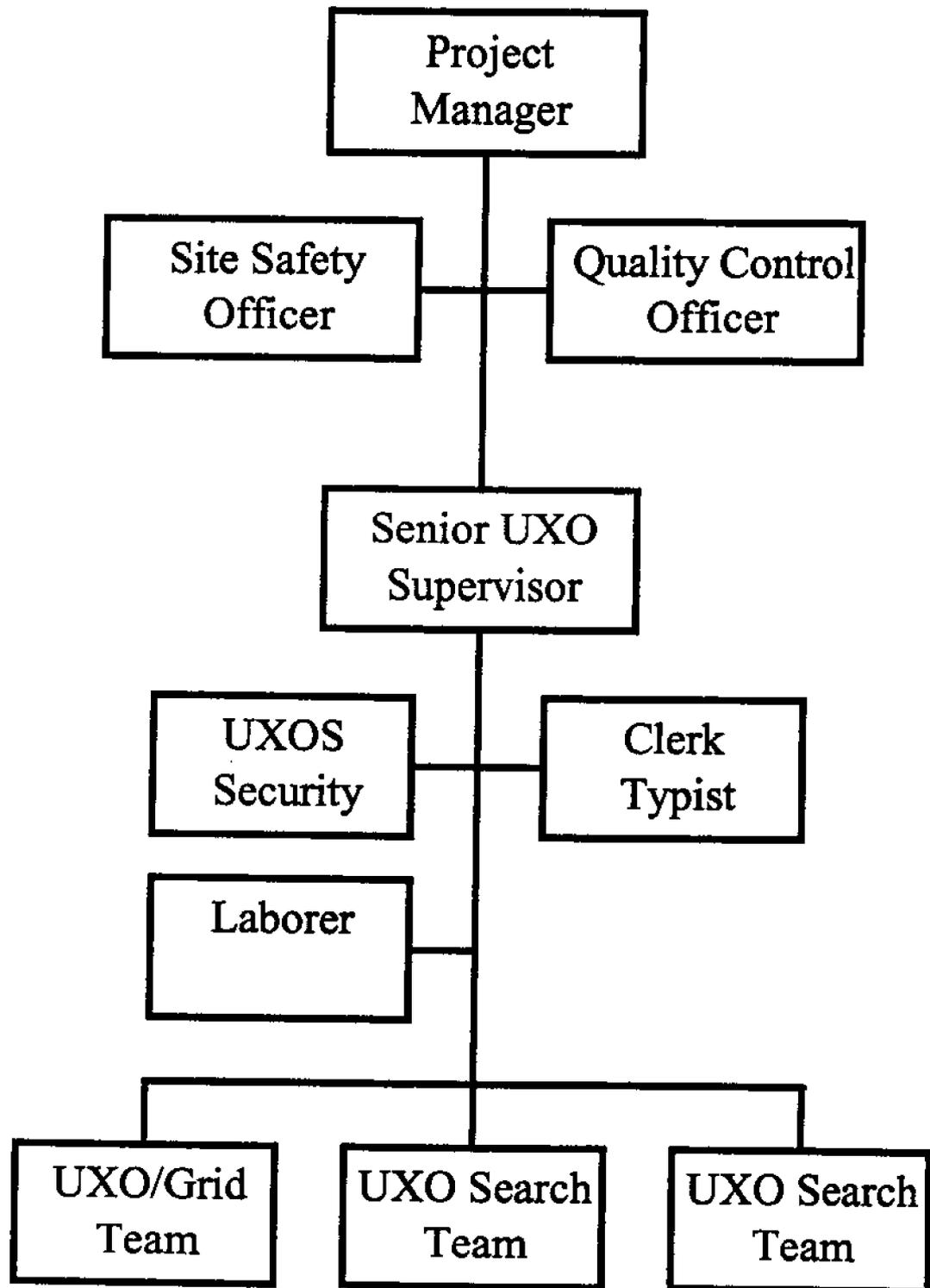
6.3.5 UXO SUPERVISOR

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

6.4 PERSONNEL REQUIREMENTS

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

FIGURE 3
ORGANIZATION CHART



CHAPTER 7

SURVEYING AND RECORDING

7.1 SURVEYING

7.1.1 HFA will perform all location surveys and mapping required to establish boundaries of areas specified in Paragraph 1.3 of the SOW and as required to support the project. During all field and intrusive activities, the survey crew will always be accompanied by a UXO specialist who will provide UXO safety and avoidance while surveyors are working. Grid corners shall be established using precision surveying methods.

7.1.2 Each corner of each grid area will be located by establishing the appropriate state plane grid system to the closest 1 foot and will be tabulated and shown on maps of the site. Other coordinate systems and accuracy specifications are not acceptable and will not be used. HFA will mark and survey the corners of the designated grids with stakes or other visible temporary markers. At least two monuments or reference points will be set or recovered in the area of each OOU being cleared. The grid system will be tied to these control points in the surveying and mapping requirements for each OOU.

7.1.3 Individual locations of recovered UXOs will be tape measured or the "x" and "y" distance estimated to obtain a horizontal accuracy of plus or minus one foot from the established grid corners. If subsurface UXOs are encountered, their depth below ground surface will be measured.

7.1.4 The location of ordnance scrap, ordnance fragments, shrapnel, small arms ammunition and metallic debris will be recorded only on a "per-grid" basis and not located by coordinates. The use of Total Station, GPS or other precision survey methods to locate individual UXOs, UXO scrap, or geophysical anomalies within a grid shall not be performed. A magnetometer shall be used to survey the location for the establishment of any monuments or markers.

7.1.5 Planimetric maps and digital orthophotography for the areas required for this SOW were provided by CEHNC-ED-CS-D. These base files shall be used, and referenced, in the development of detail grid files for preliminary and final submittal.

7.1.6 A licensed surveyor will be used for this task and he will install temporary monuments and boundary markers to control and document areas to be cleared.

7.1.7 The survey will be conducted in accordance with NAD 83.

7.1.8 The surveyor will prepare a planimetric map and provide digital data on 3.5 inch floppy disks, as outlined in the Scope of Work and Basic Contract.

7.2 TEAM ORGANIZATION

7.2.1 The UXO/Grid Team will be made up of one UXOS and four UXO Specialists. The team may be subdivided into two, two man teams, each equipped the necessary materials for laying out sample grids. Teams may be equipped with a GPS receiver if necessary for general mapping and plotting of area boundaries, horse trails, wetlands, etc.

7.2.2 The team will be responsible for:

7.2.2.1 locating and establishing grids;

7.2.2.2 marking and identifying each grid;

7.2.2.3 coordinating, and processing data.

7.2.3 The UXO/Grid Team will also serve to support additional requirements, such as the licensed land surveyor or function as a UXO sweep

7.3 MARKING SIGNIFICANT ANOMALIES/POINTS

7.3.1 Each grid will be investigated using a Schonstedt Magnetometer. All significant contacts in each grid will be plotted and recorded by the UXOS. Each day's data will be processed by the UXO mapping and data supervisor and included in the site's data base.

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

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

7.3.4 Significant anomalies/points are defined as:

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

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

7.3.4.3 all excavation where heavy equipment was used; and

7.3.4.4 the points where in-place detonations occurred.

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

7.3.6 DAILY RECORDING REQUIREMENTS

7.3.6.1 Each UXOS will provide to the QC a detailed accounting of all ordnance, ammunition, and explosive item/component/scrap encountered. This accounting will include the quantity, type, depth, condition, and final disposition of all items located in each grid. The depth of UXO located in areas designated for surface only clearance will not be recorded because all UXO will be on the surface.

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

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

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

CHAPTER 8

ENVIRONMENTAL PLAN

8.1 OVERVIEW

8.1.1 GENERAL DESCRIPTION OF THE AREA

8.1.1.1 Croft State Park consists of 7,088 acres located southeast and almost adjacent to the City of Spartanburg, South Carolina. The habitat that would be affected by the project consists primarily of three plant communities. These communities, in order of abundance, are old-field pines, mixed pine and hardwoods, and upland hardwoods. Four of the sites typically consist of maturing stands of pines and oaks with holly, cedar, dogwoods, sweetgum, and poplar as lesser components. Area OOU1B is a mature stand of pine, oak, maple, poplar, & sweetgum with holly, birch, dogwood, & cedar as lesser components.

8.1.1.2 Lake Craig and Lake Johnson are located in the center of the park. Lake Craig supports an active fishery. There are approximately 139 species of birds located on the site: 40 permanent, 47 summer, 31 winter, and 21 migratory residents. HFA will avoid disturbing the wildlife and coordinate with Croft State Park Environmental personnel for assistance as needed.

8.1.1.3 Croft State Park is generally underlain by Paleozoic age, crystalline rocks. The rocks are located in two distinct regions: The Inner Piedmont Belt and the Kings Mountain Belt. Belts trend northeast-southwest and bisect the park so that the western portion of the park is located in the Inner Piedmont Belt and the eastern portion in the Kings Mountain Belt.

8.1.2 WATER QUALITY

8.1.2.1 Fairforest and Kelsey Creeks are located on park property and run in close proximity (but not directly adjacent) to several of the specific sites to be cleared. Both creeks are classified by the South Carolina Department of Health and Environmental Control as FW (freshwater creeks). Freshwaters are suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. It is suitable for fishing and the survival and propagation of balanced indigenous aquatic community of fauna and flora. It is also suitable for industrial and agricultural uses.

8.1.3 HAZARDOUS AND TOXIC WASTE

8.1.3.1 Based on site inspections by Corps' personnel and historical knowledge of the site, hazardous or toxic wastes are not expected to be encountered in the five areas scheduled for clearing

8.1.4 THREATENED AND ENDANGERED SPECIES

8.1.4.1 The U.S. Fish and Wildlife Service provided a list of threatened (T) and endangered (E) species (13 February 1996) known to occur in Spartanburg County, South Carolina.

8.1.4.2 Spartanburg County

Species	Status	Presence
Dwarf-flowered heartleaf (<i>Hexastylis naniflora</i>)	T	Known
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SC	Possible
Georgia aster (<i>Aster georgianus</i>)	SC	Possible
Butternut (<i>Juglans cinerea</i>)	SC	Known

E Endangered

T Threatened

SC Service has limited evidence to support listing these species

8.1.5 CULTURAL RESOURCES

8.1.5.1 Various cultural resources sites have been located throughout the old Camp Croft property limits. These sites and other anomalies have been identified in the Croft State Park Management Plan and can be found on Figure I of that report. Archeological resources primarily consist of home sites within the park boundary.

8.2 PROBABLE IMPACT OF THE PROPOSED ACTION

8.2.1 LAND DISRUPTION

8.2.1.1 Land clearing will be restricted to minor clearing of areas needed to enable personnel to excavate to a point where they can determine the cause of the magnetometer signals. Minor additional clearing may occur in order to remove any ordnance or fragments of ordnance located during the excavation. If it is determined that ordnance should be detonated in place, there would be additional soil disturbed. Measures will be taken to minimize environmental disturbance during on-site detonation and all access/excavation/detonation holes shall be backfilled to grade and reseeded with indigenous grass after the ordnance is removed. If an excavation is required in an area of endangered/protected plant or animal, excavation shall proceed only after approval by the Croft State Park Environmental Personnel.

8.2.2 NOISE

8.2.2.1 There will not be a noticeable increase in the ambient noise levels when ordnance is found and is detonated in place. These increased noise levels will be temporary and short in duration. Personal impacts are not anticipated.

8.2.3 WATER QUALITY

8.2.3.1 There should be no degradation to the water quality in the area.

8.2.4 AIR QUALITY

8.2.4.1 Detonation of ordnance located on the surface will temporarily decrease the air quality in the immediate vicinity of the explosion.

8.2.5 FLORA

8.2.5.1 Some vegetation will be removed from the site during clearing of ordnance fragments & demolition of live ordnance. Clearing will occur only to the extent necessary to access the ordnance and properly dispose of it.

8.2.6 WILDLIFE

8.2.6.1 Wildlife surveys have been conducted at the sites as part of the Croft State Park Management Plan. Wildlife may be displaced temporarily due to noise from detonations.

8.2.6.2 Fishery resources at the park will not be affected.

8.2.7 THREATENED AND ENDANGERED SPECIES

8.2.7.1 Ordnance clearance in the clearing of the five areas should not damage any threatened or endangered species. If threatened or endangered plants or animals are encountered during the removal/demolition of ordnance, they will be, if possible, relocated.

8.2.8 CULTURAL RESOURCES

8.2.8.1 The five areas scheduled for ordnance removal have been previously sampled for cultural resources; and those cultural resource sites have been cataloged and mapped in the Croft State Park Management Plan for future research. If any of these resources (or newly discovered resources) appear to be threatened by the clearance activities, a decision will be made, in cooperation with the SHPO, as to the significance of the resources and what course of action will be required to preserve and/or study them.

8.3 SITE CONDITION SURVEY

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

the survey of the site. Specific items of interest are as follows.

8.3.2 TREES

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

8.3.3 SHRUBS AND GRASSED AREAS

8.3.3.1 The physical condition of shrubs and grassed areas, to include existing damage, will be noted. As noted during the Site Visit, a large portion of the site has been cultivated and is devoid of vegetation. HFA's activities do not normally disrupt the vegetation because excavations are small and the turf is normally replaced immediately after the contact is removed. HFA will procure indigenous seed mixtures from a local vendor and re-seed areas as needed.

8.3.4 ON-SITE AND IMMEDIATE OFF-SITE DRAINAGE

8.3.4.1 Existing drainage patterns will be noted, especially areas undergoing active erosion/sedimentation.

8.3.5 ACCESS ROADS AND HAUL ROUTES

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

8.3.6 DRAIN CULVERTS

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

8.3.7 FENCING

8.3.7.1 Damaged or missing sections of fencing will be noted.

8.3.8 PRE-EXISTING REFUSE/DEBRIS ACCUMULATIONS

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

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

8.4 ENVIRONMENTAL PROTECTION

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

8.4.2 PROTECTION OF LANDSCAPING

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

8.4.2.1.1 No trees, shrubs, turf, or crops will be removed, cut, or disturbed, unless specifically designated for clearing on the plans, or special authority is given by the CO or COR.

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

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

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

8.4.2.1.5 Appropriate measures will be taken during excavation of UXO to prevent root damage to trees that are to remain alive.

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

8.4.2.1.7 Collection of the miscellaneous metallic debris and non-hazardous UXO components will be consolidated in predetermined holding areas awaiting turn-in to DRMO.

8.4.3 PROTECTION OF WATER RESOURCES

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

8.5 CONTAMINATION CONTROL MEASURES

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

8.5.2 WASTE DISPOSAL

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

8.5.3 DUST CONTROL

8.5.3.1 HFA's UXO services will not normally generate any significant amounts of dust that require dust control measures. If dust is generated and it becomes a problem or nuisance, HFA will dampen the areas of concern using a water spraying tanker truck.

8.5.4 SPILL CONTROL

8.5.4.1 To minimize the possibility of spilling any potentially hazardous unknown liquid, HFA personnel will not open, move, or otherwise handle any drums or containers. To control possible spills of liquids such as gasoline or other petroleum used in the course of the work day, HFA will store such materials in suitable approved containers and when dispensing them personnel will do so on a leak proof surface such as a plastic or metal lined tray whenever possible. If spills do occur when refueling equipment, they will be immediately cleaned up and the materials contained. If a spill resulting from a ruptured UXO or some other type of container filled with chemical agents or HTRW should occur, HFA and all other personnel on-site shall evacuate in an upwind direction.

8.6 POST-UXO OPERATIONS CLEANUP

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

8.6.2 SITE WALKOVER

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

CHAPTER 9

QUALITY CONTROL

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

9.2 EQUIPMENT

9.2.1 All equipment will be inspected by the SUXOS and/or the QC officer prior to placing it in service to ensure it meets the standards of the equipment ordered.

9.2.2 EMERGENCY EQUIPMENT

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

9.2.3 MAGNETOMETERS

9.2.3.1 Magnetometers will be field tested daily to ensure they are operating properly. This will be accomplished by planting a 3" Stokes mortar or similar magnetic inert item to a depth of four feet and determining the standard indication. If a magnetometer does not meet the standard during the daily check, it will be returned to the manufacture for calibration, repair or replacement.

9.2.4 HAND TOOLS

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

9.2.5 SITE SPECIFIC ITEMS

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

9.2.6 OPERATIONAL CHECKS

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

9.3 RECORDS AND RECORD KEEPING

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

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

9.4 QUALITY CONTROL SITE CHECKS

9.4.1 Quality control site checks will be performed of the areas and grids completed. The QC officer will perform a visual inspection of 10 % of each grid site 1 where the surface removal was performed. Magnetometer sweeps will be performed over 10% of each grid in areas where a sub surface removal was performed. If a UXO or more than 5 anomalies are located in any grid, it will cause the entire grid to be re swept to insure it is free of UXO/anomalies. Grid markers will not be removed until the grids have received a satisfactory QA check by the CEHNC Site Safety Specialist.

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

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

9.4.4 No grid stakes will be removed until after the QA check and authorized by the QC officer.

9.5 DAILY QUALITY CONTROL REPORTS

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

CHAPTER 10 COMMUNICATIONS

10.1 HANDHELD RADIOS

10.1.1 Handheld radios will be used to maintain communications between the command site and all field units. All personnel will be familiar with radio operation and communication procedures. Radio checks will be made prior to departure from the command site to establish positive communications. Periodic check-ins with the command site are required.

10.1.2 Handheld radios will be tuned to the Croft State Park repeater station frequencies.

10.2 TELEPHONES

10.2.1 Telephone communications will be available from the command site to all emergency agencies. Mobile cellular telephones will be available for back-up communications and field use when needed.

CHAPTER 11

PROPERTY MANAGEMENT PLAN

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

11.2 GENERAL

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

11.3 RESPONSIBILITIES

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

11.3.2 SUPERVISOR RESPONSIBILITY

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

11.3.3 DIRECT RESPONSIBILITY

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

11.3.4 PERSONAL RESPONSIBILITY

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

11.4 PROPERTY CATEGORIES

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

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

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

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

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

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

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

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

11.5 ACCOUNTABILITY

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

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

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

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

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

11.6 MARKING OF EQUIPMENT

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

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

11.7 PETTY CASH LOGS/SPREADSHEET

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

11.8 MASTER CARD LOG

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

11.9 MAINTENANCE

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

11.10 STORAGE

11.10.1 The Croft State Park officials have agreed to provide a building for HFA's use as an office and storage area, and magazines to store explosives and demolition materials.

These are the same facilities used during previous EECAs and TCRA operations. All equipment other than consumable personal gear (rain suits, etc.) will be stored in these buildings during non working hours. Two office trailers will be leased and set up in the same location, utilities drops were installed during previous operations and are available for site use.

11.11 DISPOSITION

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

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

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

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

11.12.1 VEHICLES

Pathfinder/Blazer Type Vehicles	6 ea
F150 Type Pickup Trucks w/Bed Liner	1 ea
All Terrain Vehicles (ATV)	2 ea

11.12.2 HEAVY EQUIPMENT

Backhoe (Case 580 or equivalent)/w/ Trailer(if needed)	1 ea 1 ea
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11.12.3	HFA EQUIPMENT	
	Sokkia Spectrum GPS System w/Two Rovers Systems and 1 Base Station (if required)	1 ea
11.12.4	NON-EXPENDABLE GOVERNMENT FIELD EQUIPMENT	
	Schonstedt GA52 CX	18 ea
	MT or HT 1000 Radios w/Chargers	7 ea
	WBGW Meter	1 ea
	Cellular Telephones	2 ea
	Total Station w/Tripod, Prism, Prism Pole, & Battery Charger	1 ea
	15 Minute Eyewash Station	1 ea
	Large First Aid Kit	1 ea
	Portable Stretcher	1 ea
	Portable Oxygen Unit	1 ea
	VHS Video Camera	1 ea
	35mm Zoom Lens Camera	1 ea
	300' Fiberglass Survey Tapes	3 ea
	Hand held Compasses	4 ea
	Redi-Rite Sheet Holders	8 ea
	5 gal Water Jugs	3 ea
	Tool Kits w/Hand Tools	3 ea
	Long Handled Shovels	17 ea
	Loppers	6 ea
	Single Edge Axes	6 ea
	Pick Mattocks	6 ea
	Sledgehammers	2 ea
	Machetes	6 ea
	Blasting Cap Crimpers	4 ea
	Hose Reel For Firing Wire	2 ea
	Galvanometer	2 ea
	Blasting Machine	2 ea
	Weed Eaters	2 ea
	1 gal OSHA Gas Cans for Weed Eaters	2 ea
	Rubbermaid Team Boxes	6 ea
	Shin Guards for Weedeaters	2 pr
	Eyewash Station	1 ea
	Kevlar Chaps	6 ea
11.12.5	NON-EXPENDABLE OFFICE EQUIPMENT	
	Desktop Computer, 486DX2 66MHz, 500 MB HD, Double Speed CD ROM, Fax Modem w/Lotus 123 and Word Perfect for Windows installed	1 ea

Monitor(for use with Laptop computer already onsite)	1 ea
Copier	1 ea
Laser Printer	1 ea
Fax Machine	1 ea
Surge Suppressors	4 ea
3 Hole Punch	1 ea
2 Hole Punch	1 ea
Stapler	2 ea
Tape Dispenser	2 ea

11.12.6 CONSUMABLE GOVERNMENT PROPERTY

36" Wood Survey Stakes	2,500 ea
Red Plastic Survey Flags	2,000 ea
Yellow Plastic Survey Flags	1,000 ea
Red Flagging Tape	25 rolls
Vertical Wood Survey Stake Bags	3 ea
Survey Flag Carry Bags	6 ea
1/4" Poly Line	3,000 ft
Electrical Cord Reels	25 ea
Field Books	12 ea
Duct Tape	A/R
Monofilament Tape	A/R
Electrical Tape	A/R
Caution Tape	12 rolls
"AA" or "C" or 9 volt Batteries	A/R
Fluorescent Orange Marking Paint	A/R
White Marking Paint	A/R
Large First Aid Kit	1 ea
Small First Aid Kits	3 ea
Burn Kits	3 ea
Eyewash Kits	3 ea
1a 10bc Fire Extinguisher	6 ea
20lb abc Fire Extinguisher	2 ea
Vehicle Explosive Placards	4 ea
35mm Film	A/R
VHS HQ Videotape	2 ea
20' x 100' 6 mil Plastic Sheeting	1 roll
5 gal Plastic Buckets	15 ea
Sand Bags	500 ea
Sand	A/R
Plastic Trash Bags	A/R
Leather Work Gloves	50 pairs
Rain suits	19 ea
Disposable CPR Masks	A/R
Tick Repellant	6 ea

Electronic Thermometers w/Disposable Sheaths	6 ea
Air horns w/Compressed Air	2 ea
Signs (Warning, Blasting Operations, 3 types)	6 ea
Nitrile Inner Gloves	3 boxes
Earplugs	1 box
Electric Firing Wire	4,000 feet
Jet Perforators	120
80 grain Detonating Cord	1,000 feet
Electric Blasting Caps	100 ea
Detonating Cord Clips	50 ea
Copy Paper	A/R
Fax Paper	A/R
Pens, Pencils, Markers, etc.	A/R
Envelopes	A/R
Electric Pencil Sharpener	1 ea
Yellow Legal Pads	A/R
1/4" Grid Pads	A/R
3 Ring Binders	A/R
Hanging File Folders	A/R
Waste Baskets	2 ea
Trash Barrels	2 ea
Petty Cash Log	1 ea
Staples	A/R
Scotch Tape	A/R
Misc. Clips, Tacks, etc.	A/R
Staple Remover	1 ea
Paper Towels	A/R
Paper Cups	A/R
Electronics Cleaner	A/R
Field Books	10

CHAPTER 12

GENERAL SITE REQUIREMENTS

12.1 SAFETY TRAINING

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

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

12.1.3 PROJECT SCOPE

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

12.1.4 MEDICAL

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

12.1.5 EMERGENCY PROCEDURES

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

12.1.6 DEFINITION OF WORK SITE

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

12.1.7 PROJECT COMMUNICATION

12.1.7.1 Communication instructions will include radio familiarization and procedures.

12.1.8 ACCIDENT REPORTING

12.1.8.1 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.

12.1.9 UXO PERSONNEL

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

12.1.10 SAFETY MEETINGS

12.1.10.1 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].

12.1.11 NON-UXO PERSONNEL

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

12.1.12 UXO SAFETY TRAINING AND OTHER SITE HAZARDS

12.1.12.1 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 provided by Croft State Park. 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 which have been positively cleared.

12.6 PHYSICAL QUALIFICATIONS

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

12.7 DRUG/ALCOHOL ABUSE PREVENTION

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

12.8 PERSONAL PROTECTIVE EQUIPMENT

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

12.9 PROJECT EQUIPMENT

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

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

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

12.10 NON-PERSONNEL ACCIDENTS

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

12.11 FIRE

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

12.12 SAFETY INSPECTION SCHEDULE

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

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

12.13 ACCIDENT INVESTIGATION/REPORTS

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

- 12.13.1.1 A sequence will be established of events leading to the accident.
- 12.13.1.2 The accident scene and all involved property will be observed. Sketches or photographs will be used, if necessary, to clearly present the sequence of events and possible contributing factors.
- 12.13.1.3 The cause of the accident or contributing factors will be identified, if possible.
- 12.13.1.4 Interviews will be conducted of people involved and witnesses. Each witness and those involved will be identified.
- 12.13.1.5 The accident scene will be photographed as soon as possible.
- 12.13.1.6 The collected information will be analyzed and a corrective action/plan will be developed to eliminate future accidents, if possible.
- 12.13.1.7 Copies of the accident report will be provided to the CEHNC Safety Specialist and CEHNC.
- 12.13.1.8 All accidents which occur incident to the project will be investigated, reported, and analyzed as prescribed in paragraph 01.D of EM 385-1-1.
- 12.13.1.9 Accidents of any nature will be immediately reported to the PM and/or SUXOS and HFA's Health and Safety Manager.

12.14 FORMS

12.14.1 Appendix F 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

APPENDIX A

SCOPE OF WORK

**STATEMENT OF WORK
ORDNANCE REMOVAL ACTION
FORMER CAMP CROFT
SPARTANBURG, SOUTH CAROLINA**

19 April 1996

1.0 BACKGROUND AND GENERAL STATEMENT OF WORK: The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS). Ordnance and explosives (OE) exists on property formerly owned by the Department of the Army.

1.1 Explosive ordnance is a safety hazard and constitutes an imminent and substantial endangerment to site personnel and the local populace. During this removal action, it is the Government's intent that the contractor destroy, by detonation, on-site, all Unexploded Ordnance (UXO) encountered. This action will be performed in substantial compliance with the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA), Section 104 and the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required.

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

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

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

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

1.3 GENERAL DESCRIPTION: The former Camp Croft Training Facility was approximately 19,044.46 acres and was approximately 5 miles southeast of Spartanburg, South Carolina. Current land usage is approximately 7,088.08 acres for Camp Croft State Park, 4,936.24 acres for farming, 256 acres for private industry, and 6,764.14 acres of residential used to include a public golf course. This SOW pertains to Ordnance Operable Units (OOU) 1B and 7, OOU 2 and 3 as identified by the Engineering Evaluation/Cost Analysis (EE/CA), Former Camp Croft, January 1996 and Area A39 as identified by the Supplemental Archives Report.

1.3.1 Ordnance Operable Unit-1B. OOU-1B is approximately 65 acres located in the center of the park and used for surface recreation. During the EE/CA 60mm and 81mm mortars were

found in this area. This area is to be surface cleared with the exception of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 3,000 feet long.

1.3.2 Ordnance Operable Unit-7. OOU-7 is approximately 170 acres located in the vicinity of Camp Croft State Park office and campgrounds and is the Park's busiest area. OOU-7 shall be subsurface cleared to two feet. During the Time Critical Removal Action (TCRA) and the EE/CA performed on OOU-7, 60mm, 81mm mortars, 2.36 inch rocket parts and small arms were found.

1.3.3 Ordnance Operable Unit 2. OOU-2 is a 325 acre area located on the east side of the park, approximately 0.7 mile from State Highway 295. Activities performed in OOU-2 are generally limited to recreational surface use which includes hiking and horseback riding. During the EE/CA performed on OOU-2, 60mm, 81mm mortars, 4.2 inch mortar parts and small arms were found. OOU-2 shall be surface cleared only with the exception of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 5,700 feet long.

1.3.4 Ordnance Operable Unit-3. OOU-3 is located on private residential property. A MkII hand grenade, practice grenades and grenade parts and fragmentation were found during the EE/CA. This area is approximately 11 acres and shall be cleared to a depth of two feet.

1.3.5 Area 39. This area was identified in the Supplemental Archive Search Report as a potential OE area. This area shall consist of clearance of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 6,375 feet long.

1.3.6 Other ordnance items found on Camp Croft during the TCRA and EE/CA include 37mm, 57mm, 105mm and 155mm artillery projectiles and hand grenades.

1.3.7 The site's proximity to public roads and inhabited areas may create a physical security situation during demolition operations that shall be addressed in the work plan.

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

2.0 **OBJECTIVE:** Safely locate, identify, and dispose of all surface OE and OE scrap described in Task 4. Safely locate, identify, and dispose of all subsurface OE and OE scrap to a depth of 2 feet described in Task 4.

3.0 DESCRIPTION OF SERVICES:

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

3.1.1 PERFORM SITE VISIT: This task shall be accomplished IAW Section C, paragraph 3.2, of the Basic Contract. Prior to preparation of the WP, a site visit, not to exceed 5 days including travel time, is authorized. The site visit team shall not exceed two persons, one of whom shall be a Senior UXO Supervisor. The contractor shall be prepared to make the site visit within 5 days of award of the Delivery Order and shall notify the USAESCH Project Manager (Ms. Patricia Berry) of the proposed dates. The site visit shall include coordination with the appropriate agencies to include local medical facilities, and local airfield/port. During the site visit, environmental concerns and endangered species in the ordnance removal areas shall be addressed. The contractor shall prepare an abbreviated site safety and health plan prior to the site visit. This plan shall be submitted to the USAESCH Safety Office for approval.

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

3.1.3 DISPOSAL ALTERNATIVES: Based on the site visit, the contractor shall describe feasible alternatives for disposal and recommend the safest and most cost-effective method of treatment and disposal of OE. If "blown in place" is the only method of disposal recommended by the contractor, a feasibility letter is not required. If other than the "blown in place" alternative is recommended, the contractor shall provide disposal alternatives IAW Section C, paragraph 3.3, of the Basic Contract. The method of treatment shall be selected and approved by the contracting officer after which the contractor shall proceed with preparation of the WP.

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

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

3.1.4.2 UXO Operational Plan.

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

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

3.1.4.4 Location Survey and Mapping Plan.

3.1.4.5 Environmental Protection Plan.

3.1.4.6 Quality Control Plan.

3.1.4.7 Work, Data, and Cost Management Plan.

3.1.4.8 Technical and Management Plan

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

3.1.5.1 Site location and description.

3.1.5.2 Projected removal action starting date.

3.1.5.3 Suspected items.

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

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

3.1.5.6 Name of UXO contractor.

3.1.5.7 An on-site detailed disposal plan.

3.1.5.8 A drawing of the site.

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

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

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

3.1.5.12 Identify the basic contract and the delivery order.

3.1.6 Other subplans identified in the Basic Contract are not required for this delivery order.

3.2 (TASK 2) COMMUNITY RELATIONS

3.2.1 The contractor shall assist in the conduct of public meetings and media days, as required, to inform the public of the purpose of the project, the procedures to be followed, and the cooperation requested.

3.2.2 All press releases and media appearances shall be coordinated with, and approved by, the PAO, U.S. Army Corps of Engineer District, Charleston.

3.3 (TASK 3) LOCATION SURVEYING AND MAPPING

3.3.1 Surveying. The Contractor shall perform all location surveys and mapping required to establish boundaries of areas specified in Paragraph 1.3 and as required to support the project. During all field and intrusive activities, the survey crew shall be accompanied by a UXO specialist who shall perform a UXO survey in each area prior to the surveyors starting work. Based on site conditions it is possible that a UXO escort will not be required in all areas at all times after the initial site visit. However, such a decision will be made jointly by the on-site safety officer and the CEHNC Safety Specialist who may rescind or modify it at any time. Grid corners shall be established using precision surveying methods. Each corner of each grid area shall be located by establishing the appropriate state plane grid system to the closest 1 foot and shall be both tabulated and shown on maps of the site. Other coordinate systems and accuracy specifications are not acceptable and shall not be used. The Contractor shall mark and survey the corners of the designated grids with stakes or other visible temporary markers. Individual locations of recovered UXOs only shall be tape measured or the "x" and "y" distance estimated to obtain a horizontal accuracy of plus or minus one foot from the established grid corners. If subsurface UXO is encountered, their depth below ground surface shall also be measured. The location of ordnance scrap, ordnance fragments, shrapnel, small arms ammunition and metallic debris shall be recorded only on a "per-grid" basis and not located by coordinates. The use of Total Station, GPS or other precision survey methods to locate individual OE, OE scrap, or geophysical anomalies within a grid shall not be performed. A magnetometer shall be used to survey the location for the establishment of any monuments or markers.

3.3.2 Planimetric maps and digital orthophotography for the areas required for this SOW are available from CEHNC-ED-CS-D, in DGN and TIF format, upon request. These base files shall be used, and referenced, in the development of detail grid files for preliminary and final submittal.

3.3.3 Items and data to be submitted to CEHNC as part of the tasks are as follows:

3.3.3.1 A tabulated list of all control points adjusted coordinates established and/or used for this survey.

3.3.3.2 A tabulated list of the respective grid corners for all grids cleared will be required for all the areas listed in Par. 1.3.

3.3.3.3. An electronic and hard copy of all drawing files and reference files used for and developed as part of this removal action. These files shall meet the following requirements:

3.3.3.3.1. Each file shall have a standard metric A-1 size drawing which is 841 mm by 594 mm (33.1 inches by 23.4 inches). Each sheet shall also have a standard border, revision block, title block, complete index sheet layout, bar scale, legend, metric grid lines, grid tick layout, a magnetic north, a grid north, and a true north arrow, and be plotted at a horizontal scale of 1:2,000. Each file shall have a standard metric A-1 size drawing which is 841 mm by 594 mm (33.1 inches by 23.4 inches). Each sheet shall also have a standard border, revision block, title block, complete index sheet layout, bar scale, legend, metric grid lines, grid tick layout, a magnetic north, a grid north, and a true north arrow, and be plotted at a horizontal scale of 1:2,000.

3.3.3.3.2 No digital data will be accepted until proven compatible with the CEHNC Graphics System. All revisions required to obtain compatibility with the CEHNC Graphics System shall be done at the contractor's own expense.

3.3.3.3.3 The Government shall be provided with a copy of the design files on 8 mm 5.0, or 10.0 gigabyte magnetic tapes, 3 1/2" HD floppy disks, or approved CD ROM format. The CD ROMs are preferred. The data to be submitted shall contain the final, corrected version of the design file. The tapes or disks shall be labeled, showing the project name, project number, date, company name, address and telephone number, and the number of files.

3.4 (TASK 4) ORDNANCE AND EXPLOSIVES REMOVAL. This task shall be accomplished IAW Section C, paragraph 3.5, of the Basic Contract:

3.4.1 The contractor shall furnish all necessary personnel and equipment to perform a surface and/or subsurface clearance, as specified below, of all OE on the project site. This action shall also include all OE-related scrap and non OE-related metallic scrap greater than 1 square inch in size.

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

3.4.3 UXO encountered during this project shall be "blown in-place". Manual procedures for armed UXO shall not be utilized unless approved by the USAESCH Safety Specialist, who will have access to TM 60-series publications.

3.4.4 All OE operations shall comply with the U.S. Army Corps of Engineers, Huntsville Division, Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO). Only USAESCH approved UXO personnel shall perform UXO-related tasks.

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

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

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

3.4.7 The contractor shall provide all demolition materials unless otherwise directed by the Government. This shall be outlined in the WP.

3.4.8 During the subsurface operation the contractor shall use a magnetometer capable of detecting a 105mm projectile to a depth of 4 feet and a MKII to a depth of 2 feet. The contractor shall dig to a depth of two feet to determine the identity of the magnetic anomaly. The on-site USAESCH Safety Specialist may approve deeper excavation if he determines it necessary.

3.4.8.1 Magnetometers shall be field tested daily to ensure that they are operating properly. This shall be accomplished by planting an inert 105mm projectile or similar inert object to a depth of 4 feet and a MKII to a depth of 2 feet and determining the standard indication. If a magnetometer does not meet the standard during the daily check, it shall be calibrated, repaired, or replaced.

3.4.9 If an excavation is required in an area of endangered/protected plant or animal, excavation shall proceed only after approval by the Camp Croft State Park Environmental personnel.

3.4.10 Unless approved by the USAESCH Safety Specialist, all recovered OE and OE scrap shall be disposed of daily.

3.4.11 All access/excavation/detonation holes shall be backfilled to grade and reseeded/sodded

with indigenous grass as directed by the Contracting Officer.

3.4A (TASK 4A) PERFORM UNEXPLODED ORDNANCE REMOVAL IN OOU-7.

3.4A.1 In addition to requirements of paragraph 3.4 above the following shall be accomplished. OOU-7 shall be cleared subsurface cleared to a depth of two feet.

3.4B (TASK 4B) PERFORM UNEXPLODED ORDNANCE REMOVAL IN OOU-1B.

3.4B.1 In addition to requirements of paragraph 3.4 above the following shall be accomplished. Only the horse trails in OOU-1B shall be cleared to a depth of two feet to include 10 feet on either side of the trail. Other areas in OOU-1B shall be surface cleared only. The horse trails are approximately 3,000 feet long.

3.4C (TASK 4C) PERFORM UNEXPLODED ORDNANCE REMOVAL IN OOU-2.

3.4.C.1 In addition to requirements of paragraph 3.4 above the following shall be accomplished. OOU-2 shall be surface cleared only with the exception of the horse trails and 10 feet on either side of the trails which shall be cleared to a depth of two feet. The horse trails are approximately 5,700 feet long.

3.4D (TASK 4D) PERFORM UNEXPLODED ORDNANCE REMOVAL IN OOU-3.

3.4.D.1 In addition to requirements of paragraph 3.4 above the following shall be accomplished. OOU-3 shall be cleared to a depth of two feet.

3.4E (TASK 4E) PERFORM UNEXPLODED ORDNANCE REMOVAL IN AREA 39

3.4.E.1 In addition to requirements of paragraph 3.4 above the following shall be accomplished. The horse trails in Area 39 shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately 6,375 feet long. Other areas contained in Area 39 shall not be cleared.

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

3.5.1 The contractor shall furnish all necessary personnel and equipment to turn in all recovered inert UXO-related scrap and non UXO-related scrap metal greater than 1 square inch in size. The methodology to accomplish this task shall be proposed in the WP.

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

3.5.3 The contractor shall complete a DD Form 1348-1 and/or local form required by the nearest

Defense Reutilization Marketing Office (DRMO). The contractor shall prepare, and the Senior UXO Supervisor shall sign, a certificate as follows:

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

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

3.5.5 In the event that DRMO does not accept scrap or is not locally available, the contractor shall arrange for a local scrap contractor to remove the scrap. This shall be done at no cost to the government.

3.6 (TASK 6) PERFORM QUALITY CONTROL:

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

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

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

3.7.1 All original surveying and mapping data from Task 3.

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

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

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

3.7.5 QC documentation.

3.7.6 DRMO turn-in documentation.

3.7.7 A minimum of 20 4" X 6" color photographs shall be included in the report depicting major action items and UXO discoveries. The original, Final Report furnished to USAESCH shall include original photographic prints. Photographs contained in draft submissions and copies of

final submissions shall be color reproductions. Further, a minimum of 45 minutes of narrated video tape depicting all activities shall be provided in two copies to USAESCH.

3.7.8 A financial breakdown by area and by task of all costs and labor hours used to perform this SOW.

3.7.9 A written record of all plants and animals destroyed during the OE removal activities on site. The contractor shall include all restoration efforts performed as required in Task 4 of this SOW.

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

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

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

ADDRESSEE	COPIES
US Army Engineering and Support Center Huntsville ATTN: CEHNC-OE-DG (Ms. Carol A. Youkey) PO BOX 1600 Huntsville, Alabama 35807-4301	10
US Army Engineer District, Charleston ATTN: CESAC-PM-M (Wayne Bogan) PO BOX 919 Charleston, SC 29402-0919	8
US Army Engineer Division, South Atlantic ATTN: CESAD-PM-H (Ms. Sharon Ernst) 77 Forysth Street, SW Atlanta, GA 30335-6801	1

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

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4.1 Submittals and Due Dates:

SUBMITTAL	DUE DATE
Disposal Feasibility Letter	5 workdays after site visit
Draft Work Plan	21 calendar days after site visit
Final Work Plan	14 calendar days after receipt of comments
Draft Removal Report	30 calendar days after completion of field work
Final Removal Report	30 calendar days after receiving review comments

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

6.0 REFERENCES:

- 6.1 DOD Manual 4160.21.M, Defense Utilization and Disposal Manual.
- 6.2 AR 200-1, Environmental Protection and Enhancement.
- 6.3 AR 385-40 with USACE Supplement.
- 6.4 AR 386-63, Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat.
- 6.5 EM 385-1-1, CE Safety and Health Requirements Manual.
- 6.6 TM 9-1300-206, Ammunition and Explosive Standards.

6.7 CEHND Safety Concepts and Basic Considerations for UXO.

6.8 DoD 6055.9 Std. DoD Ammunition and Explosive Safety Standards

7.0 GOVERNMENT FURNISHED.

7.1 Former Camp Croft Archives Search Report and Supplemental Archives Search Report

7.2 Rights of Entry (CESAC)

7.3 UXO technical publications/information (USAESCH).

7.4 Available equipment (USAESCH)

7.5 Engineering Evaluation /Cost Analysis

7.6 Abbreviated Site Safety and Health Plan form

APPENDIX B

**SITE SPECIFIC SAFETY
AND HEALTH PLAN**

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



ORDNANCE REMOVAL ACTION

**FORMER CAMP CROFT
SITE-SPECIFIC SAFETY
& HEALTH PLAN**

CONTRACT NUMBER: DACA87-94-D-0019
DELIVERY ORDER: #012
CLIENT NAME: U.S. Army Corps of Engineers
PRIME CONTRACTOR: Human Factors Applications, Inc.
PROJECT TITLE: Ordnance Removal Action
PROJECT LOCATION: Former Camp Croft, South Carolina

Date Prepared: 5/10/94

Prepared By: Michael Winingham
Michael Winingham

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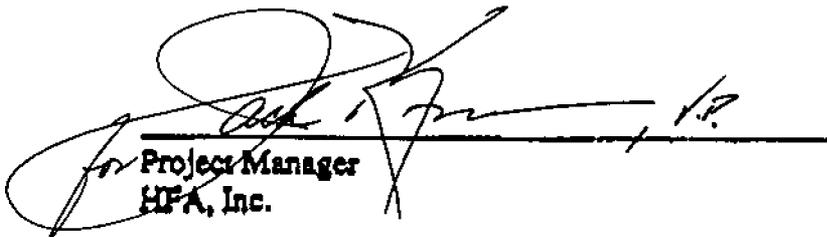
- Reporting Injuries and Illnesses 15-1
- USACE Accident Reporting 15-1
- Logs, Reports, and Recordkeeping 15-1

LIST OF ABBREVIATIONS AND ACRONYMS

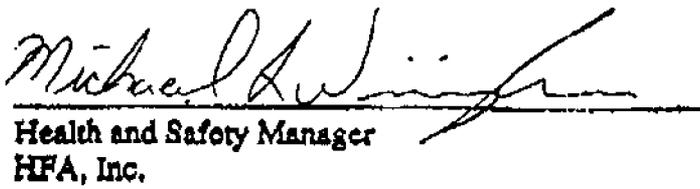
AGA	American Gas Association
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASME	American Society of Mechanical Engineers
ASR	Archives Search Report
BZ	Breathing Zone
CDH	Colorado Department of Health
CEHNC	U.S. Army Engineering & Support Center, Huntsville
CERCLA	Comprehensive 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
EZ	Exclusion Zone
F	Fahrenheit
GFCI	Ground Fault Circuit Interrupters
HAF	Hazard Analysis Form
HBV	Hepatitis B Vaccinations
HE	High Explosives
HEAT	High Explosive Anti-Tank
HFA	Human Factors Applications, Inc.
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In accordance with
IDLH	Immediately Dangerous to Life or Health
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
SwSHP	Site-wide Safety and Health Plan
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

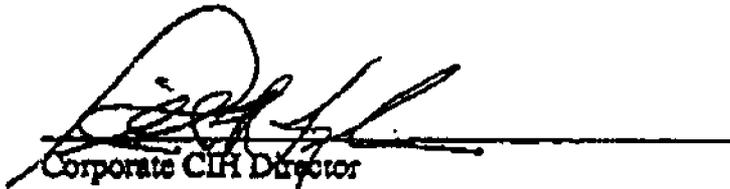
REVIEWS AND APPROVALS


Project Manager
HFA, Inc.

5/9/96
Date


Health and Safety Manager
HFA, Inc.

5/9/96
Date


Corporate CFI Director

5/8/96
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 Former Camp Croft, near the city of Spartanburg, South Carolina. All on-site personnel shall 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 shall 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 Former Camp Croft consists of approximately 19,000 acres and is located 5 miles southeast of Spartanburg, South Carolina. Former Camp Croft is divided into four parts: Training Range Impact Area, Gas Chambers and Gas Obstacle Course Area, Cantonment Area, and Grenade Court. The OE removal action will be limited to the Training Range Impact Area,

which is the present day Croft State Park. The project site is further broken down into Ordnance Operable Units (OOU), OOU-1B, OOU-2, OOU-3, OOU-7, and Area 39. The sites that are to be cleared for ordnance, ammunition, and explosives contamination are shown on the site map.

1.1.2.2 OOU-1B is approximately 65 acres located in the center of the park and used for surface recreation (hiking and horseback riding). The Lake Johnson/Fairforest Creek Connector Trail and Croft State Park Road both pass through OOU-1B. The area is almost exclusively wooded terrain with a few horse or hiking trails.

1.1.2.3 OOU-2 is a 325 acre area located on the east side of the park, approximately 0.7 miles from State Highway 295. Activities performed in OOU-2 are generally limited to recreational surface use, which includes horseback riding and hiking. Henningston Road passes through OOU-2. The area is mostly wooded terrain.

1.1.2.4 OOU-3 is located on a private residential area north of the park. This area is approximately 11 acres in size and within the former Camp Croft cantonment area. Due to this area being a private residential property, intrusive activities (e.g., children digging, planting, pool construction, installation of utilities lines) may be possible.

1.1.2.5 OOU-7 is approximately 170 acres located in the vicinity of the park office and includes campgrounds, picnic areas, hiking trails, horse show ring, and is the busiest area of the park.

1.1.2.6 Area 39 was identified in the ASR as a potential OE area. The survey team for the ASR noticed this area had considerable OE contamination (i.e., Trench Mortars, fin assemblies, links for 20mm cartridges, and fuzes). Activities performed in this area generally consist of horseback riding.

1.1.3 PHYSICAL CHARACTERISTICS OF THE SITES

1.1.3.1 Geology

1.1.3.1.1 Former Camp Croft is underlain by Paleozoic age metamorphic and igneous rock. Two distinct rock belts, the Inner Piedmont Belt and Kings Mountain Belt, lie within Spartanburg county and trend northeast to southwest, bisecting the park.

1.1.3.1.2 The Inner Piedmont Belt underlies the western portion of the park. It is comprised mainly of biotite and granitic gneisses, with several other types of igneous rock and igneous intrusions.

1.1.3.1.3 The Kings Mountain Belt underlies the eastern portion of the park and is comprised of pegmatite and diabase dikes. The pegmatite dikes lie in the northeast portion of the park, and the diabase dikes lie in the southeast-central portion of the park.

1.1.3.2 Soils

1.1.3.2.1 Native soils within the Former Camp Croft sites are saprolitic. Saprolite is formed from rock that has been subjected to chemical weathering. Overlying layers of weathered residual bedrock known as saprolite (red clay) range from a few feet thick to more than 100 feet thick. Most of the soils are eroded, and land is gullied as a result of previous land uses.

1.1.3.3 Water Sources

1.1.3.3.1 Two major surface water features, Lake Johnson and Lake Craig, lie in Croft State Park and were formed by the construction of a dam in 1951. Lake Craig, the larger lake, covers approximately 150 acres and lies in the south-central portion of the park. Lake Johnson covers approximately 75 acres and lies just north of Lake Craig. Fairforest Creek runs along the southern boundary of the park.

1.1.3.4 Weather

1.1.3.4.1 The climate in the Former Camp Croft Area is considered temperate and rainfall is well-distributed throughout the year. The prevailing winds are from the southwest, but blow from the northeast in late summer and early fall. Average wind velocity is about 8 miles per hour. The average annual relative humidity is approximately 70 percent. Rainfall ranges from 1/10-inch (approximately 76 days per year) to 1 inch (approximately 14 days per year). Warm weather generally lasts from May into September, with a few breaks in the heat during midsummer. Winters are mild and relatively short, with approximately 60 days at freezing temperatures or below.

1.1.4 PAST USES OF SITES OOU-1B, OOU-2, OOU-3, OOU-7 AND AREA 39

1.1.4.1 OOU-1 is a suspected impact range for 60mm and 81mm mortars, and small arms training.

1.1.4.2 OOU-2 is a suspected impact range for 60mm, 81mm, and 4.2" mortars, and small arms training.

1.1.4.3 OOU-3 is a suspected practice range for MKII hand grenades.

1.1.4.4 OOU-7 is a suspected impact range for 60mm and 81mm mortars, small arms training, and hand grenade practices.

1.2 EVALUATION OF CONTAMINATION

1.2.1 Conventional ordnance training was conducted on Former Camp Croft during WWII. The types of munitions suspected and/or confirmed used at the Former Camp Croft are as follows; small arms (.22-Cal, .30-Cal, .45-Cal, and .50 -Cal), 22mm HE projectiles, grenades (MKII HE & Practice, offensive, WP smoke rifle, and colored smoke rifle), mortars (60mm & 81mm HE, practice, 4.2" mortars, WP smoke, and illuminating), and rockets (2.36" Heat & practice).

1.2.2 The following contamination evidence has been confirmed during OE sampling for the following sites:

1.2.2.1 OOU-1 - 60mm HE mortars (12), 81mm HE mortars (1), and .30 caliber small arms.

1.2.2.2 OOU-2 - 60mm HE mortars (19), 81mm HE mortars (1), and .30 caliber small arms.

1.2.2.3 OOU-3 - MKII HE hand grenade (1), MKII practice grenade (4), and .30 caliber small arms.

1.2.2.4 OOU-7 - 60mm HE mortars (26), 81mm HE mortars (1), hand grenades parts, and .30 caliber small arms.

1.2.2.5 Area 39 - suspected 60mm mortars, 20mm projectiles, unknown fuzes, and small arms.

1.3 FRAGMENTATION DISTANCE/MCE

1.3.1 OOU-1B - The fragmentation distance for OOU-1B is based on a 81mm HE mortar. The fragmentation distance is 800 feet (60A-1-1-4) and pertains to the whole site.

1.3.2 OOU-2 - The fragmentation distance for OOU-2 is based on a 4.2" HE mortar. The fragmentation distance is 955 feet (60A-1-1-4) and pertains to the whole site.

1.3.3 OOU-3 - The fragmentation distance for OOU-3 is based on a MKII HE hand grenade. The fragmentation distance is 150 feet (ETL 385-1-1), the safe separation between UXO teams, and pertains to the whole site.

1.3.4 Protection of personnel and property are critical elements of any removal operations performed at this site. Engineering controls will be employed during any intrusive activities and/or demolition operations to protect nearby structures and evacuation of residents will be the primary method of protecting people. The location of underground utilities will be determined before excavations or in place detonation occurs via contact the local utilities ("Miss Utility" @ 800-922-0983) in locating the buried utilities.

1.3.4.1 The aluminum shelters used at other HFA sites will satisfy the requirement for engineering controls during intrusive activities and tamping of the UXO that are to be detonated in place will be done with sand/earth cover for protection of property.

1.3.4.2 Due to the sensitive fuzes used in hand grenades, moving them is not a safe option. Therefore, if a situation arises where a UXO cannot be detonated in place, the CEHNC Safety Representative will be notified so he can contact the nearest EOD unit for support.

1.3.5 OOU-7 - The fragmentation distance for OOU-7 is based on a 81mm HE mortar. The fragmentation distance is 705 feet (60A-1-1-4) and pertains to the whole site.

1.3.6 Area 39 - The fragmentation distance for Area 39 is based on a 60mm HE mortar. The fragmentation distance is 560 feet (60A-1-1-4) and pertains to the whole site.

1.3.7 All non-UXO personnel will be evacuated to an area outside of the established fragmentation distance zones. This fragmentation distance only applies during intrusive activities.

1.4 POLICY STATEMENT

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.

1.4.2 We believe in two fundamental principles of safety: all accidents, injuries and occupational illnesses are preventable; and if an operation cannot be done safely, we will not do it. 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.

1.4.3 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.

1.4.4 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.

1.5 REFERENCES

1.5.1 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);
- South Carolina State Safety and Health Regulations, General South Carolina State Department of Labor and Industries Date);
- 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 chemical and task hazard information. The Hazard Analysis forms (See Chapter 15) reflect the hazards anticipated for these sites and the potential risk of personnel exposure. 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 for the safe conduct of any given task. The types of hazards which may be encountered during removal activities encompass a full spectrum: chemical, biological, and physical. Biological and physical hazards will likely be consistent from site to site with variations attributed to the degree of development at the site (e.g., the amount of vegetation at the site, whether the site is paved, 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 vigilant in identifying hazards in the site and bring them to the attention of supervisory personnel.

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 EE/CA 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 OOU-1B, OOU-2, OOU-3, OOU-7, and Area 39 located on Former Camp Croft. The purpose of this removal action is to safely perform a surface and subsurface clearance of the identified project sites. This will include the following tasks:

- Location Surveying and Mapping/Site Preparation;
- Ordnance, Ammunition, and Explosive Removal;
- Turn-in of Recovered Ordnance, Ammunition, and Explosive 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 hazards which may harm site personnel. At any time during site activities that 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 of 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 HFA will establish area boundaries, grids, and lanes on the site. These activities will include other site preparation (surveying and limited vegetation removal) 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 may be a concern during this and all other tasks associated with this project. Section 2.8.2 includes a thorough discussion on the signs and symptoms of heat stress.

2.5.3.2.2 Weed whackers present noise and vibration hazards and hot surfaces. Additionally, operation of weed whackers and manual clearing and grubbing may cause blisters, sore muscles, joint and skeletal injuries, contusion and lacerations hazards, and present eye hazards from flying particles.

2.5.3.2.3 When operations involve the use of weed whackers, all operators will be required to wear the proper protective equipment (i.e., leather gloves, hearing protection, hard hats, shin guards, and meshed face shields). When individuals are involved in manual brush clearing operations with a machete, they will be required to wear Level D PPE and chain saw chaps.

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 as stated in Section 2.10.

2.5.4 ORDNANCE, AMMUNITION, AND EXPLOSIVES REMOVAL ACTION

2.5.4.1 HFA will perform a surface and sub-surface clearance of ordnance, ammunition, and explosives; mapping; and disposal of all UXO within the designated search grids. This removal action shall include the removal and disposal of all ordnance, ammunition, and explosive-related and target-related scrap. This shall be accomplished using magnetometers and hand excavation. Limited vegetation removal will occur to ensure the safety of field personnel.

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 the 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. Handling procedures for preventing explosion of UXOs will be done by careful shovelling and removal, placement of items in proper transport containers, and maintaining positive control at all times.

2.5.4.2.2 Heavy equipment may be used to excavate anomalies deemed too large to dig by hand or to remove OE related scrap from within the sites. All heavy equipment operations will be in accordance with 29 CFR 1926.600 and HFA's Heavy Equipment SOP.

2.5.4.2.3 Excavations completed by hand will pose no confined space hazards. Excavations done with heavy equipment may pose a significant threat to employees if they are not carefully controlled. The removal of non-essential personnel from the immediate vicinity and use of a safety observer to assist heavy equipment operators to navigate around the site is required. Excavations may collapse if they are not dug properly or shored/sloped as required. Therefore, all sloping of the excavations will be done in accordance with 29 CFR 1926.652 & EM 385-1-1.

2.5.4.2.4 Noise may also present a hazard. Heavy equipment operation frequently results in noise levels exceeding 85 dBA, requiring the use of hearing protection. All heavy equipment operators and personnel in the immediate vicinity of heavy equipment shall wear ear plugs or ear muffs while working.

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

2.5.4.3.2 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, AMMUNITION, AND EXPLOSIVES RELATED SCRAP

2.5.5.1 HFA will collect ordnance, ammunition, and explosive related scrap from the grids. This scrap will be turned-in to the nearest DRMO. However, if DRMO refuses to accept the scrap, arrangements shall 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. Employees must pay particular attention to what they are doing 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 chemical hazards involved with this project are 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 sampling action shall 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 UXO to detonate if not excavated properly nor shored as required. Employees must pay careful attention to what they are doing or risk serious injury. Handling procedures for preventing explosion of UXOs includes careful shovelling and removal, placement of items in proper transport containers, and maintaining positive control of the items 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 EQUIPMENT

2.6.1.1 All machinery and equipment (i.e. backhoes and all terrain vehicles) shall be inspected daily (when in use) to ensure safe operating conditions. Tests shall be made at the beginning of each day during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place. Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency which effects the safe operation of equipment is observed, the equipment shall be immediately taken out of service and shall not be used until unsafe conditions are corrected. Machinery and mechanized equipment shall be operated by designated qualified personnel. Equipment safety requirements must be in accordance with 29 CFR 1926 and EM 385-1-1 (Section 16), and the guidelines listed below:

- Operation of heavy equipment will be limited to properly trained personnel.
- Visually inspect equipment daily, prior to operation, and report any deficiencies.
- Operator(s) shall use the safety devices provided with the equipment (i.e., seatbelts, backup warning indicators and horns).

2.6.2 CONFINED SPACE ENTRY

2.6.2.1 Planned field activities do not include entry into areas which could be considered confined spaces. If any confined space entry is required (i.e., structures, vaults or trenches), then a written confined space program will be developed IAW 29 CFR 1910.146 and 1926 and submitted to the Contracting Officer for approval.

2.6.3 ELECTRICAL

2.6.3.1 Above ground utility lines should not pose a hazard to team members during field activities. A safe overhead distance (at least 15 feet) must be maintained at all times. Below ground utilities lines should not pose a hazard as long as the following procedures are followed. Excavation permits must be obtained (if required by utilities map) from the local "Miss Utilities" before commencing soil intrusive activities. HFA will complete any required forms and attach a map of the site areas for the planned digging locations. After the forms are completed, they will be submitted to the DPW for identification of any utilities lines.

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 Former Camp Croft 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 three miles of the sites, field personnel shall 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 OPEN TERRAIN

2.6.6.1 Field personnel shall become familiar with the general terrain of the site and potential physical hazards (storm drains, management ponds, 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.

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

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.

2.6.7 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 Former Camp Croft. 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 (i.e., military and commercial explosives) 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 The hazard, or exposure potential, for the contaminants of concern varies according to the substance concentration and the duration of exposure to the substance. Although the contaminants identified at Former Camp Croft are potential health hazards, contaminant concentrations are expected to be low. The overall chemical hazard assessment for the activities approved in this site-specific safety and health plan is extremely low, requiring Level D protection.

2.7.5 CHEMICALS OF CONCERN

2.7.5.1 Table 2-1 identifies contaminants which may pose an occupational health threat. For each contaminant, the following information is summarized for quick reference:

- Applicable exposure limits;
- Immediately dangerous to life and health (IDLH) levels¹;
- Ionization potential.

2.7.6 EXPOSURE LIMITS

2.7.6.1 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.

¹ *Known or suspected carcinogens are listed under the IDLH column of Table 2-1 as "carc".*

POTENTIAL CONTAMINANTS
TABLE 2-1

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

¹ Exposure limits expressed in ppm except where noted;

² Indicated that exposure limit was established to prevent dermal absorption

N/A Not Assigned, Not Available, or Not Applicable

2.7.6.2 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.

2.7.6.3 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. Exposure limits for chemical agent are U.S. Army provisional limits based on experimental data.

2.7.7 RECOGNITION OF SYMPTOMS AND SIGNS

2.7.7.1 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 shall 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 be able to recognize symptoms of these conditions and be capable of arresting the problem as quickly as possible. Monitoring for heat stress and work-rest regime can be founded in Section 8.0 of the SSHP.

2.8.2.2 The Effects of Heat

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

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

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

2.8.2.3 Heat Cramps

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

2.8.2.3.1.1 Heat Cramps Symptoms

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

2.8.2.4 Heat Exhaustion

2.8.2.4.1 Heat exhaustion occurs in individuals working in hot environments, and may be associated with heat cramps. Heat exhaustion is caused by the pooling of

blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The blood vessels in the skin become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when an individual is in an upright position, may lead to an inadequate return of blood to the heart and eventually to physical collapse.

2.8.2.4.2 Heat Exhaustion Symptoms

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

2.8.2.4.3 Heat Exhaustion Emergency Care

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

2.8.2.5 Heat Stroke

2.8.2.5.1 Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness, and even death. Direct exposure to sun, poor air circulation, poor physical

condition, and advanced age (over 40) bear directly on the tendency to heat stroke. It is a serious threat to life and carries a 20 percent mortality rate. Alcoholics are extremely susceptible.

2.8.2.5.2 Heat Stroke Symptoms

- Sudden onset
- Dry, hot, and flushed skin
- Dilated pupils
- Early loss of consciousness
- Full and fast pulse
- Breathing deep at first, later shallow and almost absent
- Muscle twitching, growing into convulsions
- Body temperature reaching 105 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.

2.8.3 COLD STRESS

2.8.3.1 Cold stress will not be a factor during this ordnance, ammunition, and explosive removal action. All removal activities will be taking place during the spring and summer months.

2.9 RADIOLOGICAL HAZARD

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

2.10 BIOLOGICAL HAZARDS

2.10.1 POISONOUS PLANTS

2.10.1.1 Poisonous Plant Avoidance Procedures

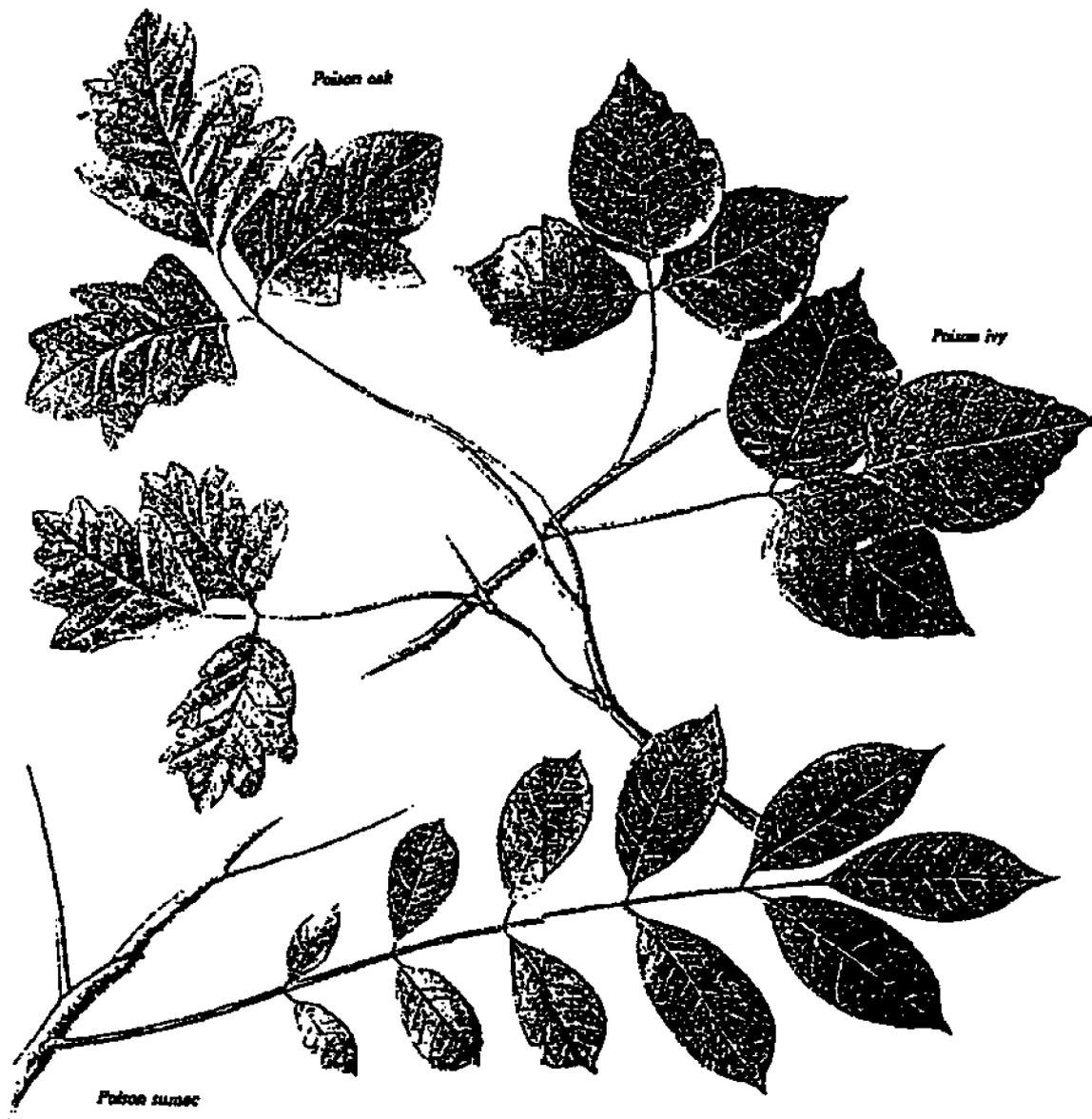
2.10.1.1.1 The best way to prevent symptoms from poisonous plants is to avoid them. This is accomplished by learning to recognize the various poison plants (See Figure 2-1) and stay away from them. Poison ivy and oak are identified by three leaves and sumac with five leaves radiating from a stem. Poison 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.

2.10.1.2 First Aid for Poisonous Plants

2.10.1.2.1 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 irritating members of the sumac family, Anacardiaceae.

2.10.2 INSECTS AND TICKS

2.10.2.1 Ants, Bees, Wasps, and Hornets

2.10.2.1.1 Stings of these insects are responsible for more deaths in the United States than bites and stings of all 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.

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

2.10.2.1.2.1 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.

2.10.2.1.2.2 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.

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

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

2.10.2.2 Ticks and Tickborne Diseases

2.10.2.2.1 Lyme Disease

2.10.2.2.1.1 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.

2.10.2.2.1.2 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.

2.10.2.2.2 Tick Avoidance Procedures

2.10.2.2.1 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.

2.10.2.2.3 First Aid for Tick Bites

2.10.2.2.3.1 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.

2.10.2.2.3.2 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.

2.10.2.3 Spiders

2.10.2.3.1 Black Widow Spider

2.10.2.3.1.1 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.

2.10.2.3.2 Brown Recluse Spider

2.10.2.3.2.1 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.

2.10.2.4 Poisonous Snakes

2.10.2.4.1 Snake Avoidance Procedures

2.10.2.4.1.1 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.

2.10.2.4.2 First Aid for Snake Bites

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

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

2.10.2.4.2.3 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.

2.10.2.5 Animals

2.10.2.5.1 The only effective measure to preclude animal bites is avoidance. Contact with all wild animals at Former Camp Croft 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.

2.10.2.5.2 There are no known Hantavirus cases in the former Camp Croft 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 Level C PPE is donned and the nest 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 Figure 3 of the Work Plan shows the line of authority/chain of command for Former Camp Croft.

3.1.3 CERTIFIED INDUSTRIAL HYGIENIST (CIH)

3.1.3.1 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.

3.1.4 HEALTH AND SAFETY MANAGER (H&S)

3.1.4.1 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.

3.1.5 PROJECT MANAGER

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

3.1.6 SENIOR UXO SUPERVISOR

3.1.6.1 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.

3.1.7 SITE SAFETY OFFICER (SSO)

3.1.7.1 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.

3.1.8 UXO SUPERVISOR

3.1.8.1 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 shall report all violations of safety and personnel injuries to the SSO and SUXOS.

3.1.9 UXO SPECIALIST

3.1.9.1 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.

3.1.10 SUBCONTRACTORS AND VISITORS

3.1.10.1 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.

3.1.11 OCCUPATIONAL PHYSICIAN

3.1.11.1 Conmed, Inc., (Dr. H.M. Haft) provides direction and oversight for HFA, Inc.'s medical surveillance program. Dr. Haft 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.

3.1.11.2 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
D. Frandsen	3/94	5/96	5/95		
F. Kittle	3/94	5/96	5/95		
A. Niederhofer	4/94	5/96	5/95		
E. Hopkins	10/93	5/96	4/94		
D. Coe	6/94	5/96			
A. Jett	4/94	5/96	6/94		
C. Chambers	6/94	5/96	7/95		
S. Volland	10/93	5/96		EMT	
J. Holm	5/96	5/96	12/95		
G. Frasier	2/95	5/96	9/95		
J. Leonard	9/93	5/96	12/95		
J. Grace	5/96	5/96			
J. Ratcliff	6/95	5/96			
M. Clark	3/95	5/96			
D. Potts		5/96			
M. Hayes		5/96			
T. Kutacher	1/95	5/96			
M. Blevina	3/95	5/96			
M. Bates		5/96			

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 CWM materials. 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.

4.3.2 PROJECT SCOPE

4.3.2.1 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.

4.3.3 SAFETY

4.3.3.1 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.

4.3.4 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

4.3.4.1 All site personnel will receive training outlined in HFA's Personnel Protective Equipment Program. A copy of the PPE Program will be maintained on site. Site-Specific training will be given on Self-Contained Breathing Apparatus (SCBA) and Level A (Trellborg High Performance Suits) if required.

4.3.5 CHEMICAL WARFARE MATERIAL (CWM) TRAINING

4.3.5.1 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.

4.3.6 BLOOD BORNE PATHOGEN TRAINING

4.3.6.1 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.

4.3.7 HEARING CONSERVATION TRAINING

4.3.7.1 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
<ul style="list-style-type: none"> • Request of individual performing task. • Change in work task that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazard. • Known or suspected presence of airborne radioactive material. 	<ul style="list-style-type: none"> • New information indicating that situation is less hazardous than originally thought. • Change in site condition that decreases the hazard. • Change in work task that will reduce contact with hazardous material.

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 or work clothing

- 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

5.2.0.1 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, Ammunition, and Explosive Removal	D	
Turn-in of Recovered Ordnance, Ammunition, and Explosive Related Scrap	D	
Quality Control	D	

CHAPTER 6

MEDICAL SURVEILLANCE

6.1 All personnel on site shall have successfully completed a pre-placement or periodic (annual) physical examination. This shall 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 shall be complete, accurate and be kept on file for 30 years after termination of employment. A minimum of the following information shall 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 physicals 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-25 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 show 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
D. Frandsen	5/95	Dr. Barzun
F. Kittle	5/95	Dr. Barzun
A. Niederhofer	3/95	Dr. Barzun
E. Hopkins	6/95	Dr. Barzun
D. Coe	7/95	Dr. Barzun
A. Jett		
J. Schwalm		
C. Chambers	3/96	Dr. Lucker
S. Volland	6/95	Dr. Barzun
J. Holm	12/95	Dr. Chen
G. Frasier		
J. Leonard	8/95	Dr. D'Ambrosio
J. Grace		
J. Ratcliff		
M. Clark	11/95	Dr. Edgecomb
D. Potts		
M. Hayes		
T. Kutscher	4/96	Dr. Randell
M. Blevins	3/96	Dr. Jens
M. Bates		

CHAPTER 7

EXPOSURE MONITORING/AIR SAMPLING PROGRAM

7.1 EXPOSURE MONITORING

7.1.1 The findings, based on the sampling actions by Environmental Science & Engineering, Inc., indicate 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 shall 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 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*

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 $\frac{1}{3}$, 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: $(W_{\text{start}}) - (W_{\text{ending}}) = (W_{\text{lost}})$.

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

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.

CHAPTER 9

STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

9.1 GENERAL PRACTICES

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

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

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

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

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

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

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

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

9.2 BUDDY SYSTEM

9.2.1 All work being performed at this facility will use the "buddy" system. These 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. These 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 shall 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 shall be provided. Employees shall be protected at all times from cave ins. Employees shall be protected from hazardous atmospheres.

9.3.2 Digging the excavation/trench and all work in the excavation/trench shall 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 1910.141 and EM 385-1-1.

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.

10.4.3 EXCLUSION ZONES (EZ)/FRAGMENTATION DISTANCE

10.4.3.1 The EZ is a work area where the greatest hazard potential for exposure to safety and health hazards may exist. 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 a non-UXO qualified personnel enter the EZ, all intrusive activities will cease while they are within the EZ/fragmentation distance.

10.5 ENTRY LOGS

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

10.6 ENTRY REQUIREMENTS

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

10.7 EMERGENCY ENTRY AND EXIT

10.7.1 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.

10.8 TRAFFIC CONTROL

10.8.1 The work at the site will at times impede local traffic and inconvenience the local population. 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. State Park Police will coordinate traffic control, for demolition operations in close proximity to public roads.

10.8.2 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.

10.9 COMMUNICATIONS

10.9.1 Cellular telephones will be the secondary/emergency and land line phones the routine

method of communication.

10.9.2 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.

10.9.3 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.

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

10.9.5 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	Land linephone	Cellar 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 shall 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, i.e., paper towels and items used in the work zones, are to be classified as industrial solid waste and shall 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 shall 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 designee 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 Vehicle, SSO Vehicle, and CP	All Operations
burn kit/blanket	SSO Vehicle, and CP	
fire extinguisher, rated at least 1A, 10BC	Each Team Vehicle, SSO Vehicle, and CP	
portable stretcher	SSO Vehicle	
15 minute eyewash	SSO Vehicle	
CPR mask/shield	Each Team Vehicle, SSO Vehicle, and CP	
Airhorn	Each Team Vehicle, SSO Vehicle, and CP	
Portable eyewash kit	Each Team Vehicle, 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 within the safe haven upwind. 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)	(803) 587-4700 or 911
Fire Department (Forestry Fire Department)	(803) 582-3533 or 911
Medical Facility (Spartanburg Regional)	(803) 560-6000
Emergency Medical Services	(803) 560-6000 or 911
State Park Rangers	(803) 734-0159
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 (Patty Berry)	205-895-1525
CEHNC Safety Office	205-895-1587/1580
Other	
CHEMTRAC	800-424-9300
Explosives Division (Department of the Treasury)	202-927-7920
Spartanburg Police	(803) 596-2038
Sheriff Dept. (Bomb Disposal Unit)	(803) 596-2646
Spartanburg Fire Dept.	(803) 596-1616

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 (i.e., SSO, UXO Supervisors, etc.).

14.3.1.1 Assessing the Emergency

14.3.1.1.1 Available information related to the emergency and the onsite capabilities should be evaluated and information listed below obtained to the extent possible:

14.3.1.1.1.1 What happened:

- 1 Type of incident;
- 2 Cause of incident;
- 3 Extent of chemical release, include extent and route of migration; and
- 4 Extent of damage to structures, equipment and terrain.

14.3.1.1.1.2 Casualties involved:

- 1 Victims (number, location and condition);
- 2 Treatment required; and
- 3 Missing personnel.

14.3.1.1.1.3 What could happen from this point; consider:

- 1 Types of chemicals onsite;
- 2 Potential for fire or explosion, coupled with the release of hazardous materials;
- 3 Location of all personnel in relation to hazardous areas; and
- 4 Potential for emergency affecting the general public or the environment.

14.3.1.1.1.4 What can be done to remediate the situation; consider:

- 1 Equipment and personnel needed for rescue and hazard migration;
- 2 Number of uninjured personnel available for response;
- 3 Resources available onsite;
- 4 Resources available from offsite response groups and agencies;
- 5 Time needed for offsite response groups to reach the site; and
- 6 Hazards involved in rescue and response.

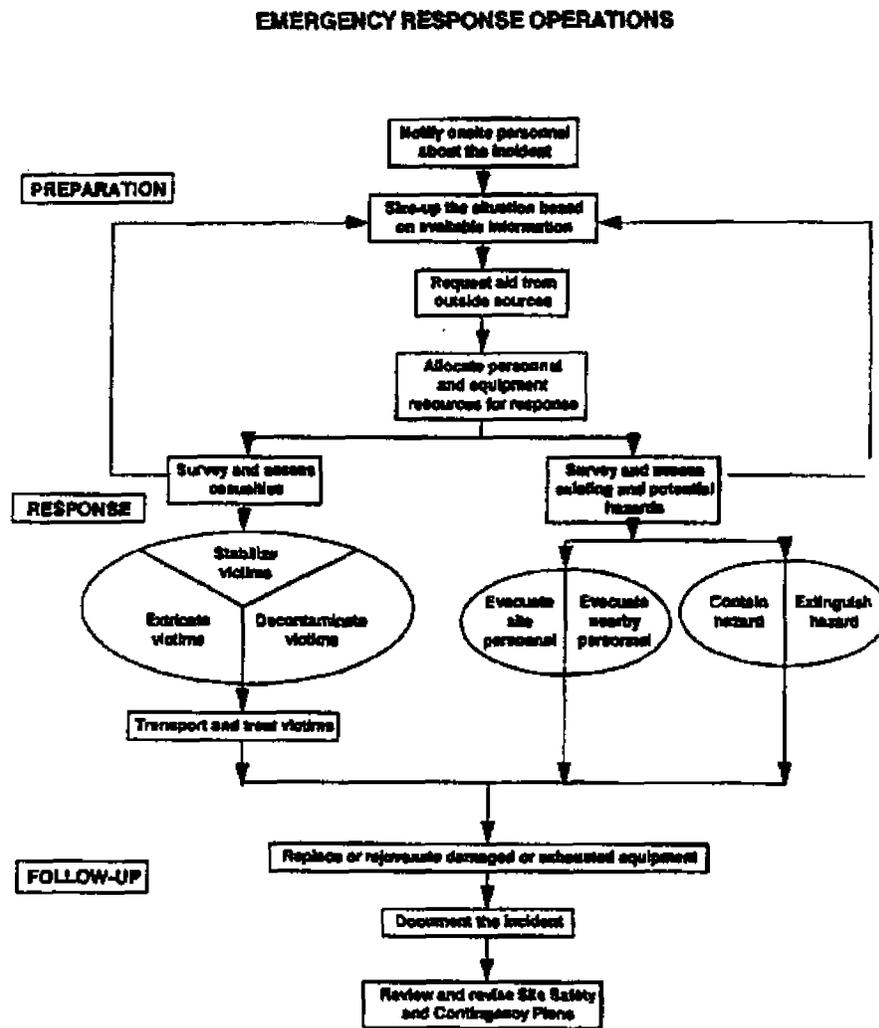
14.3.1.2 While assessing the emergency situation, notify appropriate emergency personnel and the CEHNC Safety Specialist.

14.3.1.3 Determine and coordinate the on-site personnel actions for the particular emergency situation.

14.3.1.4 Contact and coordinate with appropriate client representative(s).

EMERGENCY RESPONSE OPERATIONS

FIGURE 14-1



14.3.1.5 Immediately start a incident/accident log.

14.3.1.6 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:

14.4.1.1.1 Allow no one enter a contaminated area without a partner.

14.4.1.1.2 Personnel in the EZ should be in line-of-sight or in communication with SUXOS/SSO.

14.4.1.2 Survey casualties:

14.4.1.2.1 Locate all victims and assess their condition.

14.4.1.2.2 Determine resources needed for stabilization and transport.

14.4.1.3 Assess Existing and Potential Hazards and Determine:

14.4.1.3.1 Whether and how to respond.

14.4.1.3.2 The need for evacuation of site personnel and offsite population.

14.4.1.3.3 The resources needed for evacuation and response.

14.4.1.4 Request Aid:

14.4.1.4.1 Contact the required off and onsite personnel or facilities, such as ambulance, fire department, police, COR, etc..

14.4.1.5 Allocate Resources:

14.4.1.5.1 Allocate onsite personnel and equipment to rescue and initiate incident response operations.

14.4.1.6 Control:

14.4.1.6.1 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:

14.4.1.7.1 In the event of a suspected chemical release, emergency/rescue PPE is required.

14.4.1.8 Extricate:

14.4.1.8.1 Remove or assist victims from the area.

14.4.1.9 Decontaminate:

14.4.1.9.1 Use established procedures to decontaminate uninjured personnel in the decontamination area.

14.4.1.9.2 If the emergency makes the PDS area unsafe, establish a new area at the appropriate distance.

14.4.1.9.3 Decontaminate victims before or after stabilization as their medical condition indicates.

14.4.1.9.4 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:

14.4.1.10.1 Administer any medical procedures that are necessary before the victims can be transported.

14.4.1.10.2 Stabilize or permanently fix the hazardous condition.

14.4.1.10.3 Attend to what caused the emergency and anything damaged or endangered by the emergency.

14.4.1.11 Transport:

14.4.1.11.1 No one will be transported without being decontaminated, unless life-threatening.

14.4.1.11.2 Take measures to minimize contamination of the transport vehicles.

14.4.1.12 Casualty Logging:

14.4.1.12.1 Record who, time, destination and condition upon transport.

14.4.1.13 Evacuate:

14.4.1.13.1 Move site personnel to a safe distance upwind of the incident.

14.4.1.13.2 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:

14.4.1.14.1 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 Forestry Fire Department @ (803) 582-3533 and emergency medical services by dialing (803) 560-6000 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 shall 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 vehicle will be equipped with a first aid kit, fire extinguisher, 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 further treatment is required, the injured person will be

transported to the Hospital (see Emergency Medical Route, attached).

14.6.4 Request for transportation of injured personnel via Emergency Medical Services (EMS) will be coordinated with the Ambulance Service at (803) 560-6000. 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 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 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 department and to assist in helping the post emergency services.

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 Spartanburg Fire Department (HazMat Team) and 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 medically monitored while waiting for the HazMat and medical personnel. HFA personnel will assist with the evacuation and security of the site.

14.9 FIRST AID AND CPR

14.9.1 FIRST AID

14.9.1.1 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.

14.9.1.2 If any CPR or first aid is required to be performed by HFA employees, all such employees shall 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 EZ 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 EZ 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 EZ personnel to provide immediate life support if required;

14.11.2.4 If immediate life support is not required, or victim is stabilized, and if contact with hazardous materials are suspect, EZ personnel will decontaminate the victim with soapy water and clean water rinse;

14.11.2.5 EZ personnel will remove the victim PPE, using surgical scissors to cut off the suit, gloves and boots, and exercising caution not to exacerbate the injury;

14.11.2.6 The victim will then be transferred across the hotline to the SZ or EMS personnel;

14.11.2.7 While continuing to provide support, the EMS personnel will, if required, 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 listing of the personnel involved, including personnel onsite, site personnel who responded, personnel in charge, and offsite groups that responded;

14.13.1.3 A listing 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 recording 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 shall include radio communication, horns, and hand signals. Personnel shall be trained in the meaning of each signal, and the signals shall 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 shall be intrinsically safe and shall be capable of transmitting above background noise. Equipment shall include two-way radios or a cellular telephone, and at least one of the following:

- a bell;
- an air horn;
- a megaphone;
- a siren; or
- a whistle.

14.16 SIGNALS

14.16.1 Emergency communication signals shall 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/Bell/Siren/Whistle	One long blast (repeated three times with 5 seconds intervals between blasts): Evacuate area by nearest direction
	Two short blast: Localized problem, not dangerous to workers.
	Two long blasts: All clear
Visual signals: Hand and whole body movements	Hand clutching throat: Can't breathe.
	Hands on top of head: Need assistance.
	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 shall 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.

HAZARD ANALYSIS

ACTIVITY Site Preparation

ANALYZED BY/DATE M. Wingham 4-5-96

REVIEWED BY/DATE

Michael [Signature] 5/14/96

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Grubbing and Clearing	Potential UXO	Be alert. Mark and report all UXO located during this task.
Preliminary site inspection		Do not subject UXO to heat, shock, or friction.
	heat stress	Take appropriate weather protection measures
	Wildlife, venomous snakes, insects, biological hazards	Be alert. Watch for snakes, make noise, and do not handle wildlife. Check yourself at end of the day for ticks. Wear light color clothing with cuffs and openings closed.
	slips, trips, falls	Be alert. Watch for trip hazards and look where you walk.
	Cuts and lacerations from using cutting tools and from brush	Personnel will wear gloves and eye protection when cutting and clearing brush, personnel using chainsaws or machetes will wear protective equipment Hearing protection will be worn when using power equipment. Have water, first aid kits, communication on location.
EQUIPMENT	INSPECTION REQUIREMENTS	TRAINING
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Chainsaws, axes, brushhooks, machetes	Check chainsaw for good working conditions, saw bar and chain, fuel and spark arrestor	Inspection criteria; starting procedure; fuel is a flammable and explosive material. Proper safety equipment on site and in use. Personnel read and comply with SSHP
Heavy Equipment	Check equipment for good working condition, back-up alarms, equipment complies with 29 CFR 1926.	Vehicle operations training as needed.

HAZARD ANALYSIS

ACTIVITY OR Removal

ANALYZED BY/DATE M. Wainingham 04-5-96

REVIEWED BY/DATE *Michael Wainingham 5/10/96*

IDENTIFY TASKS	IDENTIFY POTENTIAL HAZARDS	DEVELOP CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Moving and Erecting Aluminum Shelters	Potential UXO	Be alert. Mark and report all UXO located during this task. Do not subject UXO to heat, shock, or friction.
	Wildlife, venomous snakes, insects	Be alert. Watch for snakes, make noise, and do not handle wildlife. Check yourself at end of the day for ticks. Wear light color clothing with cuffs and openings closed.
	Lifting	Use your legs, wear back supports, and use two persons.
	slips, trips, falls	Be alert. Watch for trip hazards and look where you walk.
	Cutting into the slope	Perform magnetometer check for anomalies.
LIST EQUIPMENT AND/OR MACHINERY TO BE USED IN CONDUCTING THE WORK ACTIVITIES	LIST INSPECTION REQUIREMENTS FOR THE EQUIPMENT AND/OR MACHINERY USED	DETERMINE REQUIREMENTS FOR WORKER TRAINING, INCLUDING HAZARD COMMUNICATION
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Various hand tools/magnetometer	Check for good working conditions, perform field calibration check on magnetometer.	Use IAW WP & SSHP.

HAZARD ANALYSIS

ACTIVITY UXO Operations

ANALYZED BY/DATE M. Winningham 04-5-96

REVIEWED BY/DATE Michael Winningham 5/19/96

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Establishing Boundaries and Grids	Potential UXO	Be alert. Mark and report all UXO located during this task. If using an subcontractor provide UXO escort and perform magnetometer check prior to driving stakes into the ground.
	Wildlife, venomous snakes	Be alert. Watch for snakes, make noise, and do not handle wildlife.
	slips, trips, falls	Be alert. Watch for trip hazards and look where you walk.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Magnetometers, total stations	IAW manufactures manuals	Brief subcontractor(s) on UXO Hazards.

HAZARD ANALYSIS

ACTIVITY UXO Operations

ANALYZED BY/DATE M. Winstanley 04-5-96

REVIEWED BY/DATE Michael Winstanley 5/10/96

IDENTIFY THE TASKS	IDENTIFY THE POTENTIAL HAZARDS	DEVELOP SPECIFIC CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Marking and Searching Grids Identify OE/UXO Detonate unmovable OE/UXO in place	Potential UXO	Follow WP, SSHP, and other standard practices. Stay alert. Wear level "D" PPE, IAW SSHP. Apply CEHNC Safety concepts and basic consideration for UXO Operations.
	Wildlife, snakes, insects	Be alert. Watch where you are walking and make noise.
	Slips, Trips, Falls	Stay alert. Look for trip hazards.
	heat stress	Take appropriate weather protection measures
LIST THE EQUIPMENT AND/OR MACHINERY TO BE USED IN CONDUCTING THE WORK ACTIVITIES	LIST INSPECTION REQUIREMENTS FOR THE EQUIPMENT AND/OR MACHINERY USED	DETERMINE REQUIREMENTS FOR WORKER TRAINING, INCLUDING HAZARD COMMUNICATION
Magnetometers/Metal Detectors	Daily operational checks	Train operators in the use of locating equipment and brief workers in UXO safety.
Hand tools		40 hour hazards waste worker course. Graduate of USN EOD school. Site-specific UXO and hazard training. Read and comply with SSHP.
Heavy Equipment	Check equipment for good working condition, back-up alarms, equipment complies with 29 CFR 1926.	Vehicle operations training as needed.

HAZARD ANALYSIS

ACTIVITY UXO Operations

ANALYZED BY/DATE M. Wigginsham 04-5-96

REVIEWED BY/DATE Michael D. Livingston 5/10/96

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Excavating contacts Identify UXO Move OE/UXO to temporary storage magazine Detonate unmovable OE/UXO in place	Potential UXO Unplanned Detonation Unauthorized personnel in area	Only qualified UXO Specialists will excavated UXO. Only necessary personnel excavating will be in the work area. Only hand excavations will be permitted for uncovering UXO. Post warning signs, establish exclusion zones, and stop all unauthorized persons from entry. Use caution when moving around the site
EQUIPMENT	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Shovels, trowels, picks, Schonstedt GA-52C/72B	Good repair, check daily before use	All UXO Specialists are Graduates of EOD School. Brief personnel on site specifics.
		Training in the use of hand tools
		Daily Tailgate Safety meetings
Heavy Equipment	Check Equipment for good working condition, back-up alarms, equipment complies with 29 CFR 1926.	Vehicle operations training as needed.

HAZARD ANALYSIS

ACTIVITY Demolition Operations

ANALYZED BY/DATE M. Wainham 04-5-96

REVIEWED BY/DATE *M. Wainham* 5/10/96

IDENTIFY THE PRINCIPAL STEPS INVOLVED AND THE SEQUENCE OF WORK ACTIVITIES	IDENTIFY THE POTENTIAL HAZARDS	DEVELOP SPECIFIC CONTROLS FOR EACH POTENTIAL HAZARD
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Detonating in place	Unplanned Detonation	Handle in accordance with WP, SSHP, and standard demolition procedures.
Preparing and placing charges	Unplanned Detonation	Handle in accordance with WP, SSHP, and standard demolition procedures.
	Noise	Distance and tamping. Provide hearing protection and monitor noise emission.
	Flying debris	Distance and tamping material. Protection during demolition operations at least the fragmentation distance away from disposal sites.
LIST THE EQUIPMENT AND/OR MACHINERY TO BE USED IN CONDUCTING THE WORK ACTIVITIES	LIST THE INSPECTION REQUIREMENTS FOR THE EQUIPMENT AND/OR MACHINERY USED	DETERMINE REQUIREMENTS FOR WORKER TRAINING, INCLUDING HAZARD COMMUNICATION
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Demolition materials and equipment	Good working order	In accordance with EODB/TM/TO 60A-1-1-31 and state laws.
Explosives	Properly stored and in good condition	Handle in accordance with WP, SSHP, and standard practices.
		USNAVSCOLEOD Graduates.

HAZARD ANALYSIS

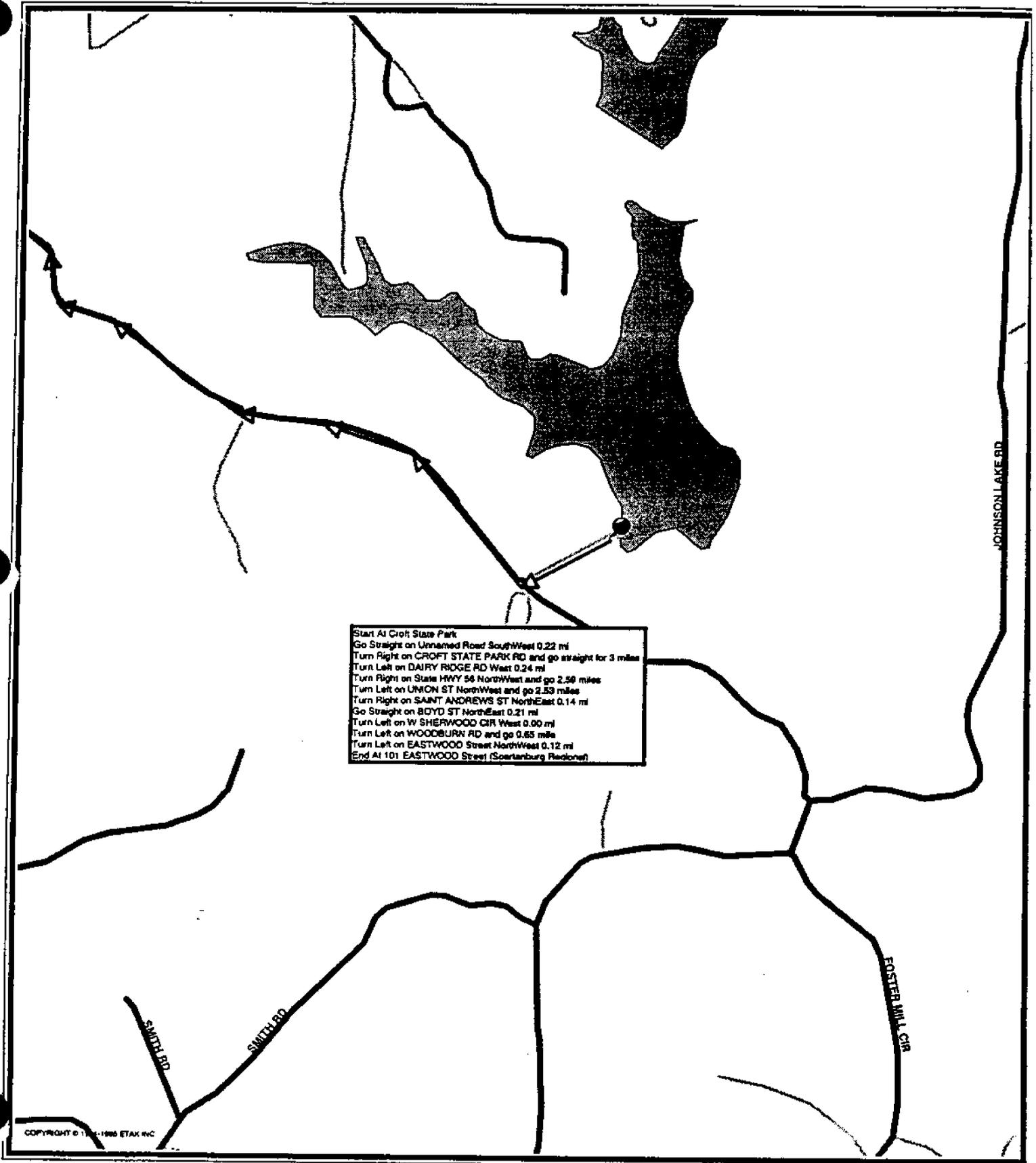
ACTIVITY Demolition Operations

ANALYZED BY/DATE M. Wainman 04-5-96

REVIEWED BY/DATE *[Signature]*

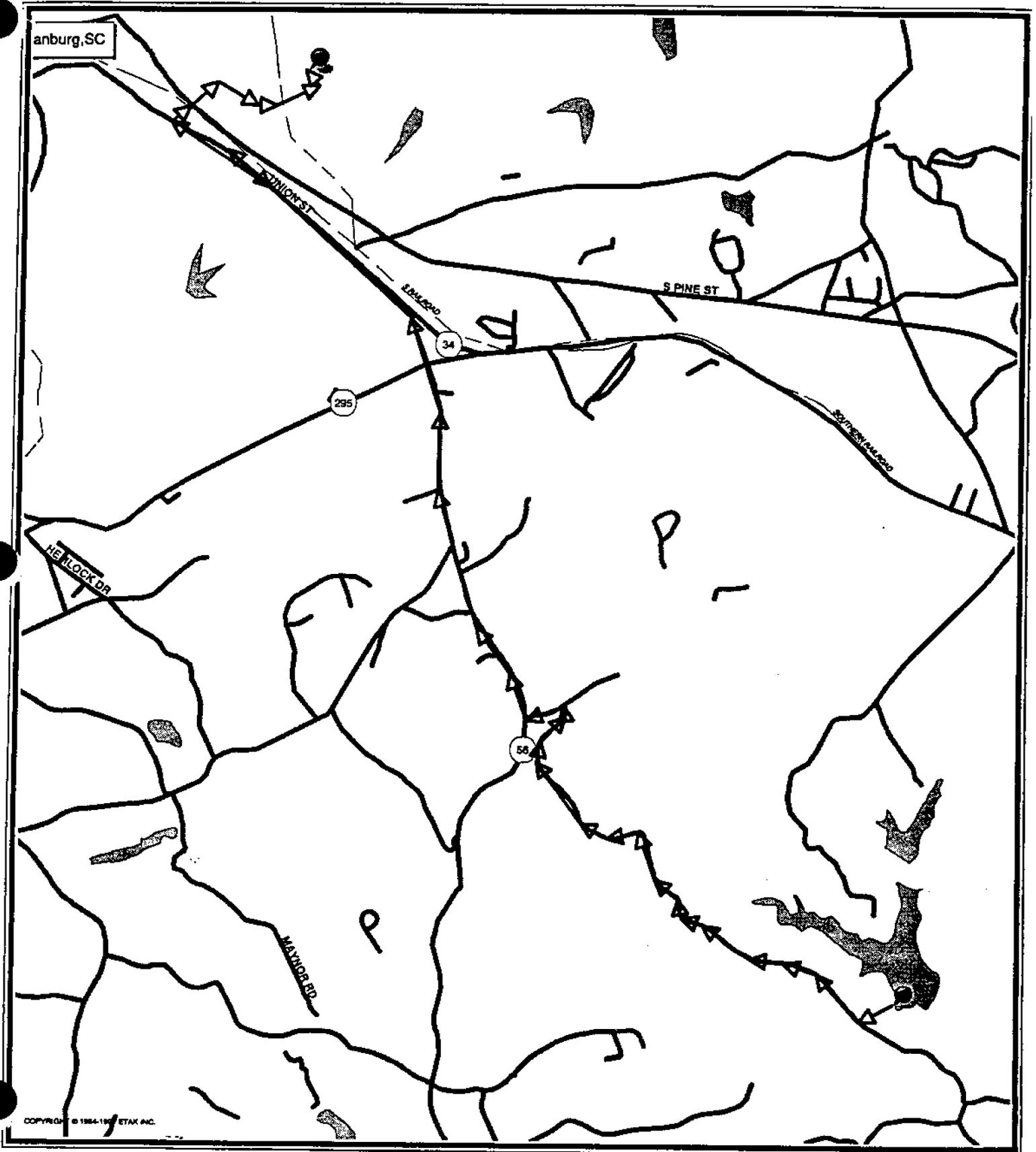
PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
<i>(Identify the principal steps involved and the sequence of work activities.)</i>	<i>(Analyze each principal step for its potential hazards.)</i>	<i>(Develop specific controls for each potential hazard.)</i>
Transporting demolition materials to site	Unplanned detonation/vehicle accident or fire	Handle and transport in accordance with WP, SSHP, and standard procedures. Use only qualified drivers. Plan routes and travel times. Inspect vehicle for explosive transportation suitability. Fire extinguisher.
Preparing and placing charges	Unplanned detonation	Handle and transport in accordance with WP, SSHP, and standard procedures.
	Noise	Distance and tamping material.
	Flying debris	Distance and tamping material.
EQUIPMENT	INSPECTION	TRAINING
<i>(List equipment and/or machinery to be used in conducting the work activities.)</i>	<i>(List inspection requirements for the equipment and/or machinery used.)</i>	<i>(Determine requirements for worker training, including hazard communication.)</i>
Demolition equipment & materials.	Good working order	In accordance with EODB/TM/TO 60A-1-1-31 and state laws.
Explosives	Properly stored	In accordance with the WP, SSHP, and standard procedures.
		USNAVSCOLEOD Graduates.

HOSPITAL ROUTE



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HOSPITAL ROUTE



APPENDIX C

SITE MAP

APPENDIX D

SAFETY CONCEPTS
AND
BASIC CONSIDERATIONS
FOR UXOS

U.S. ARMY CORPS OF ENGINEERS, HUNTSVILLE DIVISION
SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR
UNEXPLODED EXPLOSIVE ORDNANCE (UXO) OPERATIONS

INTRODUCTION

There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision. Only those personnel absolutely essential to the operation shall be allowed in the restricted area/exclusion zone during UXO activities (DoD 6055.9-STD), safety must become a firmly established habit when working with UXO, safety is the leading edge of quality.

1. GENERAL SAFETY CONCERNS,

a. Care must be observed in searching for, probing for, excavating, moving, and handling UXO. Operations on the UXO should be conducted only after the establishment of a complete plan for the operation involved and careful preparation to insure its implementation. Plans shall be based upon the minimum number of essential personnel, for a minimum amount of time, to the minimum amount of UXO consistent with efficient operations and maximum safety.

b. Only UXO qualified personnel shall be involved in UXO procedures. UXO procedures consist of gaining access (manual excavation) to subsurface UXO, identification, transportation, storage, and disposal of UXO. All personnel engaged in UXO operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures. Only personnel who have graduated from the US Naval EOD School, Indian Head MD are authorized to handle UXO and perform UXO procedures. Hazardous Devices Technicians who have graduated from the Hazardous Devices School, Redstone Arsenal, AL are not trained nor qualified to handle military UXO and will not be involved in UXO operations on a CE project.

c. The use of electro-explosive devices (EED) susceptible to EMR devices in the radio frequency (RF) range, that is, radio, radar, and television transmitters, has become almost universal. Radio frequency electromagnetic radiation consists of waves of electrical energy at radio transmission frequencies. These waves are radiated in a line-of-sight from the antennas of electronic devices that transmit radio, radar, television, or other communication or navigation radio frequency signals. The energy is usually equally radiated in all directions; however, certain types of antennas focus the energy, transmitting it in a single direction or sector only. EMR (RF) can also be reflected from large metallic surfaces or objects into areas not directly reached by the line-of-sight-radiated electric energy,

(1) Under highly undesirable conditions, enough of the energy may be picked up by portions of the EED, associated circuitry, or related objects acting as receiving antennas, to initiate the EED.

(2) Since the strength of the radiation decreases as the distance from the transmitter increases, the further away the ordnance item is, the less hazardous the situation. The energy can pass directly through materials that do not conduct electricity, such as wood or plastic. Therefore, using these materials as a barrier is of little value. The factors to be considered when evaluating the degree of hazard that the EMR (RF) energy represents are: 1) the strength of the field, that is, its power; 2) the nature of the frequencies transmitted; 3) the distance from the transmitter antenna to the ordnance, and; 4) the amount or type of protection available.

d. Some ordnance is particularly susceptible to EMR (RF) emission. This susceptibility is usually caused by the design of the ordnance item or the type of EED that is used. HERO categories have been established under which ordnance is classified as safe, susceptible, and unsafe. A knowledge of ordnance that is normally unsafe in the presence of EMR (RF) is important so that preventive steps can be taken if the ordnance is encountered in a suspected EMR (RF) field.

(1) In general, all ordnance items, even those normally safe when intact, are hazardous when extensively damaged. The damage may expose components, trailing wires, or breaks in shielding integrity that permit the entrance of EMR (RF) energy into the ordnance item and then into the EED.

(2) The presence of antennas, communication and radar devices should be a point of interest on initial site visits and preliminary assessments.

(3) The site shall be surveyed for electromagnetic radiation (EMR) radio frequency (RF) transmitters and appropriate action taken. Minimum safe distances between mobile RF transmitters, TV, and FM broadcasting transmitters and electric UXO demolition procedures are listed in Tables 2-3 and 2-4, TM 9-1375-213-12.

(4) Do not wear outer or undergarments made of wool, silk, or synthetic textiles such as rayon and nylon while working on UXO. These materials can generate sufficient static charge to ignite fuels or initiate explosives. Any person coming in contact with an UXO, shall ground himself prior to touching EEDs. This must be done to discharge any electrostatic charge accumulation from the body.

2. SITE CHARACTERIZATION

a. Make every effort to identify the UXO. Carefully examine the item for markings and other identifying features such as shape, size, and external fittings. However, do not move the item to inspect it. If an unknown UXO is encountered, photographs shall be taken and

express-mailed to CEHND-ED-SY, which has access to the TM 60-Series publications.

- b. Foreign UXO were returned to the United States for exploitation and disposal, records search should indicate the possibility of foreign UXO being on the site.
- c. If the records search indicates UXO containing military toxic chemical agents may be on the site, a decontamination plan shall be approved prior to entry onto the site. Any time a suspected chemical UXO is encountered, the 2-man concept is immediately implemented and notification shall be made through proper channels. The UXO shall be secured until the military arrives and assumes ownership.
- d. UXO which penetrates the earth to a depth where the force of the explosion is not enough to rupture the earth's surface forms an underground cavity called a camouflet. Camouflets will be filled with the end product of the explosion, carbon monoxide gas. Camouflet detection and precautions must be considered if records search indicates the site was used as an impact area.
- e. Avoid inhalation of, and skin contact with smoke, fumes, and vapors of explosives and related hazardous materials.
- f. Consider UXO which has been exposed to fire and detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents which render it much more sensitive than it was in its original state.
- g. Do not rely on the color coding of UXO for positive identification of contents. Munitions having none, incomplete, or improper color coding have been encountered.
- h. Avoid the area forward of the nose of a munition until it can be determined that the item is not a shaped charge and High Explosive Anti-Tank (HEAT) UXO. The explosive jet can be fatal to great distances forward of the longitudinal axis of the item. Assume any shaped charge munition to contain a piezoelectric (PZ) fuzing system until the fuzing is otherwise identified. A PZ fuze is extremely sensitive, can fire at the slightest physical change, and may remain hazardous for an indefinite period of time.
- i. Examine a projectile for the presence or absence of an unfired tracer.
- j. Approach an unfired rocket motor from the side. Ignition will create a missile hazard and hot exhaust.
 - (1) Do not expose electrically fired rocket motors within 25-feet of any exposed electronic transmitting equipment or exposed antenna leads.
 - (2) If an unfired rocket motor must be transported, it shall be positioned in the direction which offers the least exposure to personnel in the event of the accidental

ignition.

k. Consider an emplaced landmine armed until proven otherwise. It may not be possible to tell, or it may be intentionally rigged to deceive.

(1) Many training mines contain firing indicator charges capable of inflicting serious injury.

(2) Exercise care with wooden mines that have been buried for a long time. Because of soil conditions, the wood deteriorates and the slightest inadvertent pressure on top may initiate the fuze.

l. Assume a practice UXO contains a live charge until it can be determined otherwise, expended pyrotechnic/practice devices may contain red/white phosphorus residue. Due to incomplete combustion, phosphorus may be present and reignite spontaneously if subjected to friction or if the crust is broken.

m. Do not approach a smoking white phosphorus (WP) UXO. Burning WP may detonate the burster or dispersal explosive charge at any time.

n. The detection and identification of suspect explosive materials shall be accomplished IAW Chapter 13, TM 9-1300-214, "Military Explosives".

3. ORDNANCE RELATED HTRW ACTIVITIES

a. 29 CFR 1926.100(a) requires personnel to wear protective helmets in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock or burns. During field activities on ordnance projects, hardhats need not be worn unless a head injury threat is present.

b. Soil samples, test pit excavation, and/or monitoring well installation are sometimes conducted in areas where subsurface UXO may be found. These intrusive activities must be preceded by a magnetometer survey to assure the safety of the sampling crews.

c. Prior to the drilling rig coming on site, a magnetometer and a hand-held auger shall be utilized to assure the drilling spot is clear of subsurface UXO.

(1) After finding an area the magnetometer indicates is clear of detectable UXO, the hand-held auger should be used to start the drill hole. At not more than 2-foot depth, the hand-held auger shall be withdrawn and the magnetometer probe shall be lowered into the auger hole. This procedure will ensure small UXO items (20mm projectiles and grenades), undetectable from the surface, are now detectable. This procedure shall be repeated until the maximum depth of the hand-held auger.

- (2) Borehole monitoring shall continue at 2-foot intervals until virgin soil is encountered.

4. RESTRICTED AREA/EXCLUSION OPERATIONS,

a. Do not allow unauthorized or unnecessary personnel to be present in the vicinity of UXO. During the timeframe that UXO procedures are being accomplished, only necessary UXO personnel shall be within the restricted area/exclusion zone. When non-UXO personnel enter the restricted area/exclusion zone, all UXO procedures will cease. Limit personnel exposure time. UXO operations will always be based upon minimum exposure consistent with efficient operations.

- (1) Plan for, provide, and know the measures to be taken in the event of an accident.
- (2) Provide a designated emergency vehicle in the area in case of an accident or other emergency.
- (3) Coordination with the appropriate airspace representative shall be conducted and the appropriate notification procedures arranged.

b. Before any movement of an UXO, the fuze condition must be ascertained. If the condition is questionable, consider the fuze armed. The fuze is considered the most hazardous component of an UXO, regardless of type or condition.

- (1) In general, the condition of a BD fuze in an unexploded projectile cannot be determined through examination of its external features. When there is evidence that the projectile has been fired, the BD fuze is considered to be in the armed condition.
- (2) Arming wires and popout pins on unarmed fuzes should be secured by taping in place prior to movement.
- (3) Perform any initial movement of an armed fuze remotely and avoid any unnecessary movement of an armed fuze.

c. Personnel working with explosives and explosive ordnance shall comply with the following:

- (1) Do not carry fire or spark-producing devices on-site.
- (2) Do not smoke, except in authorized areas,
- (3) Do not have fires for heating or cooking, except in authorized areas,

(4) Do not conduct operations without approved Standing Operating Procedures (SOP) and proper supervision.

(5) Do not become careless by reason of familiarity with ammunition.

(6) Do not conduct explosive operations during electrical, sand, dust or snow storms.

(7) Do not conduct explosive operations between sunset and dawn,

d. When multiple search teams are operating on a site, the teams shall not work immediately adjacent to each other. A safe separation distance shall be established between each search team. This distance shall be based on the type of UXO expected to be encountered, but the distance shall never be less than 50m.

e. Perform initial movement of an embedded projectile remotely, First movement of an embedded projectile may cause fuze functioning. During this remote operation, precautions shall be taken for a high-order detonation.

(1) DO NOT dismantle, strip, or subject any UXO to unnecessary movement, except in response to a valid requirement.

(2) Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on the UXO, such action may arm, actuate, or function the UXO.

(3) Do not subject a mechanical time fuze to any unnecessary movement.

(4) Do not unscrew a fuze from a fuze well that does not contain a fuze cavity liner. High explosives may be on the threads.

f. Expended pyrotechnic/practice devices may contain red/white phosphorus residue. Due to incomplete combustion, red and white phosphorus may be present and reignite spontaneously if subjected to friction or if the crust is broken.

g. Do not undertake the handling or disposal of liquid propellant fuels or oxidizers if not familiar with the characteristics of the material.

h. Civil War projectiles shall be treated as any other UXO, especially projectiles with uncut Bormann time fuses and projectiles with percussion fuses, brass in particular, These have generally provided a watertight seal, even if they have been in the ground over one-hundred years. No projectile should be exposed to excess heat, the ignition point of black powder, used as a bursting charge in all Civil War projectiles is 457 degrees F. Under no circumstances should an attempt be made to drill a hole in a projectile, either through the

fuse or the body of the projectile.

i. Extra care shall be taken when uncovering a buried UXO, if records search indicated WP munitions were fired or destroyed in the area. A buried WP munition may be damaged and when exposed to air, may start burning and detonate. An ample supply of water and mud shall be immediately available if excavation reveals a WP UXO. Appropriate protective equipment (leather gloves, face shield, and flame-retardant clothing) and first aid shall also be immediately available.

5. STORAGE

a. UXOs, UXO-components, packing materials or empty boxes will not be stored in magazines containing explosives.

b. A fire plan for the storage of explosives shall be prepared and coordination with the nearby fire department shall be conducted.

6. EXCAVATION OPERATIONS

a. The usual method for uncovering buried UXO is to excavate by hand. Hand excavation is the most reliable method for uncovering UXO, but unless the UXO is very near the surface, hand excavation exposes more people to the hazard of detonation for a longer period of time than any other method. Hand excavation will be accomplished only by UXO personnel.

b. Earth moving machinery (EMM) may be used to excavate for buried UXO, if the UXO is estimated to be deeper than 12 inches. EMM shall not be used to excavate within 12 inches of an UXO. When excavation gets within 12 inches of an UXO, hand excavation shall be used to uncover the UXO, EMM may be operated by non-UXO personnel, under the direct supervision of UXO personnel.

(1) If more than one EMM will be used on the same site, they will be separated by at least 100m during excavation.

(2) During excavation operations, only those personnel absolutely necessary for the operation shall be within the restricted area/exclusion zone.

(3) Excavation and trenching shall comply with the provisions of 29 CFR 1926 subpart P.

7. DISPOSAL OPERATIONS

a. As a general rule, UXO will be detonated in place when the situation allows. All detonation-in-place should be conducted by electrical means to assure maximum control of

the site, except is extreme sandy soil which creates a static electricity hazard, Non-electrical means can be used when the situation dictates.

- (1) Do not allow one person to work alone in disposal operations. At least one person shall be available near the disposal site to give warning and assist in rescue activities in the event of an accident. Only UXO qualified personnel shall be involved in on-site disposal operations.
- (2) Initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. They manifest extreme sensitivity to friction, heat, and impact. When involved in a fire, they can be expected to detonate without burning. In storage, initiating explosives shall be kept wet with water or water/alcohol mixture. Every effort shall be made to prevent the liquid from freezing; frozen explosives material will not be handled. Lead azide shall not be allowed contact with copper, zinc, or alloys containing any concentration of such metals because of the likely formation of other azides that are more sensitive than the original lead azide, Likewise, mercury fulminate shall not be allowed contact with aluminum, magnesium, zinc, brass or bronze.
- (3) If loose, bulk explosives are to be disposed of by detonation, detonate only one kind of explosive in any one given shot.
- (4) Exercise extreme care in handling and preparing high explosives for detonation. They are sensitive to detonation by heat, shock, and friction.
- (5) Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation. The sensitivity of these explosives is greatly increased when dry.
- (6) Do not pack a bomb fuze well with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.
- (7) Photoflash bombs must be handled with the same care as black powder, and with even greater care than explosive-loaded bombs.
- (8) Some practice bombs do not contain any positive safety features. Positively identify and review all safety precautions prior to handling practice bombs.
- (9) WP UXO shall not be detonated into the ground, The UXO shall be counter-charged on the bottom-center-line.
- (10) Photoflash powder will react with moisture and generate hydrogen gas, and this reaction may generate sufficient heat or pressure to detonate the UXO, Do not look directly at photoflash UXO during detonation.

b. When disposing of high explosives by detonation, do not approach the disposal site for at least 30 minutes in the event of a misfire.

- (1) Carry blasting caps in approved containers and keep them out of the direct rays of the sun.
- (2) Do not handle, use, or remain near explosives during the approach or progress of an electrical storm. All persons should retire to place of safety.
- (3) Do not use explosives or accessory equipment that are obviously deteriorated or damaged. They may detonate prematurely or fail completely.
- (4) Always point the explosive end of blasting caps, detonators, and explosive devices away from the body during handling. This will minimize injury should the item explode.
- (5) Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap.
- (6) Use electric blasting caps of the same manufacture, whenever possible, for each demolition shot involving more than one cap.
- (7) Keep blasting caps in approved containers, located at least 25 feet from other explosives, until they are needed for priming.
- (8) Do not bury blasting caps. Use detonating cord to position blasting caps above the ground. Buried blasting caps are subject to unobserved pressures and movement which could lead to premature firing or misfires.
- (9) Test electric blasting caps for continuity at least 25 feet downwind from any explosives prior to connecting them to the firing circuit. upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to connect to the firing circuit.

c. A post-search of the detonation site shall be conducted to assure a complete disposal was accomplished.

d. If the situation dictates, protective measures to reduce shock, blast, and fragmentation damage shall be taken. Army Technical Manual (TM) 5-855-1, Fundamentals of Protective Design for Conventional Weapons and associated software program "CONWEP" contains data on blast effects, groundshock, cratering, ejecta, and fragmentation.

- (1) For non-fragmenting explosive materials, evacuation distance should be a

minimum of 1250 feet.

(2) For fragmenting explosive materials, evacuation distance should be a minimum of 2500 feet, For bombs and projectiles with caliber 5-inch or greater, use a minimum evacuation distance of 4000 feet.

(3) Items with lugs and/or strongbacks and nose and/or tail plate sections should be oriented away from personnel locations.

e. Consideration shall be given to tamping the UXO to control fragments, if the situation warrants. Fragments shall be minimized not only to protect personnel but property such as buildings, trees, etc.

f. Open burning of explosives and smokeless powder or chemical decomposition of explosives shall not be accomplished without prior approval of the contracting officer.

(1) Do not inhale the smoke or fumes of burning pyrotechnic or incendiary materials. The fumes and dust from many of these materials are irritating and/or toxic if inhaled.

(2) Do not use water on incendiary fires, water may induce a violent reaction or be completely ineffective, depending on the mixture.

(3) Bury incendiary-loaded munitions in sand when transporting them. This will smother any fire which should start until other corrective action can be taken.

(4) Anticipate a high-order detonation when burning pyrotechnics or incendiary-loaded UXO. Safety measures for personnel and property must be based on this possibility.

g. Inert UXO will not be disposed of or sold for scrap until the internal fillers have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture and air to expand and burst sealed casings. venting or exposure may be accomplished in any way necessary to preclude rupture due to confined pressure.

8. TRANSPORTATION,

a. If UXO must be transported off-site for disposal, the provisions of 49 CFR 100-199, TM 9-1300-206, and state and local laws shall be followed.

b. When transporting a possible armed fuze, position the fuze in the most neutral orientation possible.

c. Do not transport a WP munition, unless it is immersed in water, mud or wet sand.

d. If loose pyrotechnic, tracer, flare, and similar mixtures are to be transported, they shall be placed in #10 mineral oil or equivalent to minimize fire and explosion hazard.

e. If an unfired rocket motor must be transported, it shall be positioned in the direction which offers the least exposure to personnel in the event of an accident ignition.

f. If base-ejection type projectiles must be transported to a disposal area or collection point, the base shall be oriented to the rear of the vehicle and the projectile secured, in the event the ejection charge functions in route.

g. If an OEW, with exposed hazardous filler (HE, etc), has to be moved to a disposal area, the item shall be placed in a heavy duty plastic bag to prevent migration of the hazardous filler. Padding should also be added to protect the exposed filler from heat, shock, and friction.

APPENDIX E

HFA UXO GRID LOCATION FORM

HFA GRID LOCATION FORM

Each square is 5 feet by 5 feet

AREA:	SITE:	GRID:	PLAN:	CONTACTS:	DIGS:															
TEAM:			DATE:																	
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195																				
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5																				
SW	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

- | | |
|----------------|-------------------|
| 1. _____ depth | 5. _____ depth |
| 2. _____ depth | 6. _____ depth |
| 3. _____ depth | Small Arms: _____ |
| 4. _____ depth | Small Arms: _____ |

HFA GRID LOCATION FORM
Each square is 5 feet by 5 feet

AREA:	SITE:	GRID:	PLAN:	CONTACTS:	DIGS:																
TEAM:			DATE:																		
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SW	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	
	0	1	2	3	4	5	6	7	8	9	0										0

- | | |
|----------------|-------------------|
| 1. _____ depth | 5. _____ depth |
| 2. _____ depth | 6. _____ depth |
| 3. _____ depth | Small Arms: _____ |
| 4. _____ depth | Small Arms: _____ |

APPENDIX F

**STANDARD OPERATING PROCEDURES
FOR NOTIFICATION
OF UXO OPERATIONS**

**STANDARD OPERATING PROCEDURE
FOR
NOTIFICATION OF UXO OPERATIONS**

PURPOSE: To define the procedures to be used for notifying required local authorities or necessary personnel.

EMERGENCIES: In all cases emergency notification will be made directly to the Emergency 911 system via the cellular telephone. In all cases, stay on the line until help arrives.

ROUTINE: The HFA Project Manager/SUXOS will notify the following personnel of all significant events occurring within the workday, including in-place demolition of UXO.

CEHNC Safety Representative _____ **ON SITE**
Pacolet Volunteer Fire Department _____ **(803) 578-1616**
(Randy Mathis)
***South Carolina State Police** _____ **(803) 578-4700**

- Notify if necessary to close Route 176.

For demolition operations, the above authorities will be notified at least **one hour** in advance of detonation.

APPENDIX G

HFA FORMS



(Employee Name)

(Employee Number)

(Organization Unit)

CLIENT ASSIGNMENTS (See Back of Timesheet)												
CLIENT NAME			Field									Total Hours
Contract	D.O./Task	Labor Category										
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
			Field									
			Non-field									
BID & PROPOSAL												
GENERAL												
C ADMINISTRATION												
D PAID TIME OFF												
E PERSONAL LEAVE												
F OVERHEAD												
TOTAL HOURS												

SIGNATURES: _____
 (Employee)

 (Project Manager/Supervisor)

Non-field: Travel, Office, or Field Office
 Overhead: Indirect Labor, Training, Downtime, Special Programs, Physicals

NOTE: Time sheets are due in the Holicong office by the close of business on the Monday following the end of the pay period covered. If you are giving your time sheet to your Supervisor or Project Manager, he or she will make sure it gets to Holicong on time. If you are sending it to Holicong directly, FAX it there (FAX # 215-794-7353) and send the original in the mail. **DO NOT** rely on the Post Office, FedEx, or any other delivery service to get it there on time. We have external constraints that require us to run the payroll Tuesday morning, so if we do not have your time sheet we can not pay you until the next payroll, two weeks later. If you have any question about whether or not we have received your time sheet call Meg at 215-794-3535.



EXPENSE RECORD		(Employee Name)	
		\$ AMOUNT \$	
		CASH	CHARGE
T R A V E L E X P E N D I T U R E S	COMMON CARRIER (Train, Bus, Plane, Etc.)		
	PERSONAL AUTOMOBILE Miles @ \$.30		
	TAXI OR LOCAL BUS		
	AUTOMOBILE RENTAL		
	OTHER (SPECIFY)		
	DEPARTING DAY (Full or Partial)		
	AWAY DAYS (Full)		
	RETURNING DAY (Full or Partial)		
	HOTEL (Attach Receipt)		
	TELEPHONE		
MISCELLANEOUS			
TOTAL CASH EXPENDITURES			
TRAVEL ADVANCE			
CASH PAYMENT DUE (HFA/EMPLOYEE)			
TOTAL AMOUNT CHARGED			

TRAVEL RECORD	(Date)	
	DATE	TIME
FROM		
TO		
RETURNED TO		

DESCRIPTION OF WORK:

ACCOUNTING DISTRIBUTION (for Holicong use only, leave blank)		
Project #	Account #	Amount

REMARKS

I hereby certify the charges on this voucher are true and correct.

Employee Signature _____

Authorized Signature _____

TRAVEL VOUCHER OR SUBVOUCHER

(Complete by typewriter, ink, or ball point pen (PRESS HARD) do not use pencil)

FOR DO USE ONLY

READ PRIVACY ACT STATEMENT ON REVERSE PRIOR TO COMPLETING THIS FORM.

LAST NAME FIRST NAME MIDDLE INITIAL (Print/Type)		GRADE/RANK	SSN
CHECK MAILING ADDRESS (Include ZIP Code)			DUTY PHONE NO.
ORGANIZATION AND STATION			
TRAVEL ORDERS (Paragraph, S.O. No., Issuing Hq., Date) (Include amending orders)			
PRIOR TRAVEL PAYMENTS OR ADVANCES UNDER THESE ORDERS (Amount, DO Voucher No., Date Received, Place paid, or DO Station No. If none, so state)			

DO VOUCHER NO. _____

SUBVOUCHER NO. _____

PAID BY _____

1. ITINERARY (See Item 23 for Symbols)				2. COST OF LODGING		3. NUMBER OF MEALS		4. POC MILES
DATE	LOCAL TIME (24 Hour Clock)	PLACE (Home, Office, Base, Activity, City and State; City and Country, etc.)	MODE OF TRAVEL	TRAVEL	GOVT. DEED.	OPEN MESS		
19__	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							

COMPUTATIONS

5. REIMBURSABLE EXPENSES/CHARGE FOR DEDUCTIBLE MEALS* (See Item 24)			
DATE	NATURE AND EXPLANATION	AMT CLAIMED	ALLOWED

SUMMARY OF PAYMENT

Per Diem	
Actual Expense	
Mileage or Transp Allowances	
Reimbursable Expenses	
Total Entitlement	
Less Previous Payments	
Less Voucher Deductions	
Am't Charged to Acctg Class	

6. Long distance telephone calls are certified as necessary in the interest of the Government.

APPROVING OFFICER (31 USC 680a)

7. TR'S/MTA'S/MT'S (If none, so state)		
NUMBER	FROM	TO

11. PAYMENT DESIRED

CHECK CASH

12. PER DIEM REQUESTED

8. LEAVE STATEMENT: _____ days _____ hours taken between _____ and _____

9. POC TRAVEL OWNER/OPERATOR (See Item 22d) PASSENGER

13. BAS RATE _____

PENALTY: The penalty for willfully making a false claim is: A MAXIMUM FINE OF \$10,000 OR MAXIMUM IMPRISONMENT OF 3 YEARS, OR BOTH (U.S. Code, Title 18, Section 287.)

I hereby claim any amount due me. The statements on face, reverse, and attached are true and complete. Payment or credit has not been received.

14. SIGNATURE OF CLAIMANT _____ DATE _____

15. ACCOUNTING CLASSIFICATION _____

16. COLLECTION DATA _____

17. COMPUTED BY _____	18. AUDITED BY _____	19. TVL RCRD POSTED BY _____	20. RECEIVED (Payee signature and date or check no.) _____	21. AMOUNT PAID _____
-----------------------	----------------------	------------------------------	--	-----------------------

WEEKLY FORM & SUMMARY CHECK LIST

WEEK ENDING _____ LOCATION _____

FORMS REQUIRED WEEKLY	COMPLETED BY
PERSONNEL ON SITE REPORT	
PERSONNEL LEAVE & SICK REPORT	
TOTAL MAN HOURS EXPENDED FOR WEEK REPORT	
PETTY CASH REPORT	
CREDIT CARD REPORT	
TELEPHONE LOG	
DEMOLITION MATERIALS EXPENDED REPORT	
UXO TYPE AND TOTALS SPREAD SHEET REPORT	
UXO TYPE AND LOCATION BIP REPORT	
VEHICLES, FUEL AND EQUIPMENT REPORT	
PRICE QUOTE WORKSHEET, IF USED	
INFORMATION REQUIRED IN WEEKLY SUMMARY	
NAME OF CEHND SAFETY REP ON SITE	
WEATHER CONDITIONS AND TEMPERATURE	
PROBLEMS ENCOUNTERED	
ADDITIONAL PERSONNEL REQUIREMENTS	
ADDITIONAL EQUIPMENT REQUIREMENTS	
PERSONNEL VISITING WORK SITE	

WEEKLY SUMMARY

WEEK ENDING	LOCATION
CONTRACT # DACA 87-94-D-0019	TASK ORDER #
SUXOS	PM
CEHND SAFETY REP ON SITE	
GRIDS CLEARED THIS WEEK	
TOTAL GRIDS CLEARED TO DATE	
PER CENT OF PROJECT COMPLETED	
TOTAL GRIDS Q\C ed THIS WEEK	
TOTAL GRIDS Q\C ed TO DATE	
TOTAL GRIDS Q\A ed THIS WEEK	
TOTAL GRIDS Q\A ed TO DATE	
TOTAL UXO'S RECOVERED THIS WEEK	
TOTAL UXO'S RECOVERED TO DATE	
TOTAL SMALL ARMS RECOVERED THIS WEEK	
TOTAL SMALL ARMS RECOVERED TO DATE	
SCRAP REMOVED THIS WEEK, IN POUNDS	LBS
SCRAP REMOVED TO DATE, IN POUNDS	LBS

WEEKLY SUMMARY

WEEK ENDING	TASK ORDER #
SIGNIFICANT COMMENTS CONCERNING THE DAILY OPERATIONS	
COMMENTS ON: SIGNIFICANT OPERATIONS PLANNED FOR NEXT WEEK	

PERSONNEL ON LEAVE OR SICK

NAME	POSITION	TEAM #	MON	TUE	WED	THU	FRI

TOTAL MAN HOURS EXPENDED FOR THE

WEEK ENDING						LOCATION					
CONTRACT # DACA 87-94-D-0019						TASK ORDER #					
SUXOS						PM					
NUMBER OF PERS ON SITE BY DAY						TOTAL NUMBER OF MAN HRS BY DAY					
CATEGORY	MN	TU	WD	TH	FR	MN	TU	WD	TH	FR	TOT HRS
PM											
SUXOS											
TYPIST											
SSO											
O/C											
UXO SUP											
UXO SPEC											
UXO ASST											
MAG OP											
LABORER											
OTHER											
OTHER											
OTHER											

**** THE HOURS LISTED ON THIS REPORT MUST REFLECT ONLY THE HOURS PERSONNEL PHYSICALLY WORKED ON THE SITE, DO NOT INCLUDE HOURS CHARGED TO ANNUAL LEAVE, SICK LEAVE OR HOLIDAY PAY.**

COMMENTS:

DEMOLITION MATERIALS EXPENDED REPORT

WEEK ENDING				LOCATION			
CONTRACT # DACA 87-94-D-0019				TASK ORDER #			
SUXOS				PM			
DATE	HIGH EXP	NONELEC CAPS	ELECT CAPS	TIME FUZE	FUZE LIGHTER	DET CORD	JET PERF
BAL ON HAND							

** INDICATE DEMOLITION MATERIALS RECEIVED BY CIRCLING QUANTITY **

UXO'S BLOWN IN PLACE

DATE	UXO NOMENCLATURE	UXO LOCATION
COMMENTS :		

DAILY TEAM LEADER JOURNAL

TEAM # _____

TASK ORDER # _____

DATE	PROJECT
TEAM LEADER	SSO
TOTAL GRIDS COMPLETED	TOTAL EXCAVATIONS
TOTAL UXO'S	TOTAL SCRAP LBS
MAG TYPE	MAG SETTING
CLIENT: CORPS OF ENGINEERS	CONTRACT # DACA 87-94-D-0019
FIELD OPERATION TIME HRS	GOV DELAY TIME HRS
WEATHER	TEMP

GRIDS CLEARED	TOTAL UXO	BIP Y\N	TOTAL DIGS	TOTAL LBS SCRAP	HAZ MAT FOUND Y\N	BKHOE REQ Y\N

SIGNIFICANT COMMENTS:

TEAM LEADER SIGNATURE _____

ON-SITE SAFETY MEETING RECORD

Page 1 of 2

PROJECT NAME: _____ JOB NO: _____

DATE: _____ TIME: _____ LOCATION: _____

REASON FOR MEETING: (check all that apply)

- Initial site safety briefing.
- Beginning of new task. Task: _____
- Periodic safety meeting.
- New site procedures.
- New site information.
- Review of site incident.
- Other (explain) _____

MEETING ATTENDEES:

	<u>Name</u>	<u>Affiliation</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

ON-SITE SAFETY MEETING RECORD

Page 2 of 2

PROJECT NAME: _____ JOB No: _____

DATE: _____ TIME: _____ LOCATION: _____

SAFETY TOPICS PRESENTED:

- | | |
|---|--|
| <input type="checkbox"/> Site Safety Personnel | <input type="checkbox"/> Decontamination Procedures |
| <input type="checkbox"/> Site Description | <input type="checkbox"/> Emergency Response Plan |
| <input type="checkbox"/> Work Area Description | <input type="checkbox"/> Emergency Response Personnel |
| <input type="checkbox"/> Site Characterization | <input type="checkbox"/> On-site Emergency |
| <input type="checkbox"/> Work Area Characterization | <input type="checkbox"/> Off-site Emergencies |
| <input type="checkbox"/> Chemical Hazard Evaluation | <input type="checkbox"/> Site Evacuation Procedures |
| <input type="checkbox"/> Physical Hazard Evaluation | <input type="checkbox"/> Work Area Evacuation Procedures |
| <input type="checkbox"/> Toxicological Review | <input type="checkbox"/> Places of Refuge |
| <input type="checkbox"/> Heat Stress | <input type="checkbox"/> Emergency Decontamination |
| <input type="checkbox"/> Cold Stress | <input type="checkbox"/> Emergency Equipment |
| <input type="checkbox"/> Site Layout and Control Measures | <input type="checkbox"/> Emergency Telephone Numbers |
| <input type="checkbox"/> Work Zones | <input type="checkbox"/> Directions to Hospital |
| <input type="checkbox"/> Personnel Protective Equipment | <input type="checkbox"/> Medical Monitoring |
| <input type="checkbox"/> Air Monitoring | <input type="checkbox"/> Training |
| <input type="checkbox"/> Safe Work Practices - General | <input type="checkbox"/> Safe Work Practices - Task |

Other Topics or Notes: _____

NAME OF PRESENTER: _____

TITLE OF PRESENTER: _____

SIGNATURE: _____ DATE: _____

INCIDENT REPORT

Page 1 of 9

Inc. rpt. no.: _____

Date of Report: _____

SITE: _____

SITE LOCATION: _____

REPORT PREPARED BY: _____

(Printed Name/Title)

INCIDENT CATEGORY

(Check all that apply)

Injury

Illness

Property Damage

Near Miss

Fire

Chemical Exposure

Motor Vehicle

On-site Equipment

Electrical

Mechanical

Explosive

Death

Other

DATE AND TIME OF INCIDENT: _____

Narrative Report of Incident:

(Provide sufficient detail so that the reader may fully understand the actions leading to or contributing to the incident, the occurrence, and actions following the incident. Append additional sheets of paper if necessary.)

INCIDENT REPORT

Page 2 of 9

Inc. rpt. no.: _____

WITNESS TO INCIDENT

1. NAME: _____ COMPANY: _____
ADDRESS: _____
TELEPHONE NUMBER: _____

2. NAME: _____ COMPANY: _____
ADDRESS: _____
TELEPHONE NUMBER: _____

INJURIES

FIRST INJURED PERSON

Name and Address of Injured: _____

SSN: _____ Age: _____ Sex: _____

Years of Service: _____ Time on Present Job: _____

Title/Classification: _____

Severity of Injury or Illness:

_____ Disability _____ Non-disability

INCIDENT REPORT

Page 3 of 9

Inc. rpt. no.: _____

_____ Fatality

_____ Medical Treatment

Estimated Number of Days Away From Job: _____

Nature of Injury or Illness: _____

Classification of Injury:

___ Fractures

___ Heat Burns

___ Cold Exposure

___ Dislocations

___ Chemical Burns

___ Frostbite

___ Sprains

___ Bruises

___ Heat Exhaustion

___ Lacerations

___ Blisters

___ Concussion

___ Punctures

___ Bites

___ Faint/Dizziness

___ Respiratory Allergy

___ Toxic Respiratory Exposure

___ Dermal Allergy

___ Toxic Ingestion

Part of Body Affected: _____

Degree of Disability: _____

Where Medical Care was Received: _____

Address (If off-site): _____

INCIDENT REPORT

Page 4 of 9

Inc. rpt. no.: _____

If Hospitalized:

Name, Address and Telephone Number of Hospital: _____

Name, Address and Telephone Number of Physician: _____

SECOND INJURED PERSON

Name and Address of Injured: _____

SSN: _____ Age: _____ Sex: _____

Years of Service: _____ Time on Present Job: _____

Title/Classification: _____

Severity of Injury or Illness:

_____ Disability _____ Non-disability

INCIDENT REPORT

Page 5 of 9

Inc. rpt no.: _____

Medical Treatment Facility: _____

Estimated Number of Days Away From Job: _____

Nature of Injury or Illness: _____

OF INJURY:

FRACTURES

HEAT BURNS

COLD EXPOSURE

DISLOCATIONS

CHEMICAL BURNS

FROSTBITE

SPRAINS

BRUISES

HEAT EXHAUSTION

LACERATIONS

BLISTERS

CONCUSSION

PUNCTURES

BITES

FAINT/DIZZINESS

RESPIRATORY ALLERGY

TOXIC RESPIRATORY EXPOSURE

DERMAL ALLERGY

TOXIC INGESTION

PART OF BODY AFFECTED: _____

DEGREE OF DISABILITY: _____

WHERE MEDICAL CARE WAS RECEIVED: _____

ADDRESS (IF OFF-SITE): _____

INCIDENT REPORT

PAGE 6 OF 9

INC. RPT. NO.: _____

IF HOSPITALIZED:

NAME, ADDRESS AND TELEPHONE NUMBER OF HOSPITAL: _____

NAME, ADDRESS AND TELEPHONE NUMBER OF PHYSICIAN: _____

(IF MORE THAN TWO INJURIES, PROVIDE INFORMATION ON SEPARATE SHEET)

PROPERTY DAMAGE:

BRIEF DESCRIPTION OF PROPERTY DAMAGE:

ESTIMATE OF DAMAGE: \$ _____

INCIDENT REPORT

PAGE 7 OF 9

INC. RPT. NO.: _____

INCIDENT LOCATION:

INCIDENT ANALYSIS:

CAUSATIVE AGENT MOST DIRECTLY RELATED TO ACCIDENT (OBJECT, SUBSTANCE, MATERIAL, MACHINERY, EQUIPMENT, CONDITIONS):

WAS WEATHER A FACTOR?: YES NO

UNSAFE MECHANICAL/PHYSICAL/ENVIRONMENTAL CONDITION AT TIME OF ACCIDENT (BE SPECIFIC):

UNSAFE ACT BY INJURED AND/OR OTHERS CONTRIBUTING TO THE ACCIDENT (BE SPECIFIC, MUST BE ANSWERED):

INCIDENT REPORT

PAGE 8 OF 9

INC. RPT. NO.: _____

PERSONAL FACTORS (IMPROPER ATTITUDE, LACK OF KNOWLEDGE OR SKILL, SLOW REACTION, FATIGUE):

ON-SITE INCIDENT:

LEVEL OF PERSONAL PROTECTION EQUIPMENT REQUIRED IN SITE SAFETY PLAN:

MODIFICATIONS: _____

WAS INJURED USING REQUIRED EQUIPMENT?: _____

IF NOT, HOW DID ACTUAL EQUIPMENT USE DIFFER FROM PLAN?: _____

INCIDENT REPORT

PAGE 9 OF 9

INC. RPT. NO.: _____

ACTION TAKEN TO PREVENT RECURRENCE:

(BE SPECIFIC. WHAT WAS OR WILL BE DONE? WHEN WILL IT BE DONE? WHO IS THE RESPONSIBLE PARTY TO ENSURE THAT THE CORRECTION IS MADE?)

INCIDENT REPORT COMPLETED BY:

HSO NAME (PRINTED)

HSO SIGNATURE

OTHERS PARTICIPATING IN INVESTIGATION:

NAME (PRINTED)

SIGNATURE

TITLE

INCIDENT FOLLOW-UP REPORT

Page 1 of 2

Incident Number: _____

Date of Incident: _____

Site Name: _____

Project Number: _____

Follow-up Prepared By: _____

Date: _____

Outcome of Incident: _____

Physician's Recommendations:

First Injured Person: _____

Second Injured Person: _____

Other Injured Person(s): _____

Date Returned to Work:

First Injured Person: _____

Second Injured Person: _____

Other Injured Person(s): _____

Have corrective actions recommended by investigation been implemented? If not, explain why not.
What alternative actions have been taken?:

INCIDENT FOLLOW-UP REPORT

Page 2 of 2

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ATTACH ANY ADDITIONAL INFORMATION

HEAT STRESS MONITORING

NAME: _____ DATE/TIME: _____

COMPANY: _____ SITE: _____

LOCATION: _____

Pulse Rate Monitoring (30 second rest prior to first measurement):

Starting Time: _____ Pulse Rate: _____ beats/minute;
rest 30 sec: _____ rest 30: _____ b/s;
rest 30 sec: _____ rest 60: _____ b/s;
rest 60 sec: _____ rest 60: _____ b/s;

Starting Time: _____ Pulse Rate: _____ beats/minute;
rest 30 sec: _____ rest 30: _____ b/s;
rest 30 sec: _____ rest 60: _____ b/s;
rest 60 sec: _____ rest 60: _____ b/s;

Starting Time: _____ Pulse Rate: _____ beats/minute;
rest 30 sec: _____ rest 30: _____ b/s;
rest 30 sec: _____ rest 60: _____ b/s;
rest 60 sec: _____ rest 60: _____ b/s;

Starting Time: _____ Pulse Rate: _____ beats/minute;
rest 30 sec: _____ rest 30: _____ b/s;
rest 30 sec: _____ rest 60: _____ b/s;
rest 60 sec: _____ rest 60: _____ b/s;

Method of Measurement:

Carotid Artery: _____ Instrument (specify type): _____

Self-Determined and Reported: _____

Site Safety Officer: _____ (Contractor): _____ (Contract Monitor)

Site Safety Officer

ENVIRONMENTAL SITE CONDITIONS SURVEY SITE DRAWING

PROJECT:	CONTRACT NUMBER:	DELIVERY ORDER NUMBER:	DATE:

ENVIRONMENTAL SITE CONDITIONS SURVEY REPORT

PROJECT:	CONTRACT NO:
DELIVERY ORDER #:	DATE:
UXO PROJECT LEADER:	SIGNATURE:
GENERAL SITE DESCRIPTION:	
A. TREES:	
B. SHRUBS & GRASSES:	
C. ON/OFF-SITE DRAINAGE:	
C. ACCESS/HAUL ROADS:	
E. DRAIN CULVERTS:	
F. FENCING:	
G. PREEXISTING REFUSE/DEBRIS:	

VISITOR'S SAFETY BRIEFING

- _____ 1. Point out safe area and restricted areas.
- _____ 2. Point out potential hazards and risks.
- _____ 3. Wear hard hats, safety glasses.
- _____ 4. Watch where walking at all times.
- _____ 5. Do not pick anything up.
- _____ 6. Stay with escort.
- _____ 7. Deposit matches and lighters in receptacles.
- _____ 8. Brief on site evacuation plan and emergency procedures.

HFA SECURITY/POWER LOG
MONTH: _____

DATE	TIME	OPENED BY:	SECURED BY:	TIME	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
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28					
29					
30					
31					

APPENDIX H
HFA RESUMES

RICHARD T. THIEL**SENIOR PROJECT MANAGER**

DATE ATTENDED BASIC EOD SCHOOL: August 1962 - August 1963

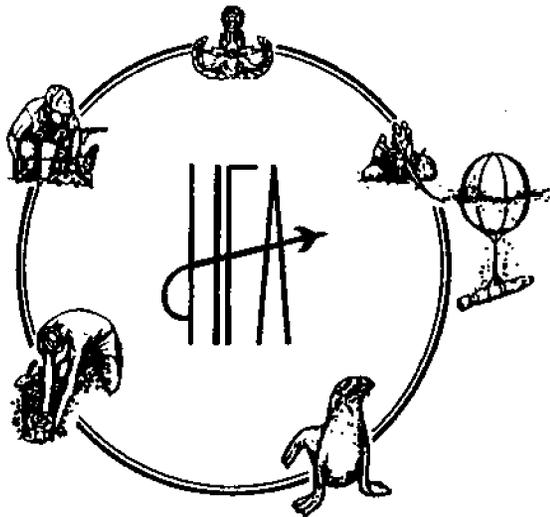
Other Pertinent Training: OSHA 40 Hour-10/93, 8 Hour Sup-8/90, 8 hour Refresher-5/95**EOD/UXO ASSIGNMENTS:**

- Sep 63 - Jun 64 U.S.S. Currituck. EOD Technician providing EOD support for shipboard operations, including nuclear weapons, underwater, & air ordnance.
- Jul 64 - Aug 65 EOD Detachment, Naval Weapons Station, Concord, CA. EOD Technician. Participated in disposal of large quantities of grade three ammunition and pyrotechnics by burning and detonation.
- Oct 65 - Oct 66 EOD Detachment, Saigon, Republic of Viet Nam. Provided EOD support for Corps and the rivers and coastlines of Viet Nam.
- Dec 66 - May 69 EOD Detachment, Adak, AK. Senior Team Member providing EOD support for Naval Air Station, Adak. Recovered and disposed of over 7,000 rounds of ordnance buried by U.S. Army at end of WWII.
- Sep 70 - Dec 75 NAVSCOLEOD, Indian Head, MD. Served as an Instructor in various training divisions.
- Jan 76 - Jun 79 EODTEUONE, Barbers Point, HI. Provided training to Pacific Fleet EOD Units and other fleet personnel. Served as an Operational Readiness Inspector, inspecting Pacific Fleet EOD Units.
- Sep 79 - Oct 82 EOD Detachment, Coronado, CA. Served as Team Chief. Provided EOD support to all Pacific Fleet aircraft carriers. Assisted EOD Detachment, North Island, in range clearances at the Naval Gunfire Range, San Clemente, CA.
- Nov 81 - Sep 85 NAVSCOLEOD, Indian Head, MD. Senior instructor in Core Division.
- Oct 85 - Oct 87 EOD Mobile Unit Three, Command Master Chief, NAB, Coronado, CA. Responsible for management and assignment of personnel and resources. Conducted range clearances at the Naval Gunfire Range, San Clemente Island and Naval Weapons Center, China Lake.
- Oct 87 - Apr 90 Served as Enlisted Detaller for EOD Community until retirement.
-
- Apr 90 - Present HFA, Inc. He was Team Leader/UXO Supervisor for 20 projects at Edgewood and Aberdeen Proving Grounds. QC/Safety Officer for the Artillery Range Clearance at Camp Sarcee, Calgary, Alberta, Canada. HFA PM providing UXO support for the first United Nations inspection of nuclear facilities in Baghdad, Iraq. Project Manager for removal and disposal of 26 tons of nitrocellulose at abandoned DuPont Smokeless Powder Plant. Project Manager for Rocky Mountain, Black Hills, Tooele, Tooele South, Ft. Ord, and Ogden Projects. Senior Project Manager, Contract DACA87-94-D-0019 and DACA87-95-D-0027.

Certificate of Training

This Certifies That

Richard T. Thiel



Satisfactorily Completed the

**OSHA 8 - Hour Hazardous Waste Site Worker
Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120**

Presented by Human Factors Applications, Inc.

Dated this 13th Day of May 19 95


INSTRUCTOR

Training Certificate

Presented to

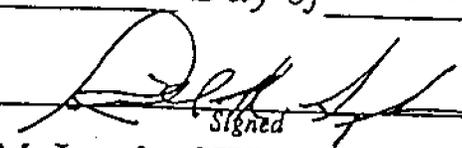
Richard T. Thiel

*Has successfully completed
a training course for*

Hazardous Waste Site Health & Safety Supplement - 1910.120(e)9 40-Hr Equivalent
at

Environmental Safety Management Corporation

Presented this 10th *Day of* October 19 93


Signed
Richard M. Lynch, CIH

President

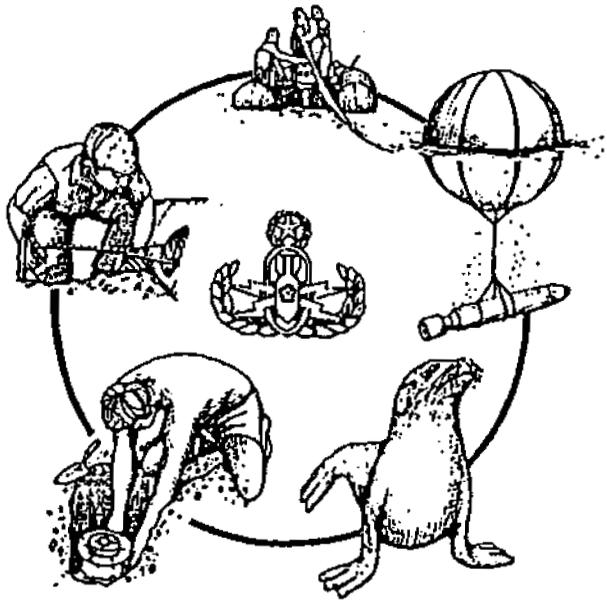
Certificate of Training

This Certifies That

RICHARD T. THIEL

*Satisfactorily Completed the
OSHA 8-Hour Supervisors Course*

Presented by Human Factors Applications Inc.



Dated this 23rd Day of August 19 90

Samuel J. Hooper SR.
Samuel J. Hooper SR.

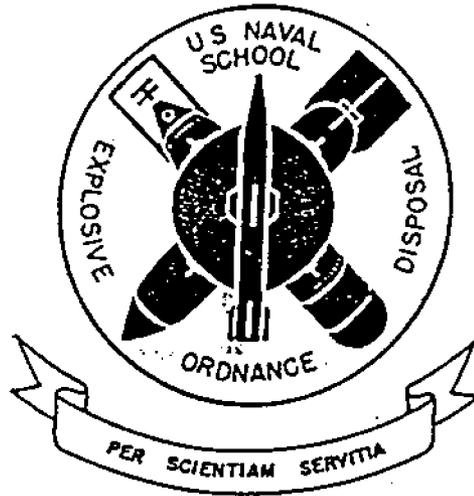
INSTRUCTOR

Fenoy W. Butler
Fenoy W. Butler

DIVISION MANAGER

U.S. Naval School

Explosive Ordnance Disposal



This certifies that

Third Class Engineman Richard T. THEL, 479 72 56, USN

having successfully completed the prescribed course of stu

or

Nuclear Weapons Disposal

is awarded this

Certificate

this 30th day of August A.D. 1963



J. S. FEELER, CDR, USN

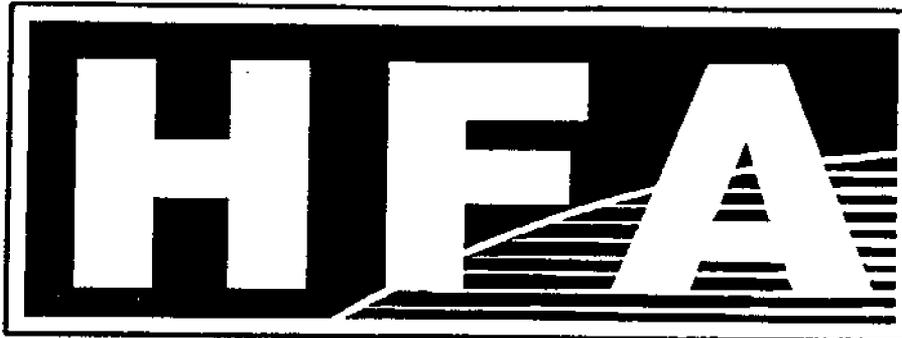
COMMANDING OFFICER

DAVID J. FRANDBEN**SENIOR UXO SUPERVISOR**

DATE ATTENDED BASIC EOD SCHOOL: January 1971 - December 1971

EOD/UXO ASSIGNMENTS:

- Feb 72 - Apr 76 EODGRUTWO, Ft. Story. Team Member. Range Clearances at various locations. Special Assignment to Suez Canal. Responsible for UXO clearance and EOD Training of Egyptian Special Forces.
- Apr 76 - Jun 78 EODDET Charleston Naval Weapons Station. Range Safety. Range clearance at Ft. Bragg. Chemical and Nuclear waste support and disposal.
- Jun 78 - Jun 81 EODET Keflavik, Iceland. Detachment Leading Chief. Unit Operations CPO. Range Safety CPO, Training CPO. Responsible for management, assignment and resourcing of hazardous chemical clean-up and disposal.
- Jun 81 - Jun 83 EODTEUTWO Ft. Story. Division Senior Chief and Instructor. Responsible for training Lebanese Army (special assignment) Ordnance clearance in Beirut Lebanon.
- Jun 83 - Nov 85 EODDET Pt. Mugu, CA. Detachment Senior Chief, Safety Officer, Diving Supervisor. Managed missile and RSP mine recovery. Provided EOD services to Secret Service and law enforcement. Operation of Mini Ranger Navigational System.
-
- Jan 92 - Mar 93 EOD World Services. EOD Team Leader in Kuwait. Managed UXO teams in the clearance of bombed and burned ASPs. Desert clearance of all types of U.S. and foreign ordnance.
- 9/93 - Present HFA, Inc. UXO Specialist, Contract DACA87-92-D-0133, DO #07, Tooele, NE. Senior UXO Supervisor, DO #15, Ft. Ord, CA for the clearance of Laguna Seca parking area. Contract DACA87-94-D-0019, UXO Specialist, TO #02, Camp Croft, SC and Senior UXO Supervisor, TO #05, #09 and #10, Ft. Devens, MA, Sampling Action and Bureau of Prisons OE Removal Action.



CERTIFICATE OF TRAINING

This Certifies That

DAVID J. FRANDSEN

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

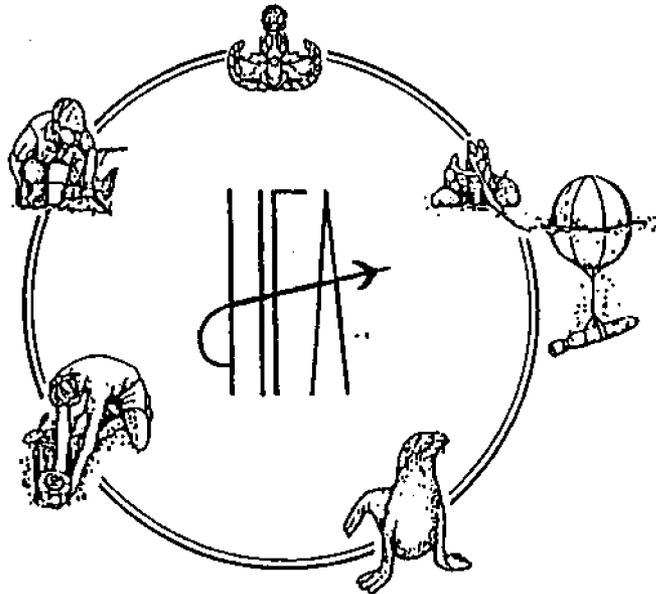
Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training

This Certifies That

David Frandsen



**Satisfactorily Completed the
OSHA 8 - Hour Supervisor Course
Hazardous Waste Worker
29 CFR 1910.120**

Presented by Human Factors Applications, Inc.

Dated this 9th Day of August 19 94

Instructor

Certificate of Training

This Certifies That

David Frandsen

**Satisfactorily Completed the
OSHA 40 - Hour Hazardous Waste Site Worker Course**

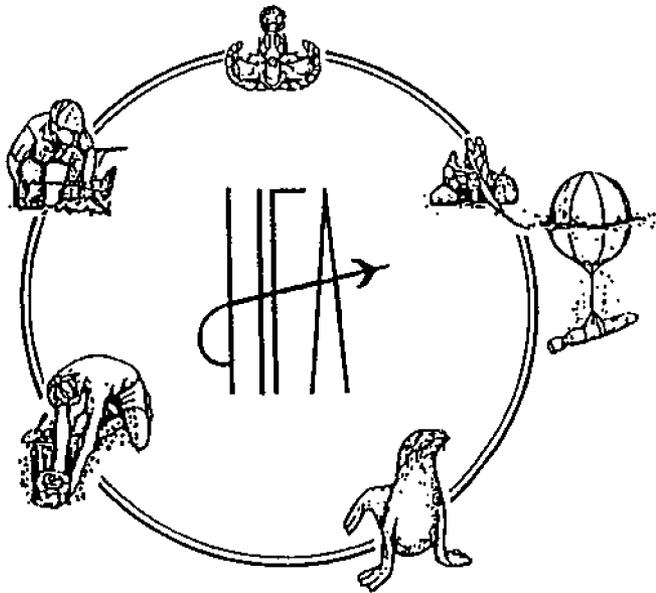
**Hazardous Waste Worker
29 CFR 1910.120**

Presented by Human Factors Applications, Inc.

Dated this 30th Day of March 19 94



INSTRUCTOR



OPTIONAL FORM NO. (7-72)
 FAX TRANSMITTAL

Page 1 of 1

To: DANIEL FRANDSEN
 Dept. Agency

From: NANSOLEOD
 Phone # 301 743 4335

Fax # 301 743 4335
 GENERAL BETVICER ADMINISTRATION
 4335

Fax # 015 538 734
 HIGH 7610-01-317-7368
 5099-101



Naval School Explosive Ordnance Disposal Certificate of Completion

Presented To

Aviation Ordnanceman First Class
 David J. Frandsen, USN

For having successfully completed
 the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL PHASE II

18 February 1972

Date

John J. Walsh

JOHN J. WALSH, CDP, USN
 Commanding Officer

ARNOLD A. NIEDERHOFER SITE SAFETY OFFICER

DATE ATTENDED BASIC EOD SCHOOL: December 1955 - June 1956

EOD/UXO ASSIGNMENTS:

- Jun 56 - Jun 60 20th Ord Det (EOD), Germany. Participated in range clearance operations.
- Jun 60 - Feb 68 Range Service Division, EOD Section, White Sands Missile Range, NM. Participated in range clearance operations.
- Feb 68 - Feb 69 EOD Technician, 184th Ordnance Battalion (AMMO), EOD Section, Vietnam. Participated in range clearance operations.
- Feb 69 - Apr 72 EOD Technician, EOD Division, Redstone Arsenal, AL.
- Apr 72 - Jun 75 EOD Technician, 2nd Ord Det (EOD), Germany. Participated in range clearance operations.
- Jun 75 - Jan 76 U.S. Army Sergeant's Major Academy, Non-EOD Assignment
- Jan 76 - Aug 78 41st Ord Det (EOD), Fort Bliss, TX. Managed the training of EOD personnel. Managed all range clearances and UXO disposal operations.
- Aug 78 - Aug 79 546th Ord Det (EODCC), Fort Sam Houston, TX. Supervised and trained EOD personnel. Responsible for managing, assigning and resourcing all range clearances and UXO disposal operations.
-
- Aug 84 - Aug 87 EOD Supervisor, Terminal Effects Research and Analysis Group, New Mexico Tech, Socorro, NM. Supervised 6 EOD technicians and 4 ordnance handlers.
- Jun 90 - Oct 91 EOD Technician, New Mexico Institute of Mining and Technology, Socorro, NM. Conducted explosive tests and fired large and small caliber guns.
- Nov 91 - Sep 93 EOD Team Leader/QA/QC Officer/Site Supervisor, OHM Corporation, Fort Meade, Maryland. Managed daily operations during the range clearance of a 7,500 acre site.
- Feb 94 - Dec 95 HFA UXO Supervisor, Contract DACA87-92-0133, DO #15, Ft. Ord, CA. Contract DACA87-94-D-0019, UXO Specialist, TO #02, Camp Croft, SC. SSO/QC Officer for the Ft. Devens OE Sampling Action and Bureau of Prisons OE Removal Projects, MA.



CERTIFICATE OF TRAINING

This Certifies That

ARNOLD A. REIDERTHOFFER

Satisfactorily Completed the

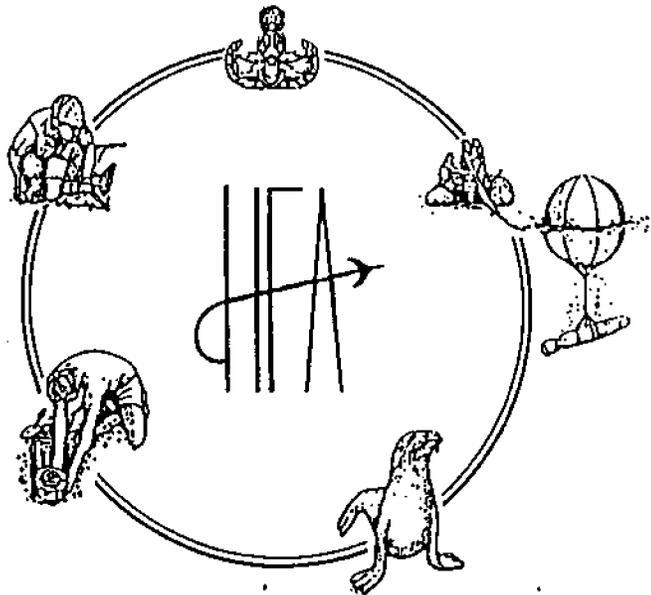
**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR



Certificate of Training

This Certifies That

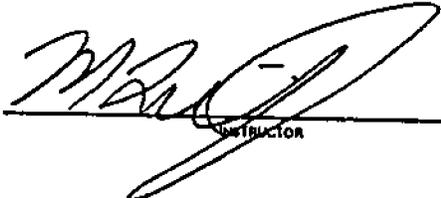
Arnold A. Niederhofer

**Satisfactorily Completed the
OSHA 40 - Hour Hazardous Waste Site Worker Course**

**Hazardous Waste Worker
29 CFR 1910.120**

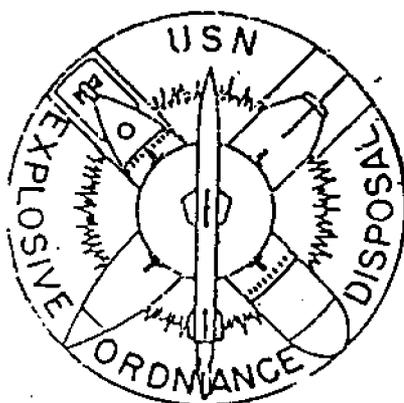
Presented by Human Factors Applications, Inc.

Dated this 30th Day of March 9 94


Instructor

U.S. Naval School

Explosive Ordnance Disposal



This certifies that

SPECIALIST FIFTH CLASS ARNOLD A. NIEDERHOFER RA 18 L93 L97

having successfully completed the prescribed course of study
for

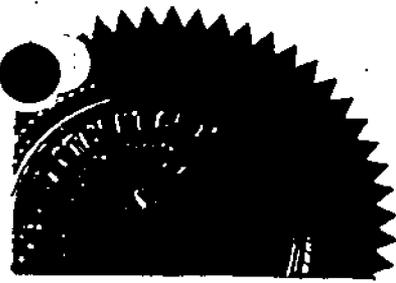
Explosive Ordnance Disposal

is awarded this

C E R T I F I C A T E

this 25th day of November A. D. 1960


E. G. SEIKORE, CDR, USNR
OFFICER IN CHARGE



FLOYD A. KITTLE QUALITY CONTROL OFFICER

DATE ATTENDED BASIC EOD SCHOOL: January - July 1959

EOD/UXO ASSIGNMENTS:

- Jul 59 - Oct 62 EOD Specialist, 864th EOD, Fort Bragg, NC. Participated in numerous range clearances.
- Nov 62 - Dec 63 EOD Supervisor, 24th EOD, Korea. Supervised range clearance operations and destruction of dud and unserviceable ammunition.
- Jan 64 - Apr 65 EOD Supervisor, 58th EOD, Fort MacArthur, CA. Supervised range clearance operations at Fort Irwin, CA.
- May 65 - Jan 69 Instructor, NAVSCOLEOD. Trained U.S. military and allied foreign students in EOD procedures.
- Feb 69 - Dec 69 EOD Supervisor, 8th EOD, Korea. Supervised range clearance operations.
- Jan 70 - Sep 72 Instructor, NAVSCOLEOD. Trained U.S. military and allied foreign students in EOD procedures.
- Oct 72 - Oct 73 EOD Operations Sergeant, 24th EODC, Korea. Participated in range clearance operations and destruction of unserviceable ammunition.
- Nov 73 - Sep 76 EOD Supervisor, USATECHDET, Naval EOD Facility, Maryland. Reviewed and prepared new EOD publications.
- Oct 76 - Dec 77 Senior EOD Supervisor, 7th EOD, Korea. Provided management guidance for all range clearance operations.
- Jan 78 - Nov 79 Senior EOD Supervisor, 58th EOD, Fort Sill, OK. Managed range clearance operations.
-
- Mar 89 - Jan 91 Senior Advisor, Range Management/EOD, Vinnell Corporation, Saudi Arabia. Advised and assisted in the clearance of 75,000 acres. Trained Saudi enlisted men in range clearance and EOD operations.
- Jun 91 - Apr 92 Demilitarization Manager, Brown & Root, Saudi Arabia. Managed the safe destruction of over 10,000 tons of unserviceable U.S. ammunition. Responsible for management, assignment and resourcing 65 U.S. and TCN personnel.
- Dec 92 - Aug 93 Search Team Leader, OHM Corporation. Supervised a five person search team during range clearance operations on Fort Meade, MD



CERTIFICATE OF TRAINING

This Certifies That

FLOYD M. KITTLE

Satisfactorily Completed the

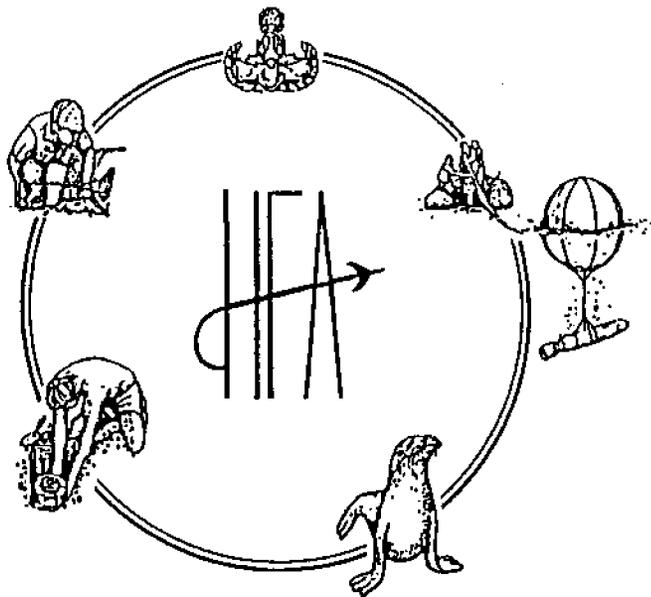
**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR



Certificate of Training

This Certifies That

Floyd A. Kittle

**Satisfactorily Completed the
OSHA 40 - Hour Hazardous Waste Site Worker Course**

**Hazardous Waste Worker
29 CFR 1910.120**

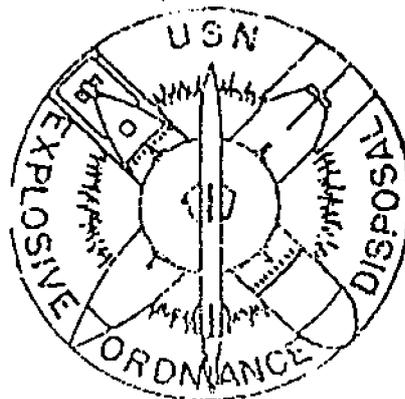
Presented by Human Factors Applications, Inc.

Dated this 30th Day of March 19 94



INSTRUCTOR

U.S. Naval School
Explosive Ordnance Disposal



This certifies that

PRIVATE FLOYD A. KITTLE RA13647663

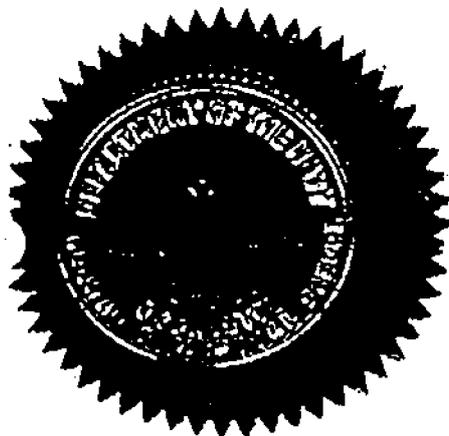
having successfully completed the prescribed course of study
for

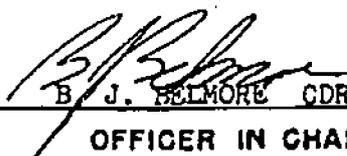
Explosive Ordnance Disposal

is awarded this

CERTIFICATE

this 17th day of July A. D. 1959




B. J. BELMORE CDR USNR
OFFICER IN CHARGE

EMMETT L. HOPKINS UXO SUPERVISOR

DATE ATTENDED BASIC EOD SCHOOL: January - July 1981

EOD/UXO ASSIGNMENTS:

- Jul 81 - Jul 83 USAF, 56th Equipment Maintenance Squadron, MacDill AFB, FL. EOD Specialist. Performed disposal operations on explosive wastes, rejected and serviceable excess ordnance items. Performed range cleanup operations on a periodic basis at Avon Park Bombing and Gunnery Range.
- Jul 83 - May 87 USAF, 7004th EOD Flight, Aviano AB, Italy. Performed task qualification evaluations on four EOD teams to ensure personnel were maintaining proficiency in emergency response and technical procedures. Maintained ground and explosive safety programs.
- Jul 87 - Oct 91 USAF, 56th ABOSq, MacDill AFB, FL. EOD Superintendent, Unit Explosive Safety Officer. Supervised 26 EOD personnel. Responsible for emergency response to incidents involving explosives or munitions. Range decontamination at Avon Park AF Range, including operation of a hazardous waste treatment facility disposing of explosive wastes.
-
- Oct 91 - Dec 92 Osprey Environmental Response, Inc., Tampa, FL. UXO Section Supervisor. Licensed Florida Blaster. Pursued UXO contracts, established explosive procedures for dealing with shock sensitive chemicals and pressurized tank cars involved in derailments. Responded to hazardous materials incidents providing containment and cleanup.
- Jun 93 - Present HFA, Inc. Contract DACA87-92-D-0133: UXO Specialist, DO #02, Black Hills Army Depot, SD; UXO Specialist/UXO Supervisor, DO #09, Pueblo Depot, CO; UXO Specialist DO #15, Fort Ord, CA. Contract DACA87-94-D-0019: UXO Specialist, DO #02, Spartanburg, SC; UXO Specialist, DO #10, Ft. Devens, MA; UXO Specialist, DO #08, Ft. Meade, MD.



CERTIFICATE OF TRAINING

This Certifies That

EMMETT L. HOPKINS

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

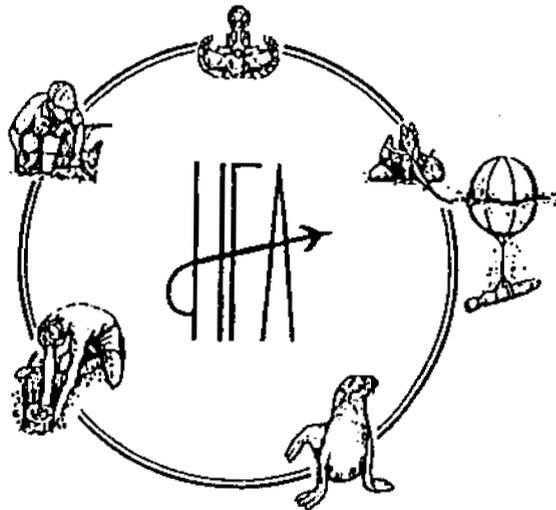
Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training

This Certifies That

Emment L. Hopkins



Satisfactorily Completed the

**8 - Hour Hazardous Waste Site Worker
Chemical Warfare Material (CWM) Training Course**

**Occupational Health Guidelines for
Exposure to Mustard Agents
DA PAM 40 - 173**

Presented by Human Factors Applications, Inc.

Dated this 19th Day of May 19 95

Michael W. King
INSTRUCTOR

Certificate of Training

This Certifies That

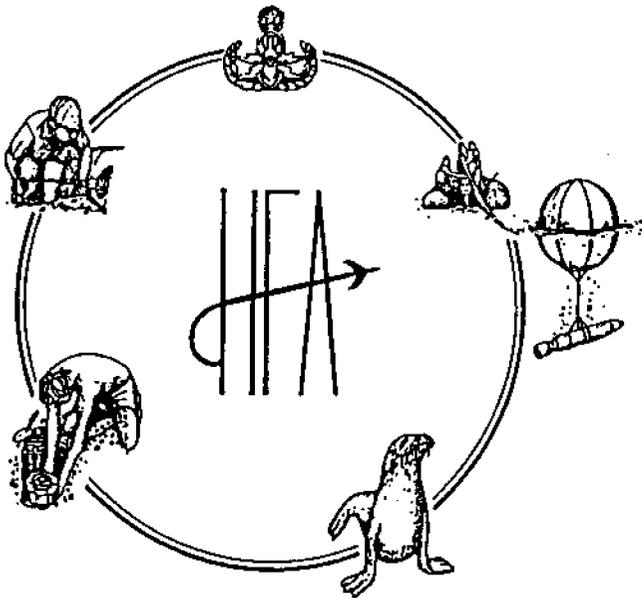
Emmett I. Hopkins

Satisfactorily Completed the

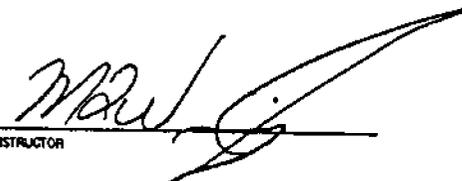
OSHA 8 - Hour Course

**Hazardous Waste Site Supervisor
29 CFR 1910.120**

Presented by Human Factors Applications, Inc.



Dated this 30th Day of April 19 94


INSTRUCTOR


PROGRAM MANAGER

P. 02

Training Certificate

Presented to
Emmett L. Hopkins

*Has successfully completed
a training course for*

Hazardous Waste Site Health & Safety Supplement - 1910.120(e)9 40-Hr Equivalent
at

Environmental Safety Management Corporation

Presented this 10th Day of October 19 93.


Signed
Richard M. Lynch, CIH

President



**Naval School
Explosive Ordnance Disposal
Certificate of Completion**

Presented To

*Staff Sergeant
Emmett L. Hopkins, USAF*

For having successfully completed
the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL PHASE II

15 July 1981

Date

John J. Walsh
JOHN J. WALSH, CDR, USN

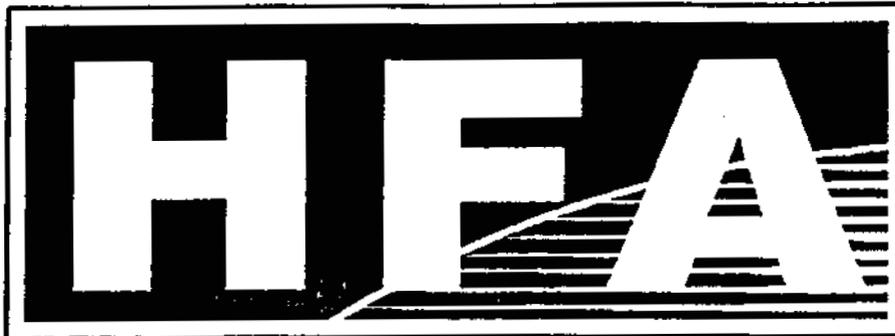
Commanding Officer

DAVID P. COE**UXO SUPERVISOR**

DATE ATTENDED BASIC EOD SCHOOL: March - September 1979

EOD/UXO ASSIGNMENTS:

- Oct 79 - Dec 81 EOD Unit, Vandenburg AFB, CA. Supported range clearances operations at Camp Cook consisting of all sizes of projectiles and GP bombs.
- Dec 81 - Dec 82 EOD Unit Incirlik AB, Turkey. Team chief. Cleared NATO Gunnery and Bombing ranges. MK series bombs, 2.75 FFAR, cluster bombs and mortars.
- Dec 82 - Apr 86 EOD Unit, Vandenburg AFB, CA. Range clearance of Camp Cook consisting of anti-tank mines, 75mm and 8" projectiles, GP bombs and 2.75 FFAR.
- Apr 86 - Oct 89 EOD Unit, Incirlik AB, Turkey. Superintendent and Safety/QC of a 27 man unit. Cleared NATO Gunnery and bombing ranges of MK series bombs, cluster bombs. 2.75" FFAR , 60mm and 4.2 inch mortars.
- Oct 89 - Oct 91 EOD Unit, Eglin AFB, FL. Disposed of munitions on one of the largest Air Force bombing ranges. Clearances consisted of iron bombs, ICM systems, clusters and other varies items.
- May 92 - Dec 92 ECC, Al Jaber AB, Kuwait. Recovered munitions that had been utilized during the war in Kuwait.
- Dec 92 - May 93 EOD Technology, Raritan Arsenal. UXO specialist and safety representative. Sub-surface clearance of Muster Gas burial site. Level A & B PPC required.
- May 93 - HFA, Inc. UXO Specialist and UXO Supervisor , Contract DACA87-92-D-0133, Ft. Sill, OK . UXO Specialist, Contract DACA87-94-D-0019, Ft. Devens, MA Sampling Action and Bureau of Prisons OE Removal Action.



CERTIFICATE OF TRAINING

This Certifies That

DAVID P. COE

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

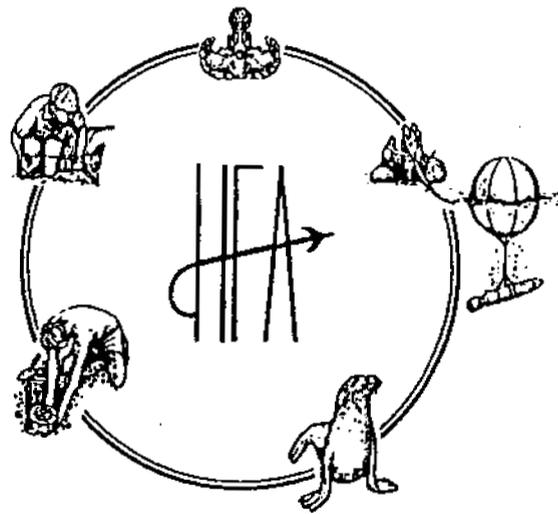
Dated this 10th Day of May 19 96

INSTRUCTOR

Certificate of Training

This Certifies That

David B. Coe



Satisfactorily Completed the

**8 - Hour Hazardous Waste Site Worker
Chemical Warfare Material (CWM) Training Course**

**Occupational Health Guidelines for
Exposure to Mustard Agents
DA PAM 40 - 173**

Presented by Human Factors Applications, Inc.

Dated this 19th Day of May 19 95

Michael B. ...
INSTRUCTOR

Certificate of Training

This Certifies That

David Coe

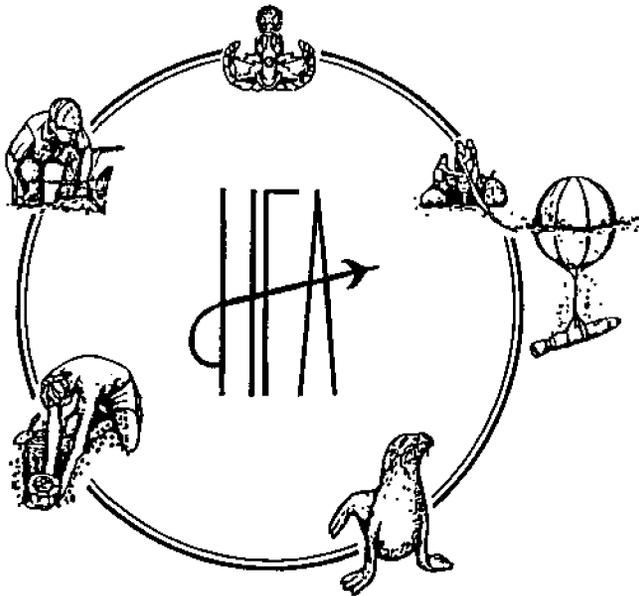
Satisfactorily Completed the

OSHA 40 - Hour Course

Hazardous Waste Worker

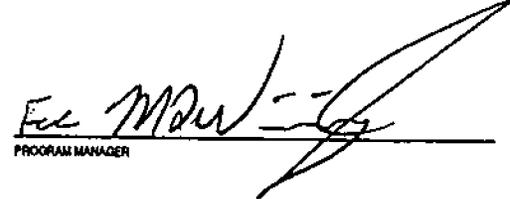
29 CFR 1910.120

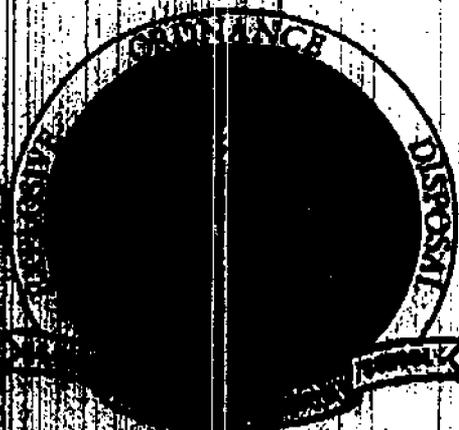
Presented by Human Factors Applications, Inc.



Dated this 5th Day of June 19 94


INSTRUCTOR


PROGRAM MANAGER



**Naval School
Explosive Ordnance Disposal
Certificate of Completion**

Presented To

**Staff Sergeant
David P. Coe, USAF**

**For having successfully completed
the prescribed course of study for**

EXPLOSIVE ORDNANCE DISPOSAL PHASE II

23 October 1979

Date

M. G. MATHIEWS, CDR, USN

Commanding Officer

ALAN E. JETT**UXO SUPERVISOR**DATE ATTENDED BASIC EOD SCHOOL: September 1980 - March 1981

EOD/UXO ASSIGNMENTS:

- Apr 81 - Jul 86 White Sands Missile Range NM. National Range Directorate, EOD Team Leader. Primarily worked on range operations. RSP and disposal of rockets, missiles and newly developed ordnance items.
- Jul 86 - Jul 91 149th Ordnance Detachment (EOD) - Andrews AFB, MD. Operations Sergeant. Primary duties - supporting the VIP mission.
- Aug 91 - Aug 92 1st US Army Support Battalion, Multinational Force & Observers Sinai Arab Republic of Egypt; Senior EOD Supervisor. Supervised the location, identification, removal and/or disposal of over 4500 pieces of battlefield ordnance.
- Sep 92 - Apr 93 17th Ordnance Detachment (EOD) Fort Campbell KY. EOD Operations NCO. Coordinated EOD support to 55 active firing ranges for the 101st Airborne Division (Air Assault) training ranges, this included the disposal of all types of Artillery munitions.
-
- Apr 93 - Present HFA, Inc. Contract DACA87-92-D-0133, UXO Specialist and UXO Supervisor, DO #16, Fort Sill, OK. Supervised 5 man clearance and demolition team.
- Aug 95 - Feb 96 UXO International, Inc. UXO Specialist/Supervisor, Motlow State College (formerly Camp Forrest), TN. QC Specialist, Kaho'olawe Island, HI, responsible for monitoring the requirements of the Site Specific Project Quality Control Plan. Compiled quality data from all UXO operations.



CERTIFICATE OF TRAINING

This Certifies That

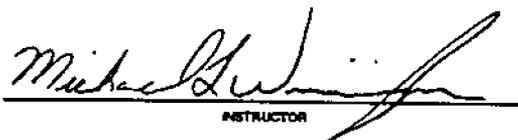
ALAN C. JETT

**Satisfactorily Completed the
OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training

This Certifies That

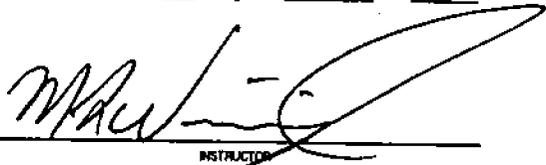
Alan Jett

***Satisfactorily Completed the
OSHA 8 - Hour Supervisor Course***

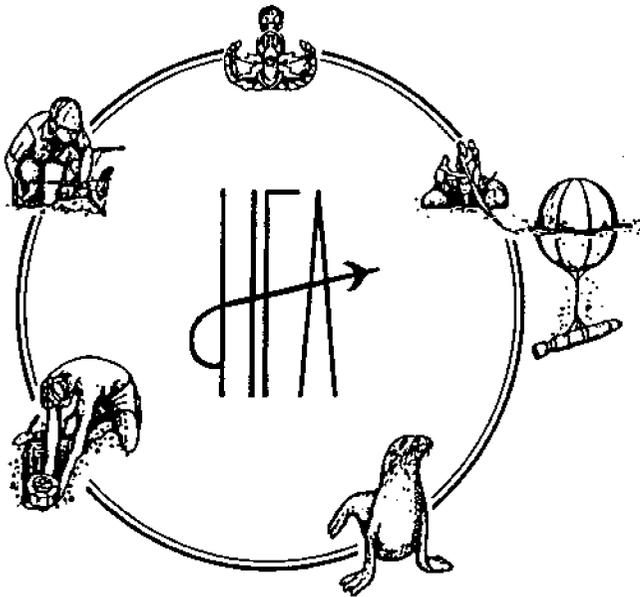
***Hazardous Waste Worker
29 CFR 1910.120***

Presented by Human Factors Applications, Inc.

Dated this 12th Day of June 9 94



INSTRUCTOR



Certificate of Training

This Certifies That

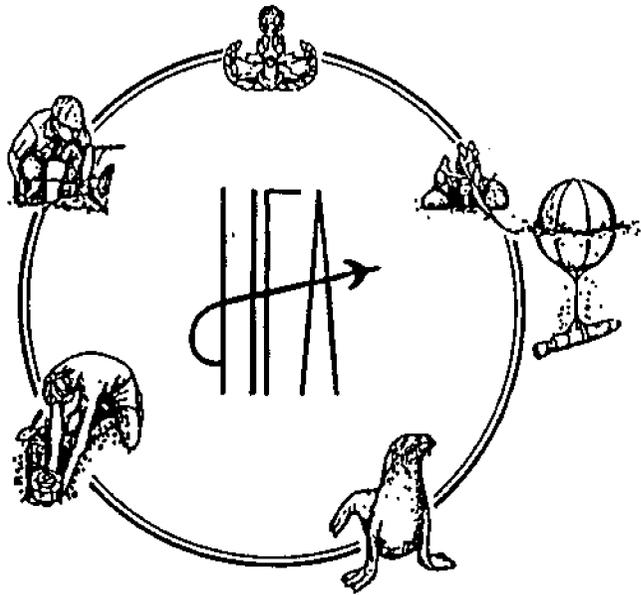
Alan E. Jett

Satisfactorily Completed the

OSHA 40 - Hour Course

**Hazardous Waste Site Worker
29 CFR 1910.120(E)**

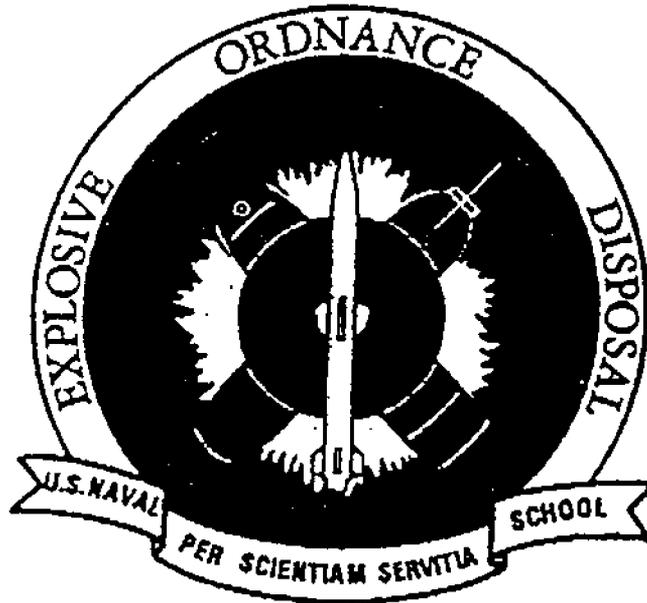
Presented by Human Factors Applications, Inc.



Dated this 30th Day of April 19 94

Michael B. ...
INSTRUCTOR

Naval School Explosive Ordnance Disposal



This certifies that

Sergeant Alan E. Jett, 316-52-9414, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL -
SURFACE PHASE

is awarded this
Certificate

this 23rd day of April, A.D. 1981

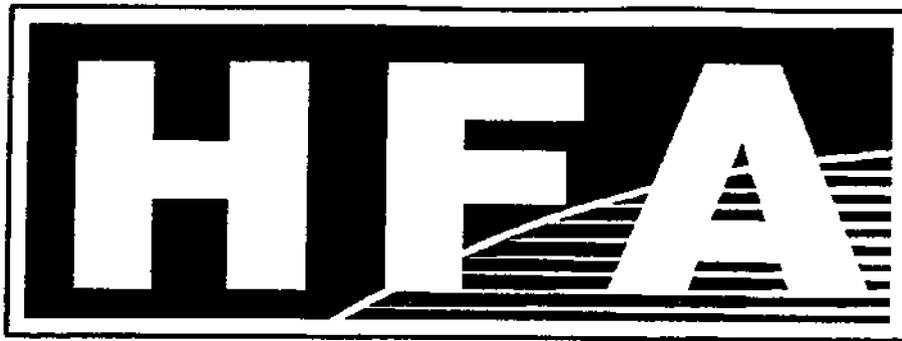
J. T. Kennedy
J. T. KENNEDY, CAPT, USN
COMMANDING OFFICER

JEFFREY M. SCHWALM**UXO SUPERVISOR**

DATE ATTENDED BASIC EOD SCHOOL: May - December 1975

EOD/UXO ASSIGNMENTS:

- Jan 76 - Jul 79 1st Special Operations Wing (EOD), Hurlburt Fld. FL. Supported two bombing ranges. Primarily Mk series iron bombs, air-to-air missiles (2.75, Aim 7) and small arms, as well as 20mm ammunition.
- Aug 79 - Nov 80 Team member, 7005th EOD Flight, Turkey. Performed TDY's throughout Europe in support of bombing range clearance. MK series iron bombs, smart bombs, air-to-air missiles and 20mm and 30mm cannons.
- Dec 80 - Sep 82 NCOIC EOD Branch, Mountain Home AFB, ID. Maintained a small range for the destruction of aircraft egress items as well as small arms and area defense weaponry.
- Sep 82 - Sep 85 7016 EOD Flight, England. NCOIC of Branch. Provided services to European locations in support of range clearances. Mk series iron bombs, fire bombs, cluster units, cannon systems and British artillery.
- Oct 85 - Mar 93 Superintendent EOD Unit, Nellis AFB, NV. Primary duty was support of the Nellis Gunnery and bombing ranges. Munitions encountered, MK series bombs, fire bombs, air-to-air missiles, cannon systems and many classified sub-munitions systems.
-
- Apr 93 - Aug 94 HFA, Inc. QC Specialist/ Site Safety Officer for the Fort Sill delivery order Number 0004 under contract number DACA87-92-D-0133.



CERTIFICATE OF TRAINING

This Certifies That

JEFFERY M. SCHWALM

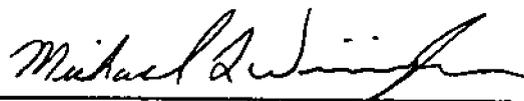
Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

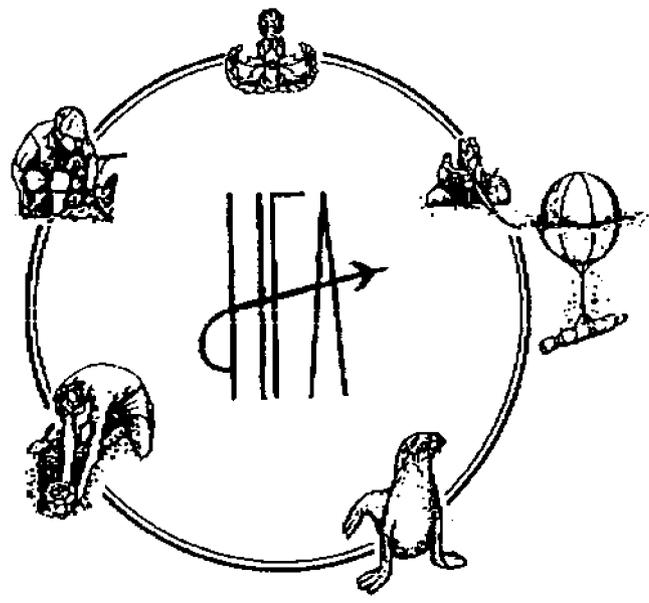
**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96



INSTRUCTOR



Certificate of Training

This Certifies That

Jeff Schwalm

Satisfactorily Completed the

OSHA 40 - Hour Course

Hazardous Waste Worker

29 CFR 1910.120

Presented by Human Factors Applications, Inc.

Dated this 12th Day of June 19 94

[Signature]
INSTRUCTOR

[Signature]
PROGRAM MANAGER

CAUTION: NOT TO BE USED FOR IDENTIFICATION PURPOSES

THIS IS AN IMPORTANT RECORD. SAFEGUARD IT.

ANY ALTERATIONS IN SHADED AREAS RENDER FORM VOID

CERTIFICATE OF RELEASE OR DISCHARGE FROM ACTIVE DUTY

1. NAME (Last, First, Middle) SCHWALM JEFFREY MARK		2. DEPARTMENT, COMPONENT AND BRANCH AIR FORCE--REG AF		3. SOCIAL SECURITY NO. 371 162 1412	
4.a. GRADE, RATE OR RANK MSGT		4.b. PAY GRADE E7		5. DATE OF BIRTH (YYMMDD) 1954 Jun 17	
7.a. PLACE OF ENTRY INTO ACTIVE DUTY Detroit MI			7.b. HOME OF RECORD AT TIME OF ENTRY (City and state, or complete address if known) Detroit MI		
8.a. LAST DUTY ASSIGNMENT AND MAJOR COMMAND 558 CES (ACC)			8.b. STATION WHERE SEPARATED Nellis AFB NV		
9. COMMAND TO WHICH TRANSFERRED NOT APPLICABLE				10. SGLI COVERAGE <input type="checkbox"/> None Amount: \$ 100,000	
11. PRIMARY SPECIALTY (List number, title and years and months in specialty. List additional specialty numbers and titles involving periods of one or more years.) 46490 - Explosive Ord Disposal Supt, 19 yrs 2 mths 46150 - Munitions Systems Spec1, 1 yr 2 mths Date Recorded <u>October 4, 1993</u> Number <u>9</u> Page <u>109</u> <i>mm [unclear] [unclear]</i>		12. RECORD OF SERVICE		Year(s)	Month(s)
		a. Date Entered AD This Period		1976	MAY
		b. Separation Date This Period		1993	Mar
		c. Net Active Service This Period		16	10
		d. Total Prior Active Service		03	06
		e. Total Prior Inactive Service		00	00
		f. Foreign Service		06	04
		g. Sea Service		00	00
h. Effective Date of Pay Grade		1987	Jun	01	
13. DECORATIONS, MEDALS, BADGES, CITATIONS AND CAMPAIGN RIBBONS AWARDED OR AUTHORIZED (All periods of service) Air Force Commendation Medal with 2 oak leaf clusters, Air Force Achievement Medal, Air Force Outstanding Unit Award with 5 oak leaf clusters, Air Force Good Conduct Medal with 5 oak leaf clusters, (SEE REMARKS)					
14. MILITARY EDUCATION (Course title, number of weeks, and month and year completed) Senior Noncommissioned Officer Academy, 8 weeks, Jan 92 by correspondence; Noncommissioned Officer Academy, 6 weeks, Sep 84; Noncommissioned Officer Leadership School, 30 days, Apr 82					
15.a. MEMBER CONTRIBUTED TO POST-VIETNAM ERA VETERANS' EDUCATIONAL ASSISTANCE PROGRAM		Yes	No	15.b. HIGH SCHOOL GRADUATE OR EQUIVALENT	
			XX	Yes	
				XX	
16. DAYS ACCRUED LEAVE PAID 0					
17. MEMBER WAS PROVIDED COMPLETE DENTAL EXAMINATION AND ALL APPROPRIATE DENTAL SERVICES AND TREATMENT WITHIN 90 DAYS PRIOR TO SEPARATION <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
18. REMARKS (ITEM 13 CONTINUED: National Defense Service Medal with 1 bronze service star, Southwest Asia Service Medal with 3 bronze service stars, Air Force Overseas Short Tour Ribbon with 1 oak leaf cluster, Air Force Overseas Long Tour Ribbon with 2 oak leaf clusters, Air Force Longevity Service Award Ribbon with 4 oak leaf clusters, USAF Noncommissioned Officer Professional Military Education Graduate Ribbon with 1 oak leaf cluster, Air Force Small Arms Expert Marksmanship Ribbon, Air Force Training Ribbon, Kuwait Liberation Medal. Member served 2 Aug 90 to 31 Mar 93 in support of Operation Desert SHIELD/STORM. Member served in Operation Desert SHIELD/STORM area of responsibility. Term of Current Enlistment: 4 years. Subject to recall to active duty by the Secretary of the Air Force. ---NOTHING FOLLOWS---					
19.a. MAILING ADDRESS AFTER SEPARATION (include Zip Code) 10426 Wolverine Rd Wolverine, MI 49799			19.b. NEAREST RELATIVE (Name and address - include Zip Code) DAVID W. SCHWALM, 12257 Vaughn Detroit MI 48228		
20. MEMBER REQUESTS COPY BE SENT TO <input checked="" type="checkbox"/> MI DIR. OF VET AFFAIRS <input type="checkbox"/> Yes <input type="checkbox"/> No			22. OFFICIAL AUTHORIZED TO SIGN (Typed name, grade, title and signature) ROSE F. GREENSPAN, GS-8, DAF Supt. Separations/Retirements		
21. SIGNATURE OF MEMBER BEING SEPARATED <i>Jeffrey Mark Schwalm</i>					

DD Form 214, NOV 88

Previous editions are obsolete.

MEMBER-1

RETIREMENT

HONORABLE

AFR 35-7

RBD

2V

VOLUNTARY RETIREMENT FOR YEARS OF SERVICE ESTABLISHED BY LAW

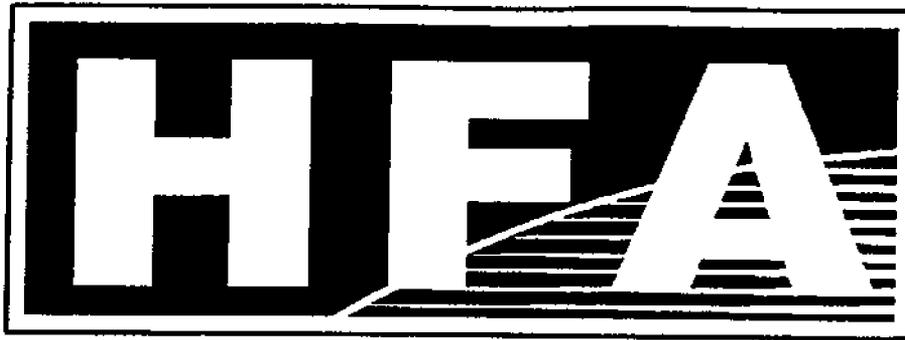
NONE

CHARLES E. CHAMBERS**UXO SPECIALIST**

DATE ATTENDED BASIC EOD SCHOOL: June 1980 - January 1981

EOD/UXO ASSIGNMENTS:

- Feb 81 - Jun 83 EOD Branch, Hill AFB, UT. Team Chief. Shelf life testing of the CBU-52,58 and 71. Supported Range clearance of primarily BLU-3 and BLU-7.
- Jul 83 - May 89 Hq USAFE and 7006 EOD Flight, Ramstein Germany. Cleared both German and American MK series iron bombs, air dropped cluster bombs, all series of 2.75 rockets, BLU-61 and 63 sub-munitions and a 155mm Artillery range.
- May 89 - Sep /91 EOD Branch, Eglin AFB, FL. Team Chief. Test and Development Air Force new systems such as Hellfire and Gator weapon systems. Range clearance, RSP's and disposal.
-
- Nov 91 - Mar 93 Lear Siegler, Inc., Brown & Root, and ECC. Duties included clearance activities. MLRS, landmines, LAWS, TOWS, 4.2 and 81mm mortars, 105 and 155mm Projectiles and 2.75" rockets. Saudi Arabia, Desert Storm clean up and San Diego, CA.
- Mar 93 - Present HFA, Inc. UXO Supervisor, Contract DACA87-92-D-0133, DO #04, Fort Sill, OK.



CERTIFICATE OF TRAINING

This Certifies That

CHARLES E. CHAMBERS

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training



this certifies that

Charles Chambers

has completed the requirements for
8 Hour Site Supervisor Training
In accordance with OSHA 29 CFR 1910.120 (e)(4)

Stuart E. Lane 7/13/95
Certifying Official Date

Certificate of Training

This Certifies That

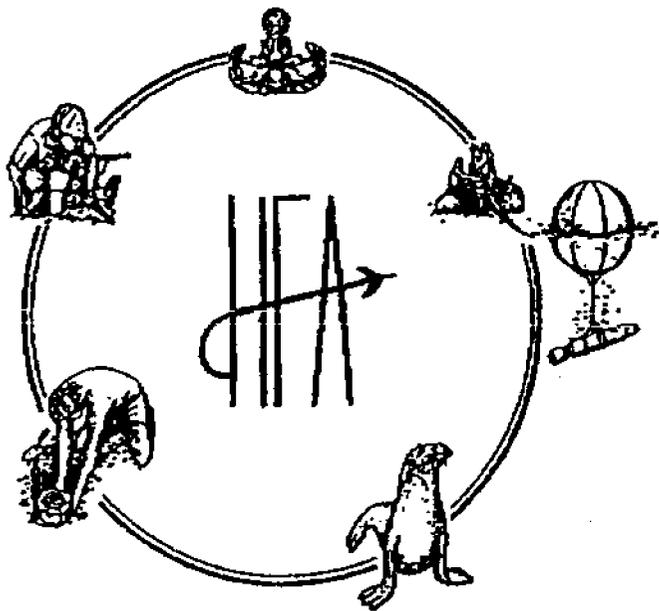
Charlie Chambers

Satisfactorily Completed the

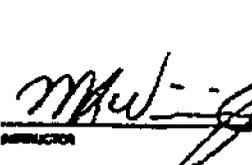
OSHA 40 - Hour Course

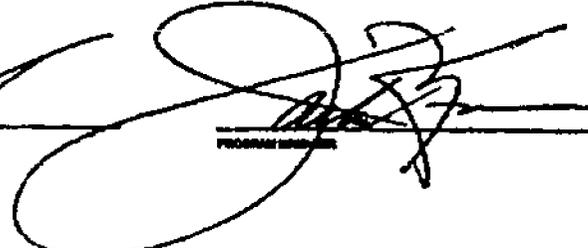
**Hazardous Waste Worker
29 CFR 1910.120**

Presented by Human Factors Applications, Inc.



Dated this 12th Day of June 19 94


INSTRUCTOR


PROGRAM MANAGER

PHYSICIAN'S STATEMENT

FOR APPLICANT OR EMPLOYEE OF UXB INTERNATIONAL, INC.

NAME : Charles Chambers

DATE OF EXAM : 3/20/96

TYPE OF EXAM (pre-employment annual or other) : _____

DATE OF BIRTH : 10-6-51 SOCIAL SECURITY NO. : 355-46-7665

The individual named above has :

1.) Undergone a physical examination per OSHA (29 CFR 1910.120) and has been found medically :

- qualified for hazardous site work
- not qualified for hazardous site work*

2.) Undergone a physical examination per OSHA (29 CFR 1910.134 (b) (10)) and has been found medically :

- qualified to use respiratory equipment
- not qualified to use respiratory equipment*

Physician's Signature : [Signature]

Printed Name of Physician : CURTIS LICKER

Address : _____

Phone Number : _____

Physician's State License Number : 1707

Copies of test results are maintained and available at : _____

OSHA 1910.120 states that persons should not be assigned to tasks requiring the use of respiratory equipment unless it has been determined that they are physically able to perform the work and use the equipment safely.

- The physician should append his report detailing the reasons for this opinion.

Naval School Explosive Ordnance Disposal



This certifies that

Technical Sergeant Charles E. Chambers, 355-46-7665, USAF

having successfully completed
the prescribed course of study for
EXPLOSIVE ORDNANCE DISPOSAL SPECIALIST -
GSABN46430

is awarded this
Certificate

this 13th day of February A.D. 1981
J. T. Kennedy, CAPT, USN
COMMANDING OFFICER

STEPHEN C. VOLAND UXO SPECIALIST

DATE ATTENDED BASIC EOD SCHOOL: June - December 1985

EOD/UXO ASSIGNMENTS:

- Dec 85 - Jun 87 63rd Ordnance Detachment (EOD), Ft. Leonard Wood, Missouri. Worked as an EOD Specialist for the State of Missouri and the southern half of Iowa. Involved with four range clearances in these areas.
- Jun 87 - Aug 91 50th Ordnance Detachment (EOD), Charles Melvin Price Support Center, Granite City, Illinois. Promoted to EOD Team Leader ultimately supervising eight EOD Specialists during operations for the entire mid-west with emphasis on special improvised explosive devices and Nuclear Emergency Search Team support.
- Aug 91 - Aug 92 8th Ordnance Detachment (EOD), Camp Red Cloud, South Korea. EOD Team Leader supervising six EOD Specialists and 15 support personnel performing detection, identification, and render safe of explosive ordnance items in the entire country.
- Sep 92 - Sep 93 41st Ordnance Detachment (EOD), Ft. Bliss, Texas. EOD Team Leader in charge of six EOD Specialists, responsible for the detection, identification, and render safe of explosive ordnance items in West Texas and the state of New Mexico, with temporary duty in Kuwait.
-
- Oct 93 - Present HFA, Inc. UXO Specialist on various projects including Ft. Sill and Pueblo. UXO Supervisor for Ft. Devens, MA OE Sampling Action and Bureau of Prisons OE Removal Action under Contract DACA87-94-D-0019.

MEMORANDUM

Post-It® Fax Note	7671	Date	8-30	# of pages	2
To	DICK	From	DAVE		
Co./Dept.		Co.			
Phone #		Phone #			
Fax #		Fax #			

Date: August 30, 1995

From: Dave Frandsen, SUXOS, for the Ft Devens, Ma. UXO Project

To: Randy Harris, On Site CE/IND Safety Specialist for the Ft Devens, Ma. UXO Project

Subj: Steve Voland, promotion to UXO Supervisor

1. Request approval of Steven Voland to the position of UXO Supervisor effective. September 6, 1995.

Approved Randy Harris this date 30 Sep 95

PLEASE ASK
MIKE TO
SEND 8 HR

SUP CERT

THANKS

Dave



CERTIFICATE OF TRAINING

This Certifies That

STEVE C. BOLAND

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

**ENVIRONMENTAL
Training Center**

CERTIFIES THAT

STEPHEN C. VOLAND

has successfully completed

40 HOUR INITIAL HEALTH & SAFETY TRAINING PER 29 CFR 1910.120 FOR

HAZARDOUS WASTE SITE OPERATIONS

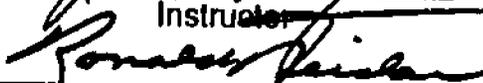
SSN 257-39-8107

Course date OCTOBER 4 to 8, 1993

Requirement 29 CFR 1910.120

Certificate No. 7-SL100493-08

Training Site: 1988 INNERBELT BUSINESS CTR. DR.
ST. LOUIS, MISSOURI 63114-5760
TELEPHONE 314/428-7020


Instructor

Director, Training

National Registry of Emergency Medical TechniciansSM

Hereby certifies

STEPHEN C. VOLAND

as an

Emergency Medical Technician - Basic

duly registered together with all the rights, and privileges appertaining thereto in consideration of the satisfactory completion of the prescribed educational and clinical requirements.

In Testimony Whereof, the seal of the National Registry of Emergency Medical Technicians and the signatures as authorized by the Board of Directors are hereunto affixed.

this 18th day of May, 19 91 A.D.



Chairman of the Board



Executive Director

ENVIRONMENTAL
Training Center

CERTIFIES THAT

STEPHEN C. VOLAND

has successfully completed

40 HOUR INITIAL HEALTH & SAFETY TRAINING PER 29 CFR 1910.120 FOR

HAZARDOUS WASTE SITE OPERATIONS

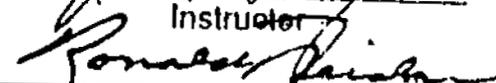
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Certificate No. 7-SL100493-08

Training Site: 1988 INNERBELT BUSINESS CTR. DR.
ST. LOUIS, MISSOURI 63114-5760
TELEPHONE 314/428-7020


Instructor

Director, Training

Cardiopulmonary
Resuscitation and
Emergency
Cardiac Care
Provider



STEVE C. Voland

has successfully completed the national cognitive and skills evaluations
in accordance with the curriculum of the American Heart Association for

BLS-C

7/95

Date of Issue

7/97

Recommended Renewal Date

304 NY09180 35-01-10

**Deaconess - Nashoba Hospital
Occupational Health Department
(508) 772-0200 x328**

NOTE TO EMPLOYER:

COMPANY: Human Factor Applications DATE: 6.15.95

Your employee, Stephen Veland was seen
on 6/15/95 for:

- Pre-employment Examination
- Return to Work
- Annual or Special Examination

FINDINGS: _____

RECOMMENDATIONS:

	YES	NO
Medically qualified for job	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examinee advised of positive finding	<input type="checkbox"/>	<input type="checkbox"/>
Examinee referred to personal physician	<input type="checkbox"/>	<input type="checkbox"/>

Dr. _____ was notified on _____

by: _____


**James Barzun, M.D.
Medical Director, Occupational Health**

Naval School Explosive Ordnance Disposal



This certifies that

Specialist Four
Stephen C. Voland, USA
257-39-8107

having successfully completed
the prescribed course of study for

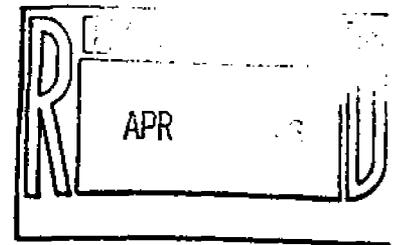
BASIC EXPLOSIVE ORDNANCE DISPOSAL - SURFACE/NUCLEAR PHASES

is awarded this
Certificate

this 3rd day of June A.D. 1988

W.A. Murray, CD, USN
COMMANDING OFFICER

JEFFREY M. HOLM
UXO SPECIALIST



Civilian UXO Experience:

- Jan 96-Present: UXO Specialist, CMS Environmental, Eaker AFB, BRAC Project. Sub surface clearance to three feet of Explosive Ordnance Disposal area. Backhoe operator.
- Jan 92-Mar 93: UXO Specialist, EODWSI, Kuwait. Located, identified and disposed of ordnance on battlefield areas, ASP's, military installations and an active airport. Conducted battlefield hazard surveys and hazard zone mapping using GPS equipment.

Military EOD Experience:

- Aug 90-Mar 91: EOD Team Leader, 363 TFW (Deployed) Al Dhafra AB, UAE. Deployed in Operation Desert Shield/Storm. Provided EOD support for combat flying operations, plus clearance on the Multi-National Forces range.
- Oct 89-Sep 91: EOD Team Leader, 31 ABOS, Homestead AFB, FL. Supervised several US Secret Service support, range clearance and disposal operations at Avon Park Bombing and Gunnery range.
- Oct 88-Oct 89: EOD Team Leader, 8 CSG, Kunsan AB, ROK. Planned and conducted bomb detection and area sterilization for the US Secret Service. Supervised many range clearance and disposal operations on Nightmare, Rodriguez, Satcheon and Chickdo ranges in the ROK.
- Sep 84-Oct 88: EOD Team Leader/Technician, 3246 MMS, Eglin AFB, FL. Planned and conducted the location, identification, and disposal of test Bombs, CBU, Missiles, Rockets, Mines and Gun ammunition. Developed and wrote EOD procedures to support Armament Division missions. Assisted in test data collection and analysis of malfunctioned munitions during numerous projects, involving both standard and non-standard ordnance. Operated and maintained the remote controlled fleet of vehicles at Eglin AFB. Performed initial response and subsequent clean up of hazardous materials found at a local abandoned warehouse. Supervised numerous range clearance and disposal operations on the Eglin range complex.
- Jun 83-Sep 84: EOD Technician, 8 EMS, Kunsan AB, ROK. Assisted in joint disposal operations involving U.S. and Korean forces on many ranges in the ROK.
- Oct 81-Jun 83: EOD Technician, 2701 EODS, Hill AFB, UT. Member of Worldwide Response Team for nuclear, chemical and biological explosive accidents for all Air Commands. Performed numerous range clearance and disposal operations on the Utah Test and Training ranges.

Date attended Basic EOD School: Mar 81-Oct 81
OSHA Hazardous Materials, 40 hours: 1995
OSHA Hazardous Materials Supervisor: 1995



CERTIFICATE OF TRAINING

This Certifies That

JEFFERY M. HOLM

Satisfactorily Completed the

**OSHA 40- Hour Hazardous Waste Site Worker
and Emergency Response Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(1)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR



GREANEY MEDICAL GROUP
OCCUPATIONAL MEDICINE
ENVIRONMENTAL HEALTH
TOXICOLOGY

Participant Name: Jeffrey M. Holm Date of Exam: 12/20/95

Company Name: CMS, Inc.

Recently you had a medical examination in our office in accordance with OSHA regulations for workers exposed to hazardous waste (29 CFR 1910.120) and for the use of respiratory protective equipment (29 CFR 1910.134) or for other purposes. The results of this examination follow:

Medical history: Normal Abnormal

Physical examination: Normal Abnormal

Chest X-ray: No active disease Abnormal Not indicated

Breathing tests: Normal Abnormal

Laboratory Tests: Normal Abnormal

EKG: Normal Abnormal Not indicated

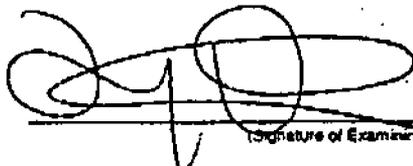
Other Comments:

Drug Screen Negative

- Your examination was normal.
- The abnormalities noted above should be followed up with your personal physician. Copies of your medical record will be furnished upon your signed request.
- The abnormalities noted above have resulted in restrictions in your work duties or in your use of personal protective equipment as described in the accompanying Medical Evaluation Form.

If you have any questions, please do not hesitate to call me.

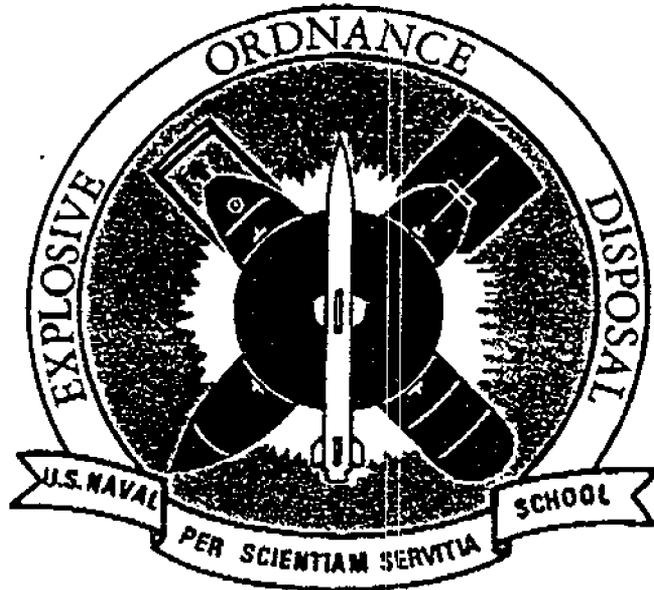
Name of physician: Werry Chen MD
(please print)


(Signature of Examining Physician)

Address: GMG Workcare
333 S. Anita Dr., Ste. 630
Orange, CA 92668

12/27/95
(Date)

Naval School Explosive Ordnance Disposal



This certifies that

Airman First Class
Jeffrey M. Holm, 225-64-4078, USAF

having successfully completed
the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL SPECIALIST - G5ABN46430

is awarded this
Certificate

this 23rd day of October AB 1961
James C. Blanton
JAMES C. BLANTON, CDR, USN
COMMANDING OFFICER

PDS CODE: CID

George L. Frazer

UXO SPECIALIST

Objective:

A position in the explosives/demolition field where I can fully utilize my vast knowledge and experience.

Employment History:

6/94 - Present Environmental Chemical Corporation; San Diego, CA
Duties include subsurface clearance of Mission Trails removing projectiles.

8/92 - 3/93 *EOD Advisor* to Saudi Air Force.

8/88 - 7/89 *EOD Superintendent*; Mt. Home, Idaho
Responsible for EOD shop and the clearance of Sailor Creek range.

8/86 - 8/88 *Commander EOD Flight*; Spain
Responsible for all EOD operations in Spain. Worked Bardinas Relas range.

8/85 - 8/86 *EOD Superintendent*; Aviano Italy
Responsible for EOD shop.

8/83 - 8/85 *TAC IG Team*; Langley Air Force Base
Inspected EOD, munitions, weapons, safety and mobility

5/82 - 8/83 *EOD Branch Chief*; Langley Air Force Base (Wing)
Responsible for all EOD operations -- destroyed over 750,000 Pounds of ammunition.

4/81 - 4/82 *EOD Technician*; Incerlick, Turkey
Supported movement of Nike Hercules missiles.

5/78 - 3/81 *EOD Technician*; Luke Air Force Base, Arizona
Crew Chief on 25 man range clearance crew. Involved in four aircraft crashes. Destroyed over 300,000 pounds of ordinance

4/75 - 4/78 *EOD Specialist*; Aviano, Italy
Duties included ammunition disposal and working the Aviano range.

1/74 - 3/75 *EOD Specialist*; Kingsley Field, Oregon
Performed ammunition disposals and worked with the local sheriff.

3/72 - 12/73 *EOD Specialist*; Dover Air Force Base
Performed munitions duties.

Experience:

- 17 1/2 years EOD experience.
- 13 years as a supervisor.
- Branch Chief of three EOD shops.
- Commander EOD flight in Europe.
- Two years TAC IG inspecting EOD, munitions, weapons, safety and mobility.
- 7 months EOD Advisor to Saudi Air Force.

Education:

40 hour HAZMAT - 1/95
Advanced Access 2nd Disamblment - 7/85
Advanced Nuclear School - 9/83
EOD School - 3/72
EOD refresher 3 times
Munitions School - 3/68



CERTIFICATE OF TRAINING

This Certifies That

GEORGE L. FRAZER

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96

INSTRUCTOR

Certificate of Training

Environmental Chemical
Corporation

Certifies that

George L. Frazer III

has successfully completed

Hazardous Waste Operations and Emergency Response
8 Hour Supervisor's Course
on 01 September 95

Certificate #SC0020SD

David P. Healy
Instructor

Certificate of Training

Environmental Chemical
Corporation

*proudly presents this award for
academic achievement to*

George L. Frazer

for satisfactorily completing the course for

**Hazardous Waste Operations
and Emergency Response**

40 Hour OSHA 29CFR 1910.120

4 February 1995



Instructor





**Naval School
Explosive Ordnance Disposal
Certificate of Completion
*Presented To***

TSGT GEORGE L. FRAZER III, USAF

***For having successfully completed
the prescribed course of study for***

***EXPLOSIVE ORDNANCE DISPOSAL
PHASE I AND II - SURFACE***

17 MAR 1972

Date

J. R. LAKE, CDR, USN

Commanding Officer

JAMES M. LEONARD
UXO TECHNICIAN

Years of Civilian UXO Experience: 4 years

CIVILIAN UXO EXPERIENCE:

- 01/96-Present UXO Specialist Eaker AFB, locate identify and remove magnetic anomalies
- 10/95-Present Training Specialist - Instructor for OSHA and Bomb Threat classes - write proposals for future contracts.
- 8/95 - 10/95 Performed as EOD Technician at Ft Irwin, CA - responsible for locating, identifying and destroying unexploded ordnance
- 7/94- 8/95 Performed as UXO Supervisor- Responsible for the day to day operations of sweep team at Ft. Ord., CA-Complete documentation to substantiate area cleared. Perform UXO/OEW excavations. Perform statistical sampling. Perform UXO intrusive. Perform explosive reconnaissance. Conducted soil sifting operations for UXO/OEW. Supervised air monitoring operations. Ensure compliance with all safety regulations. Perform escort duties
- 9/93 - 5/94 Performed as a UXO Specialist for UXB International, Inc. Conduct ordnance sweeps, downhole geophysics, escort duties. Encountered small arms ammunition, explosive projectiles, electro-explosive devices and mortars. Conduct soil sampling operations. Locate, identify and remove magnetic anomalies in support of Operation Safe Removal, Washington D.C.. Perform duties as Site Safety Officer Performed UXO operations in Level "B" and Level "C" PPE.
- 12/91-4/93 Explosive Ordnance Disposal Operations, Kuwait. Initial survey identification of ordnance and level of contamination in the U.S. sector of operations. Clearance of Al-Jaber Air Base-identification and disposal of dispensed munitions and magazine areas. Minefield operations - locate, identify, neutralize and disposal of 90 miles of deliberate minefields, ASP clean up.

Years of Military Experience: 12 years, 11 months

MILITARY EOD EXPERIENCE:

- 6/84 - 6/91 Naval Explosive Ordnance Disposal School, Eglin Air Force Base, Florida, Instructor. Develop curriculum for basic explosive ordnance disposal students. Range safety supervisor. Instruct classes in demolition procedures. Explosive Ordnance Disposal Division, Redstone Arsenal, Alabama. Certified instructor in the following areas: Identification and safety of U.S. and foreign ordnance, identification and disposal of toxic chemicals, biological agents and radioactive materials.
- 5/81 - 5/84 Assigned to Explosive Ordnance Disposal Section, Berlin Brigade, Berlin, Germany. Non-Commissioned Officer in charge of the section. Supervised the day-to-day operations, responded to over 300 incidents involving unexploded ordnance and suspicious packages. Participated in the planning and execution of two counter terrorist exercises

7/78 - 5/81 Stewart Army Sub-Post, Newburg, New York, EOD Specialist and Team Leader. Responded to 29 incidents, including the destruction of commercial dynamite, and 3 home-made bombs. Participated in 2 range clearances, spent numerous hours in support of the United States Secret Service and Department of State protecting the President of the United States and other dignitaries. Fort Bliss, Texas. Responded to incidents involving unexploded ordnance and oil field explosives. Participated in 2 major operations involving the destruction of over 5 tons of ammunition and a range clearance at Fort Hood, Texas.

MILITARY EOD EDUCATION

EOD School, Basic 6/78

EOD School, Nuclear 7/80

CIVILIAN EDUCATION

Confined Space 29 CFR 1910.146 12/95

8 Hour Refresher Course 29 CFR 1910.120 12/95

8 Hour Supervisor Course 29 CFR 1910.120(e) (4) 12/95

40 Hour Hazardous Substance Health and Safety 9/93

CPR Certified 9/93

BA Degree Sociology, William Paterson College 5/76



CERTIFICATE OF TRAINING

This Certifies That

JAMES M. LEONARD

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

University of North Florida
DIVISION OF CONTINUING EDUCATION & EXTENSION
and the
ENVIRONMENTAL EDUCATION & SAFETY INSTITUTE

Training provided by University of North Florida • 4567 St. Johns Bluff Road, South
Jacksonville, Florida 32216 • (904) 646-2690

Certify that

JAMES LEONARD

has successfully completed the certificate requirements for

40-HOUR HAZARDOUS SUBSTANCE HEALTH AND SAFETY
and in evidence thereof is awarded this

Certificate of Completion

on the 20th day of SEPTEMBER, 1993

Marcelle C. Lovett

MARCELLE C. LOVETT
Dean

Elaine Puri

ELAINE PURI
Program Coordinator

James E. Kelley

JAMES E. KELLEY
Director

PASSED EXAM: 09/17/93 ACCREDITATION EXPIRES: 09/17/94 Certificate No. 3772

PHYSICIAN'S STATEMENT

(Includes diving clearance)

FOR APPLICANT OR EMPLOYEE OF UXB INTERNATIONAL, INC.

NAME: James Leonard

DATE OF EXAM: 3 Aug 95

TYPE OF EXAM (pre-employment, annual, or other): annual

DATE OF BIRTH: 28 Jul 51 SOCIAL SECURITY NO.: 139-38-9176

The individual named above has :

1.) Undergone a physical examination per OSHA [29 CFR 1910.120] and has been found medically :

- qualified for hazardous site work
- not qualified for hazardous site work*

2.) Undergone a physical examination per OSHA [29 CFR 1910.134 (b) (10)] and has been found medically :

- qualified to use respiratory equipment
- not qualified to use respiratory equipment*

3.) Undergone a physical examination per OSHA [29 CFR 1910, subpart t., EM 385 1.1, and U.S. Navy Diving Manual, NAVSEA 0994-LP-001-9010] and been found medically :

- qualified to perform surface supplied/ SCUBA diving operations to 130 feet(salt water)
- not qualified to perform surface supplied/ SCUBA diving operations

Physician's Signature: J. D' Ambrosio

Printed Name of Physician: BERTO D'AMBROSIO, MD

Address: Doctors On Duty

Phone Number: 772-6707 1001 S. Fremont

Physician's State License Number: Monterey, CA 93940: e42403

Copies of test results are maintained and available at :

Address

OSHA 1910.120 states that persons should not be assigned to tasks requiring the use of respiratory equipment unless it has been determined that they are physically able to perform the work and use the equipment safely.
* The physician should append his report detailing the reasons for this opinion.

Naval School Explosive Ordnance Disposal



This certifies that

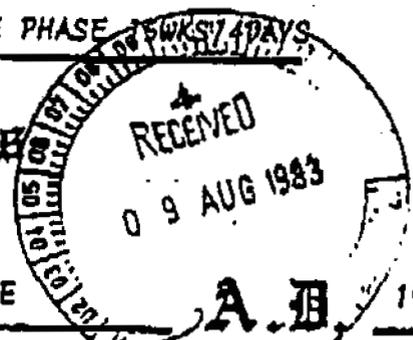
SPECIALIST FOUR JAMES M. LEONARD, 139-38-9176, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL - SURFACE PHASE 7 WEEKS / 14 DAYS

is awarded this
Certificate

this 8TH day of JUNE A.B. 1978

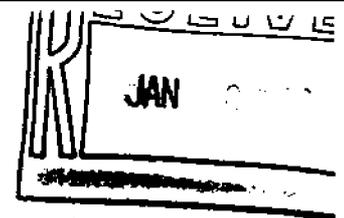


J. T. KENNEDY, CDR, USN
COMMANDING OFFICER

THIS DOCUMENT USED FOR AWARD OF
PROMOTION POINTS DO NOT
REMOVE

John B. Grace

UXO SPECIALIST



21 Years of Military Demolition & E.O.D. Experience

11 Years of Civilian UXO and Demolition Related Experience

Sept.1987-Jan.96 As owner of Graceline Improvement. Responsible for all job related planning, budget, buying, construction, and public relations as well as training employees during contract job work. Graceline is a Improvement Co. specializing in commercial and residential construction and renovation dealing with basic layout of jobs including carpentry, electrical, plumbing, roofing, masonry, interior and exterior spray and painting as well as landscaping.

Types of construction done:

9 years Columbia, S.C.

Residential homes of brick, logs, frame.

Swimming pools, vinyl, gunite, block.

Commercial buildings, steel, concrete, glass construction.

Industrial blasting work, roadways, ditches, rock quarry operations.

Mar. 1980-Sept.1986 Divex, Inc. P.O. Box 3131, Columbia, S.C. This work experience was as needed for an Explosive Technician on call. These job requirements were to render disposal services to Department of Defence, state and local county departments under contract, as well as commercial contractors requiring these services. These services were provided over a number of years, on a part-time bases. As I also operated my own construction company, Graceline Improvements, which was an on-going operation. Divex employed me in the transportation and disposal of explosive, and toxic material, as well as chemical and medical toxic waste materials.

Also during this period general industrial blasting and ditching were conducted. Rock quarry operations and highway construction were undertaken as well as some demolition of bridge and highway structures. These services were provided in South Carolina, North Carolina, Georgia, and Alabama.

Mar.1978-Mar.1980 This period saw operations of Graceline Improvement Company, Columbia, South Carolina dealing with contracts specializing in Interior and Exterior commercial and residential renovation including, carpentry, electrical, plumbing, spray and trim brush painting as well as basic frame building construction. Construction of commercial and residential swimming pools. (Note: during this time on as needed bases I conducted construction related blasting of roadways, and foundations work as well as swimming pool hopper excavations.

Mar. 1977-Feb.1978 Cherry Point, North Carolina, 2nd Marine Air Wing. Was designated as the Air Ordnance Safety Inspector for the Marine Air Operations. As Aircraft Ordnance Safety Inspector. Duties included coordination for writing, staffing and publishing ordnance safety regulations and orders and criteria for accident reporting as well as conducting inspection throughout the 2nd MAW as well as MCAS Beaufort, S.C. and New River, N.C. During this period the office of ordnance standardization and safety was

implemented.

Dec. 1975-Mar. 1977 Joint EOD Teams MCAS Cherry Point, N.C. NCOIC Combined EOD Teams.

Duties included coordination of (24) joint explosive EOD Operations, NCOIC of Combined EOD Teams. Dealing with explosive operations, security of classified material general administration and logistics mainly in areas of ammunition and explosive ordnance disposal. NCOIC of Ordnance Installations and Security and maintenance of hanger buildings. Planning of (1) joint East Coast Marine EOD disposal range and construction of these facilities at Cherry Point, N.C. Chief Instructor to local, state, and federal law enforcement dealing with homemade and clandestine devices (IEDS). Designed and fabricated experimental tools and equipment for safe disposal of explosive devices.

Nov. 1972-Dec. 1975 NCOIC Inspector Instructor of the 4th Reserve EOD Platoon, Columbia, S.C.

This duty included training of EOD platoon and ammunition Company, NCOIC of Motor Transport section, Unit Armory, Weapons instructor, Field recruiter Training Dept., Unit public relations Officer, Maintenance of buildings and grounds.

During my tour planning and construction of reserve facilities at Fort Jackson were undertaken and much of the actual construction was done by unit personal under my direction. During this duty tour the EOD platoon performed training, conducting range sweep and disposal operations at Fort Jackson, S.C., Vieques Island P.R. and Fort Gordon, Georgia. This unit was trained and supervised in ordnance of foreign and U.S. origin, to include sub-munitions, artillery, rockets, bombs, missiles and cannon ordnance as well as procedures for range sweep and disposal procedures.

During this time the reserve platoon, during live operations found and identified 9208 individual UXO items for disposal.

Mar. 1972-Nov. 1972 3rd EOD Platoon, Okinawa, Japan. Assistant EOD Platoon NCOIC. Was assigned as Range Disposal NCOIC for operation coordination, small arms burns and explosive destruction of Japanese and US Ordnance found on the island. Did Disposal of Grade III, supported daily requirements for ranges and deploying Marine units. Supported Japanese and other service military in range sweeps and training gave ordnance instruction to construction contractors. Deployed to Viet Nam waters with 2nd Bn-9th Marines off USS Sumter to Northern I-Corp area during the Easter offensive by the Army of North Viet Nam and was attached in support of the 7th South Vietnamese Marine Bn. at the My Chanh River counter offensive landings in Northern I-Corp. During April, May and June 1972 encountered foreign and U.S. ordnance to include missiles and rockets, heavy artillery as well as US Tow Missiles and heavy U.S. Naval projectiles.

Nov. 1971-Mar. 1972 Attached to Marine Corps Base Quantico, Virginia. EOD Team member participated in large scale range clearance operations, as well as routine EOD calls. Conducted Ordnance inerting of old and new U.S. items to include bombs, rockets, artillery, missiles. Presented classes on Terrorism and IED package items to Law Enforcement, conducted large grade III ordnance disposal operations.

Apr. 1971-Nov. 1971 Assistant NCOIC 3rd EOD Platoon Okinawa, Japan. Attached to Range Company Camp Fuji, Japan.

Planned and Supervised and conducted unexploded range clearance operations on Mount Fuji, and Okinawa Ranges. Did coordination of EOD support to Japanese local and Military units as well as disposal of large amounts of U.S. and Japanese sub-munitions Artillery, rockets, bombs, missiles and cannon ordnance, Burned small arms ammunition.

May 1970-Apr. 1971 Explosive and Ordnance Disposal School, Indian Head, Maryland, Instructor, Clandestine destructive devices/IED's for Refresher Students, Army, Navy, Air Force, Marine, and Federal Law Enforcement.

Responsible for developing field demonstrations, wrote procedure for bomb scare incidents, formulated programs of instruction and procedural new means of dealing with IED's and hazardous device disposal.

Jan. 1970-May 1970 Worked with Naval Investigative Service, Washington D.C. office, during the Washington D.C. anti-war demonstrations. At the request of NIS conducted technical assistance and wrote explosive device reports and evaluations and assessments for disposal of suspect items found in the Bethesda National Medical Center Hospital Bomb Shelter.

Naval medical personnel were responsible for these fabrications of incendiary devices (Note: I currently was a patient undergoing treatment at NNMCC, Bethesda, Maryland and was requested to render Technical Assistance by Capt. Rembish, EODF, Indian Head, Maryland

Feb. 1968-Jan. 1970 NCOIC, MCAS Cherry Point, North Carolina, SOES. Responded to all aircraft emergencies and crashes. Did disposal of air and ground ordnance as well as chemical munitions. Conducted large scale range clearance operations as joint EOD projects at Camp LeJeune and Fort Bragg, North Carolina. Did coordination of joint Nuclear Weapons Transportation and Training, Inventory Control of Classified Publications, Assisted the ATF Division in developing instruction and field demonstrations at EOD Range Cherry Point, North Carolina in bomb scare incidents, 11 Class's of ATF and other law enforcement officers, Eastern U.S. areas attended. Conducted destruction of Naval Ordnance and sea mines, and rockets, in Eastern U.S. waters. Assisted Naval EOD detachments in large scale disposal operations in inland waters.

Mar. 1967-Jan. 1968 EOD Platoon, Ammo Company. Force Logistic Command FMFPac deployed to RVN, DeNang. EOD Technician ground platoon. Encountered large amounts of foreign and US land mines, mortar, rockets, artillery ammunition, grenades, bombs, missiles, sub-munitions and water mines on a daily basis. Conducted ammo dump clearance after large fires and destruction of storage areas. Made very large disposal shots in different clean operations, DeNang Phu Bai, Dong Ha, Khe Sanh, Con Thien. Assisted the 1st Marine Air Craft wing on a as-needed basis, responding to aircraft emergencies and off-base crashes.

Mar. 1966-Mar.1967 EOD Platoon, Ammo Company 2nd FSR Camp LeJeune, North Carolina. EOD Technician conducted EOD Disposal Operations on all live fire ranges. Participated in large grade III disposal shots, large scale range clearance. Encountered a very wide range of munitions of both ground and air types. Conducted training and disposal operations with Engineer Demo teams, while deployed with 2nd MarDiv units in North African mine clearance operations, encountering U.S. as well as French, German,

British and Italian mines and munitions, as well as range clearance of old British training ranges in Libya, encountering a wide range of new and WWI, and WWII ordnance.

Apr. 1965-Mar. 1966 Attended Basic EOD School.
U.S. Naval School Underwater swimmers, Key West, Florida.
U.S. Army Chemical School, Fort McClellan, Alabama.
U.S. Naval School Explosive Ordnance Disposal, Indian Head, Md. Advanced EOD Refresher Oct. 1968, May 1971, March 1976

Nov. 1963-Apr. 1965 Assigned as Combat Engineer (MOS 1371) to Marine Barracks, Key West Florida. Demolition Team Leader for destruction of weapons and explosive and equipment. This material was residue of Combat Loads on American ships not needed or used in the unsuccessful Cuban operations, encountered WW-I and WW-II ordnance as well as bulk explosives and equipment used for blasting and demolition, some foreign ordnance was encountered.

Nov. 1962-Nov. 1963 Co.B 2nd Eng.Bn, Camp LeJeune, North Carolina. Assigned to a joint service construction project of U.S. Army, USMC, mine field clearance at Ft. Stewart, Georgia. This project encountered many types of U.S. mines in variance with standard placement and were either blown in place or removed.

Dec. 1960-Nov. 1962 Co.A 3rd Pioneer Bn, 3rd Marine Div, Okinawa. Was assigned to Demo Team, as Combat Engineer. During operations in the Philippine Islands during destruction of WWII fortifications and equipment, a number of WWII Japanese ordnance items were encountered and destroyed. Was deployed with a joint construction project at Udorn and OuBon, Thailand, in which a large rock crushing and quarry operation was conducted to produce rock for airfield construction near the Nam Si-Mekong River near Western Viet Nam. Instructed Thailand military forces in Demolition and Mine Warfare procedures.

Jun. 1960-Dec. 1960 End of Marine Active Duty Service. Was employed by Cole Construction Company of Weirton, West Virginia, on projects of construction, and blasting as well as earth removal along the Ohio River during construction of the Koppers Chemical Rocket fuel Plant, built at Follansbee, West Virginia.

May 1957-Jun. 1960 Co.C 8th Engineer Bn, Camp LeJeune, North Carolina. Was assigned as demolition member during quarry and rock crushing operations at Vieques Island P.R. Cleared large areas of dynamite miss-fires at Blue Beach Quarry Operation, Veiques, PR. C Co. 7th Engineer attached to FMF-Pac, 3rd Marine Div. Okinawa. During this tour of duty I encountered basic demolition operations in the Philippine Islands of old or and damaged bridges, piers and docks on the Islands of Luzon, Mindoro and Corregidor Island.

Feb. 1955-Jun. 1957 My first civilian employment was with Bethany Mining Company, Brooke County, West Virginia. I was employed as a helper to Master Blaster Edward G. Forker in deep pit #2 at Beach Bottom, West Virginia, during operations as a coal miner.



CERTIFICATE OF TRAINING

This Certifies That

JOHN B. GRACE

Satisfactorily Completed the

**OSHA 40- Hour Hazardous Waste Site Worker
and Emergency Response Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(1)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96

A handwritten signature in cursive script, appearing to read "Michael K. ...", is written over a horizontal line. Below the signature, the word "INSTRUCTOR" is printed in a small, sans-serif font.

INSTRUCTOR

U.S. Naval School Explosive Ordnance Disposal



This certifies that

SERGEANT JOHN B. GRACE 1553954/2336 USMC

having successfully completed the prescribed course of study
for Explosive Ordnance Disposal

is awarded this

Certificate

this 25th day of FEBRUARY A.D. 1966

A handwritten signature in cursive script, appearing to read "K. Ploof".

K. PLOOF, CDR, USN

COMMANDING OFFICER



JAMES RATCLIFF
UXO SPECIALIST

Years of Civilian UXO Experience: 9 Month

6/95-2/26/96 UXB international, UXO Specialist, Responsible for Range Clearance at Camp Claiborne, LA. Ordnance encountered: 20 mm, bombs, Rockford, IL Ordnance encountered: mortars, 37mm, Crab orchard, Marion, IL, Ordnance encountered: M1 landmines, Umatilla Army Depot, Umatilla, Or Ordnance encountered: bombs, rockets, projectiles, small arms, grenades landmines.

Years of Military EOD Experience: 4 years 9 months

9/87-4/92 53rd Ord. Det. (EOD) Yakima, WA. EOD specialist, Team member, Team leader. Provided EOD support to local, state, and federal agency in Eastern Washington, Northeast Oregon, Northern Idaho, and Montana. U.S. Secret Service. Support for Umatilla Army Depot and Sierra Army Depot. Range support for Yakima Firing Center. Responded to incidents involving IEDs, bombs, rockets, projectiles, small arms, grenades, GMS, air craft weapons.

8/90-4/91 53rd Ord. Det. (EOD) Operation Desert Shield/Storm. EOD Team member, Team leader. Responded to incidents involving IEDs, bombs, rockets, projectiles, small arms, grenades, GMS, air craft weapons, land mines, dispensed munitions.

MILITARY EOD EDUCATION:

EOD School Phase I	9/87
US Naval EOD school	9/89
EOD School Phase III	10/89
EOD Refresher	11/87, 11/89, 3/92



CERTIFICATE OF TRAINING

This Certifies That

JAMES D. RATCLIFF

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

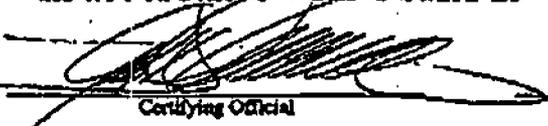
Certificate of Training



this certifies that

James Ratcliff

has completed the requirements for
40 Hour Training
Hazardous Waste Operations
in accordance with OSHA 29 CFR 1910.120 (e) (9)

 6.1.95
Certifying Official Date



Naval School Explosive Ordnance Disposal Certificate of Completion

Presented To

Specialist
James D. Ratcliff, USA

For having successfully completed
the prescribed course of study for

SURFACE BASIC EXPLOSIVE ORDNANCE DISPOSAL
4 APRIL 1989 THRU 21 SEPTEMBER 1989

21 September 1989

Date

M. G. Mathews
M. G. MATHEWS, CDR, USN

Commanding Officer

Merlin D. Clark
UXO SPECIALIST

EOD SCHOOL ATTENDANCE: OCTOBER 1982-DECEMBER 1983
(Including Second Class Diver School)

Jan 84-Nov 87 EOD MOBILE UNIT TWO U.S. NAVY. Leading Petty Officer Boat Shop, Training Office, Two Shipboard Detachments. Temporarily assigned to following EOD GROUP Two Detachments for Demo Operations; Yorktown, VA (3 dets), Charleston, SC, Roosevelt RDS, PR (Vieques Island Impact Area), Mobile Unit Two Det 14, Det 16, Royal Navy Barry Burden Demo Range, Dundee, Scotland. Mine Clearance Ops off of Charleston, SC, Norfolk, VA, Moorehead city, NC, and Cape Canaveral, FL. Senior EOD Tech, Diver, Dive Supervisor, Small Craft Operator.

Jan 88-Jan 92 EG&G Washington Analytical Services Center Contractor to Naval Undersea System Center. Research and Development of Launch Parameters and Ships Certification for Submarine Launched Encapsulated Harpoon and Tomahawk Cruise Missiles. Transport, receipt, diagnostics, troubleshooting, and repair of missile system and MK 48 Exercise Torpedoes, Presetable Launch Vehicles, and Mobile Submarine Simulators. Diving Supervisor/Lead Diver. Responsible for on site management of Scuba/Surface Supplied Operations. Ships Husbandry, Salvage, David Taylor Research Center Ops, and submarine launched weapons recovery.

Jan 92-Mar 93 EOD World Services, Inc., Kuwait. Operated as part of Multi-National effort to clear the country of Kuwait of DUD fired ordnance dropped by coalition forces, Iraqi ammo supply points and mine fields. By the end of EODWSI contract, U.S. EOD (140 techs) had disposed of 13,000 metric tons net explosive weight of stockpiled Iraqi ordnance; 300,000 landmines and 200,000 bombs and bomblets dropped by coalition forces.

Jan 94-Feb 94 CMS, Inc. UXO clearance of twenty six mile corridor across Chocolate Mountain Marine Corp Ariel Gunnery Range utilizing Ground Penetration Radar and Magnetometry for installation of natural gas pipeline for California Gas.

Apr 94-June 94 EOD Technologies. Performed Visual and Magnetic Survey of various former Army/Air Force Chemical Weapon loading and impact sites in Withalocooche National Forest and Brooksville, FL Airport.

Aug 95-Oct 95 Allied Technology Group/CMSI. Performed Surface clearance of five one square kilometer sample grids in Leach Lake Bombing Area, Ft. Irwin, CA. Located, Identified, and disposed of over 10,000 pieces of Ordnance.

Oct 95-Dec 95 GEO-Centers Inc. Performed final underwater clearance of Mirror Lake on Ft. Devens, Mass. Located and removed ordnance items and 55 gallon drums suspected of containing Hazmat or Petroleum products. Cleared all metallic obstacles to swimmers to 30 feet water depth. Locating of anomalies was accomplished by Underwater Magnetometry and Total Area Navigation. BRAC Project.

Jan 96-Approx. Mar 96 CMS Environmental. Eaker AFB, Blytheville, AR. BRAC Project. Sub Surface Clearance (to three feet) of 50 acre Explosive Ordnance Disposal Area. Project in progress.

COMPLETION DATES:

FIRST AID NOV 95

CPR NOV 95

OSHA PHYSICAL NOV 95

OSHA 40 HR MAR 95

OSHA SITE
SUPERVISOR JAN 94



CERTIFICATE OF TRAINING

This Certifies That

MERLIN D. CLARK

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Completion

Presented to

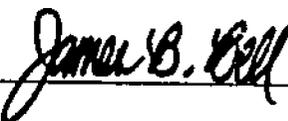
Merlin Clark

for successfully completing the requirements for

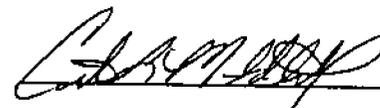
Hazardous Waste Operations and Emergency Response

This 40-hour course satisfies the requirements of O.S.H.A. 29 CFR, Part 1910, Section 120

On the 11th Day of March, 1995



James B. Bell, President



Director of Operations

CAPE CANAVERAL
• Marine Services •
— INC. —

ENVIRONMENTAL TRAINING DIVISION

Certificate: 1864

PHYSICIAN'S STATEMENT

FOR EMPLOYEE OR APPLICANT OF

TYPE OF EXAM: Annual

DATE OF EXAM: Nov. 2, 1995

NAME:

Clark

Merlin

D

Last

First

M.I.

DATE OF BIRTH: 11-16-59

SOCIAL SECURITY NUMBER: 527-41-5409

THE INDIVIDUAL NAMED ABOVE HAS:

1. ~~Undergone~~ a physical examination per OSHA (29 CFR 1910.120) and been found medically:
 - () Qualified for hazardous waste site work
 - () Not qualified for hazardous waste site work*

2. ~~Undergone~~ a physical examination as per OSHA (29 CFR 1910.134 (b) (10)) and been found medically:
 - () Qualified to use a respirator
 - () Not qualified to use a respirator

3. ~~Undergone~~ a physical examination as per OSHA 29 CFR 1910, Subpart T, EM 385-1-1, and U.S. Navy Diving Manual, Volume 1, NAVSEA 0994-LP-001-9010 and been found medically:
 - () Qualified to perform diving operations
 - () Not qualified to perform diving operations

PHYSICIAN'S SIGNATURE

Glenn R. Edgecombe, MD, PC

PRINTED NAME OF PHYSICIAN

7700 OLD BRANCH AVE.

PHYSICIAN'S ADDRESS

SUITE B201

CLINTON, MD 20735

PHYSICIAN'S PHONE

301-868-0150

PHYSICIAN'S STATE LICENSE NUMBER

D23826 MD

NOTE: Copies of the test results are maintained and available at:

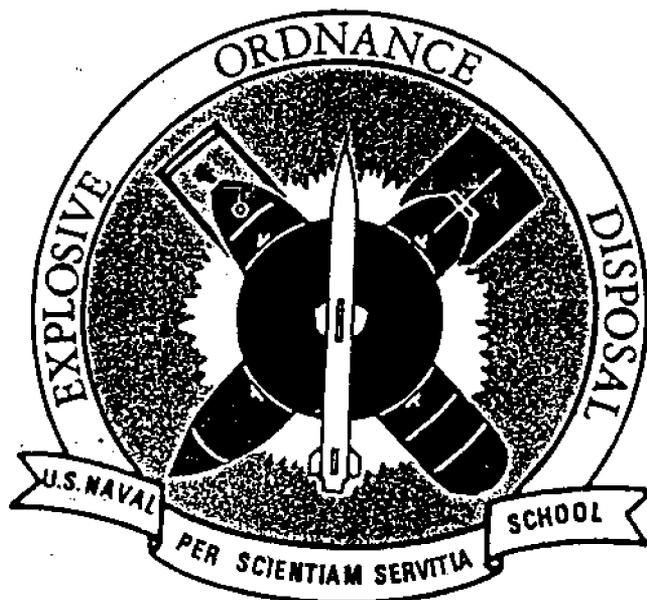
Glenn R. Edgecombe, M.D., P.C.
7700 Old Branch Avenue, Suite B-201
Clinton, MD 20735
(301) 868-0150

OSHA 1910.120(f)(4) states that the physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.

OSHA 1910.134 (b) (10) states that persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).

- If it is the opinion of the examining physician that an examinee is unqualified to perform hazardous waste site work or to wear a respirator, the physician should append a further report to this statement which details reasons for the opinion.

Naval School Explosive Ordnance Disposal



This certifies that

Second Class Sonar Technician (Surface)
Merlin D. Clark, 527-41-5409, USN

having successfully completed
the prescribed course of study for

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

is awarded this
Certificate

this 1st day of December A.B. 1983
J. Sedlak, Jr.
SEDLAK, JR., CDR, USN
COMMANDING OFFICER

DORELL A. POTTS**UXO SPECIALIST**DATE ATTENDED BASIC EOD SCHOOL: November 1973 to April 1974

EOD/UXO ASSIGNMENTS:

Apr 74 - Jun 75 EOD Specialist, 54th Ordnance Det., (EOD), Ft. Monmouth, NJ. Participated in range clearance operations.

Jun 75 - Aug 77 EOD Specialist, 94th Ordnance Detachment (EOD), Ft. Carson, CO. Participated in planning and conducting range clearance operations.

Aug 77 - Apr 81 EOD Sergeant, 45th Ordnance Detachment (EOD), Ft. Polk, LA. Supervised and participated in planning and conducting range clearance operations. Also participated in 2 large range clearance operations at Ft. Hood, TX.

Apr 81 - Aug 84 Instructor at EOD School, EOD Training Detachment #1, Indian Head Naval Ordnance Station, MD. Air and Ground Ordnance Divisions - teaching basic EOD students, refresher courses and foreign students.

Aug 84 - Oct 85 EOD Team Leader SGT, 88th Ordnance Detachment (EOD), Ft. McCoy, WI. Performed EOD missions in planning and conducting range clearance operations, render safe procedures, and destroying of ammunition.

Oct 85 - Dec 85 Graduated Ammunition Inspector Course as Distinguished Graduate, 5th TNG (ST) Co., USAOMMCS, Restone Arsenal, AL.

Jan 86 - Jan 88 Ammunition Inspector, 60th Ordnance Company, Germany, APO. Supervised and conducted periodic receipt, initial receipt inspections of conventional , sotrage monitoring, magazine inspections, safety-oriented supervision of ammunition shipping and receiving operations.

Feb 88 - Jun 89 Ammunition Inspector, 63rd Ordnance Company, Ft. Lewis, WA. Supervised and conducted inspections, including storage and transportation.

Jul 89 - Sep 94 Security Officer, Plant Security Officer, Construction Site Security Officer, Federal government Secure Site Security Officer and received Fire Fighting training. (Currently on EPIC contract).



CERTIFICATE OF TRAINING

This Certifies That

DARRELL A. POTTS

Satisfactorily Completed the

**OSHA 40- Hour Hazardous Waste Site Worker
and Emergency Response Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(1)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Naval School Explosive Ordnance Disposal



This certifies that

SPECIALIST FIFTH CLASS DARRELL A. POTTS, 329-44-7125, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL 431-55D20 - 55D30

is awarded this
Certificate

this 12TH day of APRIL A.D. 1974



D. L. Schaible

D. L. SCHAIBLE, CDR, USN

COMMANDING OFFICER

THOMAS C. KUTSCHER

UXO SPECIALIST

DATE ATTENDED BASIC EOD SCHOOL: 1991

EOD/UXO ASSIGNMENTS:

1986 - 1990

Bridge Crewmember, US Army, Ft. Leonard Wood, MO, and Germany. Assisted in the assembly and disassembly of floating and fixed prefabricated bridges. Operated and maintained light equipment and vehicles up to 5 tons. Trained personnel on assembly and disassembly of bridges and on the maintenance and safety of military vehicles.

1990 - 1990

Railroad Brakeman (Weekend-Duty), US Army Reserve, Middletown, CT. Member of 3 to 5 personnel team.

1991 - 1994

Bomb Disposal Technician. US Army, Ft. Sill, OK. Organized, corrected, and implemented the organizations's Environmental conservation and Protection Program. Instructed personnel on recognition and hazards of explosive ordnance. Managed and maintained the nuclear, biological, chemical and radiation protection sections. Participated in range clearance both on and off Ft. Sill.



CERTIFICATE OF TRAINING

This Certifies That

THOMAS C. KUTSCHER

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

This certifies that

THOMAS C. KUTSCHER

has completed the

HAZARDOUS MATERIALS INCIDENT RESPONSE OPERATIONS (165.5)

*Training Course
2.1 Continuing Education Units
Windsor Locks, Connecticut
January 18-20 & 26-27, 1995*

Presented by

Connecticut Fire Academy

In Cooperation With the

**U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE**

Kenneth Heff

Course Director
Connecticut Fire Academy

CorpCare OCCUPATIONAL HEALTH CENTER

WORK EVALUATION/RECOMMENDATIONS

Name: Thomas Kulscher Date: 4/9/96

Company: 2/2 Job Title/Position _____

I. Type of Examination

- Preplacement Return to Work Fitness for Duty

The above named employee/applicant has been physically examined and pertinent medical history has been reviewed. Based on this health assessment and the job requirements as provided by the employer, the following recommendations are made:

- No work restrictions; individual is fully qualified to perform all necessary job functions safely under the indicated working conditions and environment.
- Work Restrictions/Accommodations: _____
- Placement delayed pending further medical evaluation
- Acknowledgement of physical defect requested for: _____

II. Americans with Disability Compliance, if applicable

- Presence of direct threat
- Substantial risk of harm to safety of individual
- Substantial risk of harm or safety to others in work place
- Emergency evaluation and communication requirements

III. Drug Screening: D.O.T./N.I.D.A. Standard Panel

- Negative for illegal substances
- Confirmed Positive for illegal substances

IV. Physician [Signature] Signature [Signature] Date 4/9/96

V. I have been informed of the findings of this screening evaluation and these recommendations.

Name: [Signature] Signature _____ Date _____

AN AFFILIATE OF MANCHESTER MEMORIAL HOSPITAL
1075 Tolland Turnpike, Manchester, CT 06040 (203)647-4796



**Naval School
Explosive Ordnance Disposal
Certificate of Completion**

Presented To

Specialist
Thomas C. Rutscher, USA

For having successfully completed
the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL PHASE II

12 Sep 1991

Date

JOHN J. WALSH, CDR, USN

Commanding Officer

MARVETTE BATES UXO SPECIALIST

DATE ATTENDED BASIC EOD SCHOOL: November 1983 - April 1984

EOD/UXO ASSIGNMENTS

Apr 84 - Apr 93 46 EMS, Eglin AFB FL. Team Chief, In charge of supply, training and operations. Primary responsibility was clearing Eglin range. Worked extensively with research and development division. Systems tested, RSP'd and destroyed included the BLU-97, BLU-61, BLU-63, BLU-91, BLU-92 and the BLU-106 systems. All Mk series iron bombs. In addition, all WWII vintage munitions.

Apr 93 - Jul 94 HFA, Inc., UXO Specialist, Contract DACA87-92-D-0133, DO #0004, Fort Sill, OK, and DO #0007, Tooele Army Depot, NE. Range clearances.

Oct 94 - Dec 94 UXB International, Inc., UXO Specialist. Morgan Depot, NJ and Tooele Army Depot, UT. Range clearances.



CERTIFICATE OF TRAINING

This Certifies That

MARVETTE GATES

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training



this certifies that
Marvette Bates

has completed the requirements for
40 Hour Training
Hazardous Waste Operations
in accordance with OSHA 29 CFR 1910.120

[Signature]

Training Officer

9/15/97

Date

Naval School Explosive Ordnance Disposal



This certifies that

Staff Sergeant
Harvette Bates, 266-11-2203, USAF

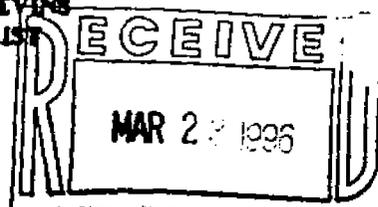
having successfully completed
the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL SPECIALIST - GSABN46430
PDS-CID

is awarded this
Certificate

this 25th day of April A. B. 1984
J. Sedlak Jr.
SEDLAK JR. CDR, USN
COMMANDING OFFICER

**MICHAEL K. BLEVINS
UXO SPECIALIST**



Years of Civilian UXO Experience: 11 months

CIVILIAN UXO EXPERIENCE:

- 06/95-08/95 UXB International, Inc.; UXO Specialist. Provided UXO support for Camp Claiborne, LA. Surface/subsurface clearance to 2' depth 210 acres at the Kisatchi National Forest.
- 08/95-10/95 UXB International, Inc.; UXO specialist. Provided support for surface clearance of 600 acres of former Camp Grant, IL. Member of demolition team.
- 10/95-01/96 UXB International, Inc.; UXO specialist. Provided support for EE/CA at Crab Orchard National Wildlife Refuge, IL. Cleared sample grids to 4' depth and conducted soil samples to identify areas of TNT/RDX contamination.
- 01/96-02-96 UXB International, Inc.; Member of intrusive team, conducting sifting operations of burial sites at Umitilla Army Depot, CR.

Years of Military EOD Experience: 18 years

MILITARY EOD EXPERIENCE:

- 01/77-05/82 410 MMS/EOD CBS, K.I. Sawyer AFB, MI; EOD Specialist. Provided EOD Support for seven Air Force Bases, numerous small Air Force sites, Army, Coast Guard, Secret Service, local law enforcement and several special projects/clearances. Ordnance encountered: Special Weapons, missiles, bombs, dispensed munitions, rockets, projectiles, mortars, mines, grenades, flares, IED's, A/C guns, A/C crashes and fireworks.
- 05/82-05/84 Det 3, 425 MUNSS, CFB Bagotville, Quebec, Canada; MAJCOM Special Activity EOD Specialist. Provided EOD Support to assigned unit, Canadian Forces, and local law enforcement. Involved in operations on aircraft explosive devices, bombs, projectiles and IED's. Exploited foreign munitions items for technical intelligence information. Trained non-EOD personnel to properly handle and utilize high explosives.
- 06/84-11/89 57 EMS/EOD, Nellis AFB, NV; EOD Team Chief and Supervisor. Provided EOD support for assigned unit, numerous U.S. and foreign units using the NW Bomb and Gunnery Ranges, Secret Service and local law enforcement. Coordinated and supervised dozens of range clearances. Responsible for all personnel (5-35), vehicles, equipment and explosives required to complete these operations. Ordnance encountered during clearances and responses: IEDs, U.S. missiles, bombs, rockets, dispensed munitions, projectiles, mortars, mines, grenades, aircraft explosive devices, chaff/flares, fireworks, Foreign bombs, rockets, projectiles, and grenades.
- 11/89-11/92 20 EOD Flight, RAF Bicester, UK; EOD Team Chief and Supervisor, Deployed EOD Branch chief. Provided EOD support for assigned unit, several support bases, 4 TFW (P) Saudi Arabia. Ordnance encountered: U.S. missiles, bombs, dispensed munitions, rockets, projectiles, grenades, chaff/flares, A/C explosive devices, foreign missiles, bombs, dispensed munitions, rockets, projectiles, mortars, mines, grenades, and boobytraps.
- 11/92-06/94 438 CES/EOD McGuire AFB, NJ; NCIOC EOD, Deployed EOD Branch Chief. Provided EOD support to assigned unit, support, support bases, Secret Service, local law enforcement, and U.N. Forces in Somalia. Ordnance encountered: U.S. missiles, bombs, rockets, projectiles, mortars, grenades, mines, foreign missiles, projectiles, mortars, rockets, mines, and grenades.

MILITARY EOD EDUCATION

- US Naval EOD School 01/77
EOD Refresher 09/80,10/87
Nuclear Weapon EOD Refresher 11/78,09/79,02/87,05/89



CERTIFICATE OF TRAINING

This Certifies That

MICHAEL K. BLEVINS

Satisfactorily Completed the

**OSHA 08 - Hour Hazardous Waste Site Worker
Supervisor/Refresher Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(4) & (8)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR

Certificate of Training



this certifies that

Michael K. Blevins

has completed the requirements for
40 Hour Training
Hazardous Waste Operations
in accordance with OSHA 29 CFR 1910.120 (e) (9)



Certifying Official

3-31-95

Date

301 705 7501 ATTN: MR FROSEN

Physician Written Opinion - Hazardous Materials

The purpose of this form is to inform the employee of the physician's written opinion relating to this examination.

NAME Bleuns Michael K BADGE _____ DIV/SEC/SHIFT _____ AGE 38
SS# 382 68 2768 JOB CODE _____

A) EMPLOYEE (HAS) (HAS NOT) ANY DETECTED MEDICAL CONDITIONS THAT WOULD PLACE THE EMPLOYEE AT AN INCREASED RISK FOR HEALTH IMPAIRMENT FROM ASSOCIATION WITH HAZARDOUS MATERIALS SMOKING (Circle) YES NO

B) (LIMITATIONS) (NO LIMITATIONS) ON THE USE OF PERSONAL PROTECTIVE EQUIPMENT OR ASSIGNED WORK

C) * THE EMPLOYEE (HAS) (HAS NOT) BEEN INFORMED OF THE RESULTS OF THE MEDICAL EXAMINATION AND OF ANY MEDICAL CONDITIONS WHICH REQUIRE FURTHER EXAMINATION OR TREATMENT.

D) OTHER None: See attached letter dated 3/18/96.

[Signature]
Physician's Signature
3/18/96
Date

Naval School Explosive Ordnance Disposal



This certifies that

AIRMAN FIRST CLASS MICHAEL K. BLEVINS, 382-68-2768, USAF

having successfully completed
the prescribed course of study for

MUNITIONS DISPOSAL SPECIALIST - 5ABN46430 - PDS: CID 19wk/3da

is awarded this
Certificate

this 21ST day of JANUARY A.D. 1977


D. L. SCHATBLE, CDR, USN

COMMANDING OFFICER

520-652-1233

JOHN M. (MIKE) HAYES - UXO SPECIALIST

Years of Civilian UXO Experience: Five.

CIVILIAN UXO EXPERIENCE:

From	To	
6/74	1/75	TERA, Socorro, N.M. EOD Technician. Set up test shots of various types of munitions for U.S. and foreign governments. Destroyed old and damaged UXO. Conducted tests of prototype ammunition, including operation of boresighting devices and collection of test data upon completion of each project.
2/75	1/77	EOD Facility, IHM, Ordnance Technician. Tested various EOD tools for possible use by Army EOD units. Tests took place at the facility and at Redstone Arsenal.
6/92	11/92	OHM Corp. Team Leader and QA Technician. Supervised 5 to 15 sweep personnel during sweeps of former ranges at Ft Meade. Encountered various types of anti-tank and artillery ordnance. Participated in layout of sweep lanes through use of land survey instruments. Conducted checks of previously swept areas.

Years of Military EOD Experience: 10 years, 9 months

MILITARY EOD EXPERIENCE:

6/63	11/64	77th Ord Det - EOD Specialist Performed EOD functions, including frequent informal range sweeps of the tank gunnery range at Ft. Irwin, Ca.
12/64	12/67	97th Ord Det - EOD Specialist and Ass't Supv. Destroyed large amounts of unserviceable ordnance by detonation, burning and sea dump. Performed rendering safe procedures on a number of GP Bombs found on property near Tokyo.
1/68	3/71	EOD Testing and Training Division, Redstone Arsenal. As Chief Training NCO, scheduled and conducted classes in areas of EOD interest to units undergoing their two-week annual training period. As NCOIC of an evaluation team, developed and presented individual EOD exercises to EOD units undergoing the testing phase. Upon completion of the week long series of problems, supervised collation of the Evaluators' observations.
3/71	3/72	Attended 13-week Vietnamese Language course. Subsequently assigned to the 42d, 59th and 533d EOD detachments in RVN as an EOD Supervisor. Supervised ordnance destruction shots during stand-down of those units. Involved in frequent field trips to destroy ordnance encountered by combat units.
4/72	1/73	Demolition team, Yuma Proving Grounds, Az. Ass't Supv. Supervised and participated in daily range clearing operations involving disposal of various sized rockets, artillery and new/prototype munitions.
1/73	3/74	58th Ord Det - EOD Supv. Supervised EOD teams assigned to assist VIP escorts. Responded to incidents involving military ordnance and IED.

MILITARY EOD EDUCATION:

EOD Basic School	20 weeks	Jun 63, Jan 64
EOD Refresher Ing.	6 weeks	Jun 68, Jun 72



CERTIFICATE OF TRAINING

This Certifies That

JOHN M. HAVES

Satisfactorily Completed the

**OSHA 40- Hour Hazardous Waste Site Worker
and Emergency Response Course**

**Hazardous Waste Operations
29 CFR 1910.120(e)(1)**

PRESENTED BY HUMAN FACTORS APPLICATIONS, INC.

Dated this 10th Day of May 19 96


INSTRUCTOR



**Naval School
Explosive Ordnance Disposal
Certificate of Completion**

Presented To

SGT JOHN M. HAYES, USA

*For having successfully completed
the prescribed course of study for
EXPLOSIVE ORDNANCE DISPOSAL
PHASE I AND II - SURFACE*

18 OCT 1963

Date

J. R. LAKE, CDR USN

Commanding Officer

APPENDIX I

**ACCIDENT REPORT
FORM 3394**

(For Safety Staff only)	REPORT NO	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT <small>(For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)</small>			REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)	
1 ACCIDENT CLASSIFICATION							
PERSONNEL CLASSIFICATION		INJURY/ILLNESS/FATAL		PROPERTY DAMAGE		MOTOR VEHICLE INVOLVED	
GOVERNMENT <input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY		<input type="checkbox"/>		<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER		<input type="checkbox"/>	
<input type="checkbox"/> CONTRACTOR		<input type="checkbox"/>		<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER		<input type="checkbox"/>	
<input type="checkbox"/> PUBLIC		<input type="checkbox"/> FATAL <input type="checkbox"/> OTHER		PROPERTY DAMAGE		MOTOR VEHICLE INVOLVED	
2 PERSONAL DATA							
a. NAME (Last, First, MI)		b. AGE	c. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		d. SOCIAL SECURITY NUMBER		
e. GRADE		f. JOB SERIES/TITLE		g. DUTY STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ON DUTY <input type="checkbox"/> TDY <input type="checkbox"/> OFF DUTY			
h. EMPLOYMENT STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ARMY ACTIVE <input type="checkbox"/> ARMY RESERVE <input type="checkbox"/> VOLUNTEER <input type="checkbox"/> PERMANENT <input type="checkbox"/> FOREIGN NATIONAL <input type="checkbox"/> SEASONAL <input type="checkbox"/> TEMPORARY <input type="checkbox"/> STUDENT <input type="checkbox"/> OTHER (Specify)							
3 GENERAL INFORMATION							
a. DATE OF ACCIDENT (month/day/year)		b. TIME OF ACCIDENT (Military time)		c. EXACT LOCATION OF ACCIDENT		d. CONTRACTOR'S NAME	
e. CONTRACT NUMBER <input type="checkbox"/> CIVIL WORKS <input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER (Specify)		f. TYPE OF CONTRACT <input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> SERVICE <input type="checkbox"/> A/E <input type="checkbox"/> DREDGE <input type="checkbox"/> OTHER (Specify)		g. HAZARDOUS/TOXIC WASTE ACTIVITY <input type="checkbox"/> SUPERFUND <input type="checkbox"/> DERP <input type="checkbox"/> IRP <input type="checkbox"/> OTHER (Specify)		d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR:	
4 CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see instructions)							
a. CONSTRUCTION ACTIVITY (CODE)				b. TYPE OF CONSTRUCTION EQUIPMENT (CODE)			
5 INJURY / ILLNESS INFORMATION (Include name on line and corresponding code number in box for items e, f & g - see instructions)							
a. SEVERITY OF ILLNESS / INJURY (CODE)				b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY	
e. BODY PART AFFECTED (CODE) PRIMARY _____ (CODE) SECONDARY _____ (CODE)				f. TYPE AND SOURCE OF INJURY/ILLNESS TYPE _____ (CODE) SOURCE _____ (CODE)			
g. NATURE OF ILLNESS / INJURY (CODE)							
6 PUBLIC FATALITY (Fill in line and corresponding code number in box - see instructions)							
a. ACTIVITY AT TIME OF ACCIDENT (CODE)				b. PERSONAL FLOATATION DEVICE USED? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A			
7 MOTOR VEHICLE ACCIDENT							
a. TYPE OF VEHICLE <input type="checkbox"/> PICKUP/VAN <input type="checkbox"/> AUTOMOBILE <input type="checkbox"/> TRUCK <input type="checkbox"/> OTHER (Specify)		b. TYPE OF COLLISION <input type="checkbox"/> SIDE SWIPE <input type="checkbox"/> HEAD ON <input type="checkbox"/> REAR END <input type="checkbox"/> BROADSIDE <input type="checkbox"/> ROLL OVER <input type="checkbox"/> BACKING <input type="checkbox"/> OTHER (Specify)			c. SEAT BELTS (1) FRONT SEAT (2) REAR SEAT		USED NOT USED NOT AVAILABLE
8 PROPERTY/MATERIAL INVOLVED							
a. NAME OF ITEM			b. OWNERSHIP		c. \$ AMOUNT OF DAMAGE		
(1)							
(2)							
(3)							
9 VESSEL / FLOATING PLANT ACCIDENT (Fill in line and corresponding code number in box from list - see instructions)							
a. TYPE OF VESSEL/FLOATING PLANT (CODE)				b. TYPE OF COLLISION/MISHAP (CODE)			
ACCIDENT DESCRIPTION (Use additional paper, if necessary)							

CAUSAL FACTOR(S) (Read Instruction Before Completing)

a. (Explain YES answers in item 13)

	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	<input type="checkbox"/>	<input type="checkbox"/>
SECTION MAINTENANCE: Were inspection & maintenance procedures a factor?	<input type="checkbox"/>	<input type="checkbox"/>
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	<input type="checkbox"/>	<input type="checkbox"/>
OPERATING PROCEDURES: Were operating procedures a factor?	<input type="checkbox"/>	<input type="checkbox"/>
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	<input type="checkbox"/>	<input type="checkbox"/>
HUMAN FACTORS: Did any human factors such as size or strength of person, etc., contribute to accident?	<input type="checkbox"/>	<input type="checkbox"/>
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>

a. (CONTINUED)

	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as noise, radiation, etc., contribute to accident?	<input type="checkbox"/>	<input type="checkbox"/>
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident?	<input type="checkbox"/>	<input type="checkbox"/>

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

YES (If yes, attach a copy.) NO

12 TRAINING

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? <input type="checkbox"/> YES <input type="checkbox"/> NO	b. TYPE OF TRAINING. <input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB	c. DATE OF MOST RECENT FORMAL TRAINING. ____/____/____ (Month) (Day) (Year)
--	---	--

13 FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)

a. DIRECT CAUSE

b. INDIRECT CAUSE(S)

14 ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).

DESCRIBE FULLY:

DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

a. BEGINNING (Month/Day/Year) ____/____/____	b. ANTICIPATED COMPLETION (Month/Day/Year) ____/____/____
---	--

c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE (Mo/Da/Yr) ____/____/____	e. ORGANIZATION IDENTIFIER (Div. Br. Sect) _____	f. OFFICE SYMBOL _____
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16 MANAGEMENT REVIEW (1st)

a. CONCUR b. NON CONCUR c. COMMENTS

SIGNATURE _____	TITLE _____	DATE _____
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17 MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)

a. CONCUR b. NON CONCUR c. COMMENTS

SIGNATURE _____	TITLE _____	DATE _____
-----------------	-------------	------------

18 SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. CONCUR b. NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS.

SIGNATURE _____	TITLE _____	DATE _____
-----------------	-------------	------------

19 COMMAND APPROVAL

COMMENTS _____

MANDER SIGNATURE _____	DATE _____
------------------------	------------

GENERAL. Complete a separate report for each person who was injured, caused, or contributed to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16 and 17.

INSTRUCTIONS FOR SECTION 1 - ACCIDENT CLASSIFICATION. (Mark All Boxes That Are Applicable.)

- a. **GOVERNMENT.** Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.
 - (1) **INJURY/ILLNESS/FATALITY** - Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.
 - (2) **PROPERTY DAMAGE** - Mark the appropriate box if accident resulted in any damage of \$1000 or more to government property (including motor vehicles).
 - (3) **VEHICLE INVOLVED** - Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) **DIVING ACTIVITY** - Mark if the accident involved an in-house USACE diving activity.
- b. **CONTRACTOR.**
 - (1) **INJURY/ILLNESS/FATALITY** - Mark if accident resulted in any contractor lost-time injury/illness or fatality.
 - (2) **PROPERTY DAMAGE** - Mark the appropriate box if accident resulted in any damage of \$1000 or more to contractor property (including motor vehicles).
 - (3) **VEHICLE INVOLVED** - Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) **DIVING ACTIVITY** - Mark if the accident involved a USACE Contractor diving activity.
- c. **PUBLIC.**
 - (1) **INJURY/ILLNESS/FATALITY** - Mark if accident resulted in public fatality or permanent total disability. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).
 - (2) **VOID SPACE** - Make no entry.
 - (3) **VEHICLE INVOLVED** - Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" is marked.
 - (4) **VOID SPACE** - Make no entry.

INSTRUCTIONS FOR SECTION 2 - PERSONAL DATA

- a. **NAME** - (MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.
- b. **AGE** - Enter age.
- c. **SEX** - Mark appropriate box.
- d. **SOCIAL SECURITY NUMBER** - (FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).
- e. **GRADE** - (FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: O-6; E-7; WG-8; WS-12; GS-11; etc.

- f. **JOB SERIES/TITLE** - For government civilian employees enter the pay plan, full series number, and job title, e.g. GS-0810/Civil Engineer. For military personnel enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11G50. For contractor employees enter the job title assigned to the injured person, e.g. carpenter, laborer, surveyor, etc..
- g. **DUTY STATUS** - Mark the appropriate box.
 - (1) **ON DUTY** - Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.
 - (2) **TBY** - Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.
 - (3) **OFF DUTY** - Person was not on official business at time of accident.
- h. **EMPLOYMENT STATUS** - (FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTION FOR SECTION 3 - GENERAL INFORMATION

- a. **DATE OF ACCIDENT** - Enter the month, day, and year of accident.
- b. **TIME OF ACCIDENT** - Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).
- c. **EXACT LOCATION OF ACCIDENT** - Enter facts needed to locate the accident scene. (installation/project name, building number, street, direction and distance from closest landmark, etc..).
- d. **CONTRACTOR NAME**
 - (1) **PRIME** - Enter the exact name (title of firm) of the prime contractor.
 - (2) **SUBCONTRACTOR** - Enter the name of any subcontractor involved in the accident.
- e. **CONTRACT NUMBER** - Mark the appropriate box to identify if contract is civil works, military, or other; if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.
- f. **TYPE OF CONTRACT** - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
- g. **HAZARDOUS/TOXIC WASTE ACTIVITY (HTW)** - Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUOS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 - CONSTRUCTION ACTIVITIES

- a. **CONSTRUCTION ACTIVITY** - Select the most appropriate construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

- | | |
|-------------------------|----------------------------|
| 1. MOBILIZATION | 14. ELECTRICAL |
| 2. SITE PREPARATION | 15. SCAFFOLDING/ACCESS |
| 3. EXCAVATION/TRENCHING | 16. MECHANICAL |
| 4. GRADING (EARTHWORK) | 17. PAINTING |
| 5. PIPING/UTILITIES | 18. EQUIPMENT/MAINTENANCE |
| 6. FOUNDATION | 19. TUNNELING |
| 7. FORMING | 20. WAREHOUSING/STORAGE |
| 8. CONCRETE PLACEMENT | 21. PAVING |
| 9. STEEL ERECTION | 22. FENCING |
| 10. ROOFING | 23. SIGNING |
| 11. FRAMING | 24. LANDSCAPING/IRRIGATION |
| 12. MASONRY | 25. INSULATION |
| 13. CARPENTRY | 26. DEMOLITION |

b. TYPE OF CONSTRUCTION EQUIPMENT - Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER", and write in specific type of equipment.

CONSTRUCTION EQUIPMENT

- | | |
|------------------------------------|--------------------------------|
| 1. GRADER | 13. DUMP TRUCK (OFF HIGHWAY) |
| 2. DRAGLINE | 14. TRUCK (OTHER) |
| 3. CRANE (ON VESSEL/BARGE) | 15. FORKLIFT |
| 4. CRANE (TRACKED) | 16. BACKHOE |
| 5. CRANE (RUBBER TIRE) | 17. FRONT-END LOADER |
| 6. CRANE (VEHICLE MOUNTED) | 18. PILE DRIVER |
| 7. CRANE (TOWER) | 19. TRACTOR (UTILITY) |
| 8. SHOVEL | 20. MANLIFT |
| 9. SCRAPER | 21. DOZER |
| 10. PUMP TRUCK (CONCRETE) | 22. DRILL RIG |
| 11. TRUCK (CONCRETE/TRANSIT MIXER) | 23. COMPACTOR/VIBRATORY ROLLER |
| 12. DUMP TRUCK (HIGHWAY) | 24. OTHER |

INSTRUCTIONS FOR SECTION 5 - INJURY/ILLNESS INFORMATION

a. SEVERITY OF INJURY / ILLNESS - Reference para 2-10 of USACE Suppl 1 to AR 385-40 and enter code and description from list below.

- | | |
|-----|---|
| NOI | NO INJURY |
| FAT | FATALITY |
| PTL | PERMANENT TOTAL DISABILITY |
| PPR | PERMANENT PARTIAL DISABILITY |
| LWD | LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK |
| NLW | RECORDABLE CASE WITHOUT LOST WORKDAYS |
| RFA | RECORDABLE FIRST AID CASE |
| NRI | NON-RECORDABLE INJURY |

b. ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work.

c. ESTIMATED DAYS HOSPITALIZED - Enter the estimated number of workdays the person will be hospitalized.

d. ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.

e. BODY PART AFFECTED - Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	C8	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW
	CL	THROAT, LARYNX
	CM	MOUTH

ELBOW	EB	BOTH ELBOWS
	ES	SINGLE ELBOW
FINGER	F1	FIRST FINGER
	F2	BOTH FIRST FINGERS
	F3	SECOND FINGER
	F4	BOTH SECOND FINGERS
	F5	THIRD FINGER
	F6	BOTH THIRD FINGERS
	F7	FOURTH FINGER
	F8	BOTH FOURTH FINGERS
TOE	G1	GREAT TOE
	G2	BOTH GREAT TOES
	G3	TOE OTHER
	G4	TOES OTHER
HEAD, EXTERNAL	H1	EYE EXTERNAL
	H2	BOTH EYES EXTERNAL
	H3	EAR EXTERNAL
	H4	BOTH EARS EXTERNAL
	HC	CHIN
	HF	FACE
	HK	NECK/THROAT
	HM	MOUTH/LIPS
	HN	NOSE
	HS	SCALP
KNEE	KB	BOTH KNEES
	KS	KNEE
LEG, HIP, ANKLE, BUTTOCK	LB	BOTH LEGS/HIPS/ANKLES/BUTTOCKS
	LS	SINGLE LEG/HIP/ANKLE/BUTTOCK
HAND	MB	BOTH HANDS
	MS	SINGLE HAND
FOOT	PB	BOTH FEET
	PS	SINGLE FOOT
TRUNK, BONES	R1	SINGLE COLLAR BONE
	R2	BOTH COLLAR BONES
	R3	SHOULDER BLADE
	R4	BOTH SHOULDER BLADES
	RB	RIB
	RS	STERNUM (BREAST BONE)
	RV	VERTEBRAE (SPINE; DISC)
	RZ	TRUNK BONES OTHER
SHOULDER	SB	BOTH SHOULDERS
	SS	SINGLE SHOULDER
THUMB	TB	BOTH THUMBS
	TS	SINGLE THUMB
TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	V2	LUNGS, BOTH
	V3	KIDNEY, SINGLE
	V4	KIDNEYS, BOTH
	VH	HEART
	VL	LIVER
	VR	REPRODUCTIVE ORGANS
	VS	STOMACH
	VV	INTESTINES
	VZ	TRUNK, INTERNAL; OTHER

l. NATURE OF INJURY/ILLNESS - Select the most appropriate nature of injury / illness from the list below. This nature of injury / illness shall correspond to the primary body part selected in 5e, above. Enter the nature of injury / illness name on the line and place the corresponding CODE letters in the box provided.

CODE	SOURCE OF INJURY NAME
0200	ENVIRONMENTAL CONDITION
0210	TEMPERATURE EXTREME (INDOOR)
0220	WEATHER (ICE, RAIN, HEAT, ETC.)
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)
0240	NOISE
0250	RADIATION
0260	LIGHT
0270	VENTILATION
0271	TOBACCO SMOKE
0280	STRESS (EMOTIONAL)
0290	CONFINED SPACE
0300	MACHINE OR TOOL
0310	HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320	HAND TOOL (NONPOWERED)
0330	MECHANICAL POWER TRANSMISSION APPARATUS
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350	VIDEO DISPLAY TERMINAL
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370	HEATING EQUIPMENT
0380	WELDING EQUIPMENT
0400	VEHICLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421	DRIVER OF GOVERNMENT VEHICLE
0422	PASSENGER OF GOVERNMENT VEHICLE
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)
0440	AIRCRAFT (NOT COMMERCIAL)
0450	BOAT, SHIP, BARGE
0500	MATERIAL HANDLING EQUIPMENT
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540	HOIST, SLING CHAIN, JACK
0550	CRANE
0551	FORKLIFT
0560	HANDTRUCK, DOLLY
0600	DUST, VAPOR, ETC.
0610	DUST (SILICA, COAL, ETC.)
0620	FIBERS
0621	ASBESTOS
0630	GASES
0631	CARBON MONOXIDE
0640	MIST, STEAM, VAPOR, FUME
0641	WELDING FUMES
0650	PARTICLES (UNIDENTIFIED)
0700	CHEMICAL, PLASTIC, ETC.
0711	DRY CHEMICAL—CORROSIVE
0712	DRY CHEMICAL—TOXIC
0713	DRY CHEMICAL—EXPLOSIVE
0714	DRY CHEMICAL—FLAMMABLE
0721	LIQUID CHEMICAL—CORROSIVE
0722	LIQUID CHEMICAL—TOXIC
0723	LIQUID CHEMICAL—EXPLOSIVE
0724	LIQUID CHEMICAL—FLAMMABLE
0730	PLASTIC
0740	WATER
0750	MEDICINE
0800	INANIMATE OBJECT
0810	BOX, BARREL, ETC.
0820	PAPER
0830	METAL ITEM, MINERAL
0831	NEEDLE
0840	GLASS
0850	SCRAP, TRASH
0860	WOOD
0870	FOOD
0880	CLOTHING, APPAREL, SHOES
0900	ANIMATE OBJECT
0911	DOG
0912	OTHER ANIMAL
0920	PLANT
0930	INSECT
0940	HUMAN (VIOLENCE)
0950	HUMAN (COMMUNICABLE DISEASE)
0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE	SOURCE OF INJURY NAME
1000	PERSONAL PROTECTIVE EQUIPMENT
1010	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020	RESPIRATOR, MASK
1021	DIVING EQUIPMENT
1030	SAFETY BELT, HARNESS
1040	PARACHUTE

INSTRUCTIONS FOR SECTION 6 — PUBLIC FATALITY

- a. **ACTIVITY AT TIME OF ACCIDENT**—Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the most appropriate primary activity area (water-related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

- | | |
|-----------------------------------|--|
| 1. Sailing | 9. Swimming/designated area |
| 2. Boating—powered | 10. Swimming/other area |
| 3. Boating—unpowered | 11. Underwater activities (skin diving, scuba, etc.) |
| 4. Water skiing | 12. Wading |
| 5. Fishing from boat | 13. Attempted rescue |
| 6. Fishing from bank dock or pier | 14. Hunting from boat |
| 7. Fishing while wading | 15. Other |
| 8. Swimming/supervised area | |

NON-WATER RELATED RECREATION

- | | |
|--|---|
| 16. Hiking and walking | 23. Sports/summer (baseball, football, etc.) |
| 17. Climbing (general) | 24. Sports/winter (skiing, sledding, snowmobiling etc.) |
| 18. Camping/picnicking authorized area | 25. Cycling (bicycle, motorcycle, scooter) |
| 19. Camping/picnicking unauthorized area | 26. Gliding |
| 20. Guided tours | 27. Parachuting |
| 21. Hunting | 28. Other non-water related |
| 22. Playground equipment | |

OTHER ACTIVITIES

- | | |
|--|----------------------------------|
| 29. Unlawful acts (fights, riots, vandalism, etc.) | 33. Sleeping |
| 30. Food preparation/serving | 34. Pedestrian struck by vehicle |
| 31. Food consumption | 35. Pedestrian other acts |
| 32. Housekeeping | 36. Suicide |
| | 37. "Other" activities |

- b. **PERSONAL FLOTATION DEVICE USED**—If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7—MOTOR VEHICLE ACCIDENT

- a. **TYPE OF VEHICLE**—Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.

- b. **TYPE OF COLLISION**—Mark appropriate box.

- c. **SEAT BELT**—Mark appropriate box.

INSTRUCTIONS FOR SECTION 8—PROPERTY/ MATERIAL INVOLVED

- a. **NAME OF ITEM**—Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.
- b. **OWNERSHIP**—Enter ownership for each item listed. (Enter one of the following: USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE)
- c. **\$ AMOUNT OF DAMAGE**—Enter the total estimated dollar amount of damage (parts and labor), if any.

INSTRUCTIONS FOR SECTION 9 — VESSEL/ FLOATING PLANT ACCIDENT

- a. **TYPE OF VESSEL/FLOATING PLANT**—Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/floating plant.

VESSEL/FLOATING PLANTS

- | | |
|------------------------|----------------------------|
| 1. ROW BOAT | 7. DREDGE/DIPPER |
| 2. SAIL BOAT | 8. DREDGE/CLAMSHELL BUCKET |
| 3. MOTOR BOAT | 9. DREDGE/PIPE LINE |
| 4. BARGE | 10. DREDGE/DUST PAN |
| 5. DREDGE/HOPPER | 11. TUG BOAT |
| 6. DREDGE/SIDE CASTING | 12. OTHER |
- b. **COLLISION/MISHAP**—Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

- | | |
|-----------------------------|-----------------------|
| 1. COLLISION W/OTHER VESSEL | 7. HAULAGE UNIT |
| 2. UPPER GUIDE WALL | 8. BREAKING TOW |
| 3. UPPER LOCK GATES | 9. TOW BREAKING UP |
| 4. LOCK WALL | 10. SWEEP DOWN ON DAM |
| 5. LOWER LOCK GATES | 11. BUOY/DOLPHINCELL |
| 6. LOWER GUIDE WALL | 12. WHARF OR DOCK |
| | 13. OTHER |

INSTRUCTIONS FOR SECTION 10 — ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT—Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

INSTRUCTIONS FOR SECTION 11 — CAUSAL FACTORS

- a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:

- (1) **DESIGN**—Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) **INSPECTION/MAINTENANCE**—Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) **PERSON'S PHYSICAL CONDITION**—Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?
- (4) **OPERATING PROCEDURES**—Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) **JOB PRACTICES**—Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

- (6) **HUMAN FACTORS**—Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
- (7) **ENVIRONMENTAL FACTORS**—Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc., play a part in the accident?
- (8) **CHEMICAL AND PHYSICAL AGENT FACTORS**—Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?
- (9) **OFFICE FACTORS**—Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
- (10) **SUPPORT FACTORS**—Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc.?
- (11) **PERSONAL PROTECTIVE EQUIPMENT**—Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?
- (12) **DRUGS/ALCOHOL**—Is there any reason to believe the person's mental or physical capabilities, judgement, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

- b. **WRITTEN JOB/ACTIVITY HAZARD ANALYSIS**—Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. If one was performed, attach a copy of the analysis to the report.

INSTRUCTIONS FOR SECTION 12 — TRAINING

- a. **WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?**—For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.
- b. **TYPE OF TRAINING**—Mark the appropriate box that best indicates the type of training; (classroom or on-the-job) that the injured person received before the accident happened.
- c. **DATE OF MOST RECENT TRAINING**—Enter the month, day, and year of the last formal training completed that covered the activity-task being performed at the time of the accident.

*The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
*TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION
	TB	BACK STRAIN.
	TC	CONTUSION; BRUISE; ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
	TQ	TRAUMATIC FOOD POISONING
	TW	TRAUMATIC TUBERCULOSIS
	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC DISEASE
	T1	TRAUMATIC CEREBRAL VASCULAR CONDITION/STROKE
	T2	TRAUMATIC HEARING LOSS
T3	TRAUMATIC HEART CONDITION	
T4	TRAUMATIC MENTAL DISORDER; STRESS; NERVOUS CONDITION	
T8	TRAUMATIC INJURY - OTHER (EXCEPT DISEASE, ILLNESS)	

**A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which does not meet the definition of traumatic injury or disability as described above.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
**NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY		
RESPIRATORY DISEASE	RA	ASBESTOSIS
	RB	BRONCHITIS
	RE	EMPHYSEMA
	RP	PNEUMOCOONIOSIS
	RS	SILICOSIS
	RS	RESPIRATORY DISEASE, OTHER
VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
	VC	COCCIDIOMYCOSIS
	VF	FOOD POISONING
	YH	HEPATITIS
	YM	MALARIA
	VS	STAPHYLOCOCCUS
	VT	TUBERCULOSIS
	V8	VIROLOGICAL/INFECTIVE/ PARASITIC-OTHER
DISABILITY, OCCUPATIONAL	DA	ARTHRITIS, BURSITIS
	DB	BACK STRAIN, BACK SPRAIN
	DC	CEREBRAL VASCULAR CONDITION; STROKE
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES RAS)
	DE	EFFECT OF ENVIRONMENTAL CONDITION
	DH	HEARING LOSS
	DK	HEART CONDITION
	DM	MENTAL DISORDER, EMOTIONAL STRESS NERVOUS CONDITION
	DR	RADIATION
	DS	STRAIN, MULTIPLE
	DU	ULCER
	DV	OTHER VASCULAR CONDITIONS
	D8	DISABILITY, OTHER

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
SKIN DISEASE OR CONDITION	58	BIOLOGICAL
	5C	CHEMICAL
	59	DERMATITIS, UNCLASSIFIED

9. TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and Source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples:

(1) An employee tripped on carpet and struck his head on a desk.
TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/oak.
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliver while grinding a turbine blade.
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.
TYPE: 800 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 800, "Traveling in" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT BY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0800	TRAVELING IN
CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOILER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

INSTRUCTIONS FOR SECTION 13 — CAUSES

- a. **DIRECT CAUSES**—The direct cause is that single factor which most directly lead to the accident. See examples below.
- b. **INDIRECT CAUSES**—Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

- a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: failure to provide fall protection at elevation.
Indirect causes: failure to enforce USACE safety requirements; improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.
- b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (note USACE vehicle was in proper/safe working condition).
Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.
Indirect cause: Failure of employee to pay attention to driving (defensive driving).

INSTRUCTIONS FOR SECTION 14 — ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION—Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15 — DATES FOR ACTION

- a. **BEGIN DATE**—Enter the date when the corrective action(s) identified in Section 14 will begin.
- b. **COMPLETE DATE**—Enter the date when the corrective action(s) identified in Section 14 will be completed.
- c. **TITLE AND SIGNATURE**—Enter the title and signature of supervisor completing the accident report. For a **GOVERNMENT** employee accident/illness the immediate supervisor will complete and sign the report. For **PUBLIC** accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For **CONTRACTOR** accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE Supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.
- d. **DATE SIGNED**—Enter the month, day, and year that the report was signed by the responsible supervisor.
- e. **ORGANIZATION NAME**—For **GOVERNMENT** employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For **PUBLIC** accidents enter the USACE organization name for the person identified in block 15.c. For **CONTRACTOR** accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

- f. **OFFICE SYMBOL**—Enter the latest complete USACE Office Symbol for the USACE organization identified in block 15.e.

INSTRUCTIONS FOR SECTION 16 — MANAGEMENT REVIEW (1st)

1ST REVIEW—Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

INSTRUCTIONS FOR SECTION 17 — MANAGEMENT REVIEW (2nd)

2ND REVIEW—The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18 — SAFETY AND OCCUPATIONAL HEALTH REVIEW

3RD REVIEW—The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

INSTRUCTION FOR SECTION 19 — COMMAND APPROVAL

4TH REVIEW—The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.

APPENDIX J

REMEDIAL ACTION
SAFETY PLAN

SITE SPECIFIC

REMEDIAL ACTION SAFETY PLAN

FOR

FORMER CAMP CROFT

SPARTANBURG, SOUTH CAROLINA

FORMER CAMP CROFT REMEDIAL ACTION SAFETY PLAN

1.1 Site Location and Description

1.1.1 The former Camp Croft Training Facility is approximately 19,044.46 acres in area and is approximately 5 miles southeast of Spartanburg, South Carolina. Current land usage is approximately 7,088.08 acres for Camp Croft State Park, 4,936.24 acres for farming, 256 acres for private industry, and 6,764.14 acres of residential used to include a public golf course. This work plan pertains to Ordnance Operable Units (OOU) 1B, 7, 2, and 3 as identified by the Engineering Evaluation/Cost Analysis (EE/CA), Former Camp Croft, January 1996, and Area A39 as identified by the Supplemental Archives Report.

1.1.2 Each site is described in the following paragraphs. The width of the horse trails varies from a narrow path to the width of an abandoned road bed.

- **Ordnance Operable Unit-1B.** OOU-1B is approximately 65 acres located in the center of the park and used for surface recreation. During the EE/CA, 60mm and 81mm mortars were found in this area. This area will be surface cleared, with the exception of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail.
- **Ordnance Operable Unit-7.** OOU-7 is approximately 170 acres located in the vicinity of the Camp Croft State Park office and campgrounds and is the Park's busiest area. OOU-7 shall be subsurface cleared to two feet. During the Time Critical Removal Action (TCRA) and the EE/CA performed on OOU-7, 60mm and 81mm mortars, 2.36 inch rocket parts, and small arms were found.
- **Ordnance Operable Unit 2.** OOU-2 is a 325 acre area located on the east side of the park, approximately 0.7 mile from State Highway 295. Activities performed in OOU-2 are generally limited to recreational surface use which includes hiking and horseback riding. During the EE/CA performed on OOU-2, 60mm and 81 mm mortars, 4.2 inch mortar parts, and small arms were found. OOU-2 shall be surface cleared only, with the exception of the horse trails which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately XX miles long.
- **Ordnance Operable Unit-3.** OOU-3 is located on private residential property. A Mk II hand grenade, practice grenades, and grenade parts and fragmentation were found during the EE/CA. This area is approximately 11 acres and shall be cleared to

a depth of two feet.

- **Area 39.** Area 39 was identified in the Supplemental Archive Search Report as a potential OE area. Work in this area consists of clearance of the horse trails, which shall be cleared to a depth of two feet to include 10 feet on either side of the trail. The horse trails are approximately XX miles long. (The exact length of the horse trails has not be definitely determined.)

1.2 Projected Removal Action Starting Dates

1.2.1 The approximate project start date for Camp Croft is as follows:

Establishing Boundaries: Will commence upon Remedial Action Safety Plan approval

Range Clearance Operations: Will commence upon Remedial Action Safety Plan approval

Projected Removal Action: Project Removal Action completion date will be at a minimum of three months to a maximum of six months after approval of Remedial Action Safety Plan.

1.3 Suspected UXO Items

1.3.1 The type of OE contamination known at this time is listed in Table 1.

OE CONTAMINATION
Table - 1

NAME	MODEL/TYPE	QUANTITY
Small Arms	.30 Caliber	Unknown
Grenade, Hand	MKII (HE)	Unknown
Grenade, Hand	MKII (Practice)	Unknown
60mm Mortar	HE	Unknown
81mm Mortar	HE	Unknown
2.36" Rocket	HEAT	Unknown
4.2" Mortar	Unknown	Unknown

1.4 Hazard Assessment of Migration of Contamination

1.4.1 An assessment of migration of explosive contamination and heavy metals residue is being conducted by another government contractor.

1.4.2 Camp Croft is not a suspected HTRW site. However, if at anytime during site activities personnel encounter suspected HTRW or CWM, personnel will pass the word to evacuate the area either orally or using portable air horns (one long blast). After sounding the alarm, personnel will immediately evacuate the area in an upwind direction and report it to the site Safety Officer. Work will be discontinued in that area until the Project Manager, SUXOS, CEHNC Safety Specialist and HFA's Health and Safety Manager have been notified and the situation evaluated. If HTRW has been identified, intrusive investigation will cease until the WP/SSHP has been revised.

1.5 UXO/OE Contractor

1.5.1 HFA, Inc. has been contracted by the U.S. Army Engineering and Support Center, Huntsville, under contract DACA87-94-D-0019 "Remediation of Various Sites East of the Mississippi River." Task Order 012 has been issued to safely locate, identify, and remove all OE and OE/Non-OE related scrap from selected areas of the Former Camp Croft.

1.6 Demolition Operations

1.6.1 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. Electrical procedures will be employed as the method of choice for all detonations and all demolition shots will be tamped. Electromagnetic radiation (EMR) considerations will be paramount during electrical blasting operations. UXO Supervisors will ensure proper distances between handheld radios and overhead power lines are maintained during demolition operations.

1.6.2 Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an event—such as inclement weather—prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS and the CEHNC Site Safety Specialist are responsible for determining whether or not minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify State Park Police and request security until the UXO can be properly and safely destroyed. HFA personnel will assist State Park Police personnel if necessary.

1.7 Preparation Sequence

1.7.1 The process outlined below will be used to assemble an electric initiation system.

- Test and maintain control of the blasting machine.

- Test the blasting circuit tester.
- Test the firing wire on the reel, shunted and unshunted.
- Lay out the firing wire completely off the reel.
- Retest the firing wire, shunted and unshunted.
- Test the blasting circuit and blasting caps.
- Connect the circuit.
- Connect the firing wire.
- Test the entire circuit.
- Prime the charges.

1.7.2 Testing and Maintaining Control of Blasting Machine

1.7.2.1 The blasting machine will be tested each day as specified in the manufacturer's instructions.

1.7.2.2 The SUXOS or a designated Demolition UXOS for that day's UXO disposal activities is responsible to maintain control of the blasting machine at all times. This responsibility cannot be delegated.

1.7.3 Testing the Blasting Circuit Tester

1.7.3.1 The blasting circuit tester will be tested each day as recommended in the manufacturer's instructions.

1.7.3.2 Both the open-and short-circuit tests will be performed.

1.7.4 Testing the Firing Wire on the Reel

1.7.4.1 The firing wire leads will be separated at both ends and the leads at one end connected to the post of the blasting circuit tester. When using the needle type blasting circuit tester, no deflection should be noted. When using the digital type blasting circuit tester, the number on the digital readout should remain constant.

1.7.4.2 The wires will be shunted at one end and the leads of the other end connected to the blasting circuit tester. When using the needle type circuit tester, the needle should travel at least 50% of the scale. When using the digital type blasting circuit tester, the number should increase to indicate continuity.

1.7.4.3 Both ends of the firing wire will be shunted after testing.

1.7.5 Laying Out the Firing Wire

1.7.5.1 After locating a safe firing position, the wire will be laid out between the firing point and the charge.

1.7.5.2 Vehicles will not drive over and personnel will not walk on the firing wire.

1.7.5.3 The wire will be as short as possible. Loops in the wire will be avoided and it will be laid as flat as possible.

1.7.6 Retesting Firing Wire

1.7.6.1 The open- and short-circuit tests will be performed again. The process of unrolling the wire may separate broken wires not found in previous tests.

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

1.7.6.3 Both ends of the firing wire will be shunted after the tests are complete.

1.7.7 Testing Electric Blasting Caps

1.7.7.1 The cap will be removed from its container. The wire will be wrapped around the palm of the hand twice. This procedure will prevent tension on the cap wires and dropping the cap.

1.7.7.2 The cap wires will be stretched to their full length. Care will be taken not to kink them. The cap(s) will be placed under a sandbag, while stretching out the lead wires.

1.7.7.3 The cap(s) will be tested away from all other personnel. Personnel will keep their backs to the cap when testing it.

1.7.7.4 Cap wires will always be shunted when not being tested.

1.7.8 Connecting a Circuit

1.7.8.1 When two or more blasting caps are required for a dual primed demolition operation, a common parallel circuit will be used. The following procedures will be used:

- All blasting caps will be tested separately before being connected in a circuit.
- The blasting cap wires will be joined together using the Western Union pigtail splice. All joints will be protected in the circuit with electrical tape.
- The entire circuit will be tested. After testing the circuit, the two free ends of the cap wires will be shunted and kept shunted until they are to be connected to the firing wire.

1.7.9 Connecting the Firing Wire

1.7.9.1 The free ends of the blasting caps will be connected to the firing wire before priming the charges or taping a cap to detonating cord.

1.7.9.2 The connections will be insulated with tape.

1.7.10 Testing the Entire Firing Circuit

1.7.10.1 Before priming any charges, the circuit will be tested from the firing point. The following procedures will be used:

- The caps will be placed at least 25 feet from the charge, under protective sandbags, while performing this test.
- The ends of the firing wire will be connected to the blasting circuit tester and when using the needle type tester, the needle should deflect to at least half scale. When using the digital type tester, the number should increase to indicate continuity. (If there is no deflection, the system will have to be checked to locate the break in the circuit.)
- The ends of the firing wire will then be shunted.

1.7.11 Priming the Charges / Returning to the Firing Point

1.7.11.1 HFA will use standard military demolition charges to detonate UXO. HFA UXO Specialists are experienced and knowledgeable in the use of these charges and have used them successfully during previous projects and their military careers.

1.7.11.2 The blasting cap(s) will be connected to a detonating cord trunk line or ring main system.

1.7.12 Initiating the Circuit

1.7.12.1 At this point the ignition system is complete. The blasting machine will not be connected until all personnel are accounted for and perimeter security is verified. The SUXOS, or the 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.

1.8 Detonating UXO in Place

1.8.1 Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1730 hours. All detonations will be conducted in accordance with 60A1-1-31.

1.8.2 Detonations will occur only after all unnecessary personnel have left the area and road guards have been posted.

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

1.8.4 The remaining HFA UXO personnel may act as perimeter security, if requested by the Devens Security force and as directed by the SUXOS.

1.8.5 Notification of detonations will be made in accordance with the Standard Operating Procedures for Notification of UXO Detonations.

1.8.6 During detonations, a designated project vehicle will remain in the area to provide emergency egress for the demolition team.

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

1.8.8 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 ASP and transported to the site.

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

1.8.10 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.

1.8.11 All charges will be initiated electrically. Detonating cord trunk and branch lines will be used to link multiple shots.

1.8.12 Misfire Procedures

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

- The SUXOS will be notified of the time of the suspected misfire; and
- The SUXOS will notify the HFA Project Manager (PM), if on site, and the CEHNC Safety Specialist. All other personnel will be notified of the event via radio and instructed to hold their positions until the "all clear" is given. The circumstances surrounding the misfire will be included in the sites Daily Journal [see *Appendix F HFA Forms*].

1.8.12.2 Electric Misfires

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

1.8.12.2.2 The blasting machine or power source terminals will be checked. The blasting machine or power source will be disconnected and the blasting circuit tested. The continuity of the firing wire will be checked with a circuit tester.

1.8.12.2.3 Another blasting machine or power source will be used to attempt to fire the circuit again. Blasters will be changed and the procedures repeated.

1.8.12.2.4 Thirty minutes will lapse prior to the inspection of an electrical misfire. The entire circuit will be checked for wire breaks or short circuits. If it is suspected that the electric blasting cap is the problem, no attempt will be made to remove or handle the electric blasting cap. A new charge will be assembled and placed next to the misfired charge and detonated.

1.8.12.3 Detonating Cord Misfires

1.8.12.3.1 A new blasting cap will be attached to the remaining detonating cord, with care taken to fasten it properly, and the original charge will be detonated.

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

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

- Investigation will not occur until the charges have stopped burning (30 minutes if the charge is buried).
- The charge will be re-primed and another attempt will be made to detonate the charge.
- Scattered charges that do not contain blasting caps may be collected and detonated together.

1.9 Notification

1.9.1 Notification will take place as outlined in the Standard Operating Procedures for Notification of UXO Operations.

1.10 Transportation of UXO/Demolition Materials On-Site

1.10.1 All movement of explosives and UXO will be escorted by either the SUXOS or SSO.

1.11 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.

1.12 When transporting explosives or UXO, vehicles will not exceed the authorized speed limit. In many areas a prudent speed may be less than 25 mph, in which case the driver may not exceed a safe and reasonable speed.

1.13 Blasting caps and high explosives will remain separated at all times during transport. Suitable metal containers will be used for this purpose. The internal space of the container will be padded and the boxes will be separated by the largest distance possible in the bed of the truck. The containers will remain closed at all times, except when actually using the materials.

1.14 Vehicles hauling UXO will remain covered at all times, except when 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.

1.15 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.

1.16 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS

1.16.1 All explosives and demolition materials will be stored in two earth covered arch type magazines located on state park land. The magazines were previously approved for use during other phases of this project. (The lightning arrestor and grounding systems for these magazines will require re-checking and repairs if necessary.) The SUXOS will be responsible for the safe handling of all explosives.

1.16.2 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. The SUXOS will be responsible for the proper storage, issue, and maintenance of all explosives and explosives' records.

1.16.3 The SUXOS or QC 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 so that information can be included in the final report.

1.16.4 All magazines will be grounded and have lightning protection provided as outlined in DOD 6055-9.

1.17 Establishment of Quantity of Explosives and Fragmentation Distances

1.17.1 The former Camp Croft is unsecured and potential open to the public. The State Park Service property is marked with signs stating that the park is closed to the public during OE operations. UXO Supervisors are relied upon to control their work zones, and to stop all work and report unauthorized persons entering their areas. HFA will provide security in controlling access. The public areas are patrolled by State Park Service Police and necessary streets and roads will be closed if the situation requires it.

1.17.2 All demolition locations will be confined to the boundaries of the sites. There is not a primary demolition site located. Demolition sites will exist where UXOs cannot be moved (blown in place). Detonation of UXO that cannot be moved will occur in the position where they are found. The location of UXO which must be detonated in place cannot be predicted, and they could occur at any point on the site. All UXO that is detonated in place will be well documented and the position indicated on the site map. All demolition shots will be tamped with sand/earth to minimize fragmentation and noise emissions. The following fragmentation distances are in reference to each individual site where potential OE contamination can be found. This fragmentation distance applies only during intrusive activities. During actual demolition operations, the fragmentation distance may be reduced based on the type, size, and quantity of OE being disposed of.

1.17.3 OOU-1B - The fragmentation distance for OOU-1B is based on a 81mm HE mortar. The fragmentation distance is 800 feet (60A-1-1-4) and pertains to the whole site.

1.17.4 OOU-2 - The fragmentation distance for OOU-2 is based on a 4.2" HE mortar. The fragmentation distance is 955 feet (60A-1-1-4) and pertains to the whole site.

1.17.5 OOU-3 - The fragmentation distance for OOU-3 is based on a MKII HE hand grenade. The fragmentation distance is 150 feet (ETL 385-1-1), the safe separation between UXO teams, and pertains to the whole site.

1.17.6 OOU-7 - The fragmentation distance for OOU-7 is based on a 81mm HE mortar. The fragmentation distance is 705 feet (60A-1-1-4) and pertains to the whole site.

1.17.7 Area 39 - The fragmentation distance for Area 39 is based on a 60mm HE mortar. The fragmentation distance is 560 feet (60A-1-1-4) and pertains to the whole site.

1.17.8 Protection of personnel and property are critical elements of any removal operations performed at this site. Engineering controls will be employed during any intrusive activities and/or demolition operations to protect nearby structures and evacuation of residents will be the primary method of protecting people. The location of underground utilities will be determined before excavations or in place detonation occurs via contact the local utilities ("Miss Utility") in locating the buried utilities.

1.17.9 The aluminum shelters used at other HFA sites, will satisfy the engineering control requirements during intrusive activities and tamping of the UXO that are to be detonated in place will be done with sand/earth cover for protection of property.

1.17.10 Due to the sensitive fuzes used in hand grenades, moving them is not a safe option. Therefore, if a situation arises where a UXO can not be detonated in place, the CEHNC Safety Representative will be notified so he can contact the nearest EOD unit for support.

1.17.11 All non-UXO personnel will be evacuated to an area outside of the established fragmentation distance zones. This fragmentation distance only applies during intrusive activities.

1.17.12 All explosives and demolition materials will be stored in two earth covered arch type magazines located on state park land. The magazines were previously approved for use during other phases of this project. (The lighting arrestor and grounding systems for these magazines will require re-checking and repairs if necessary.) The SUXOS will be responsible for the safe handling of all explosives.

1.17.13 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 blasting caps. The type, amount, class and net explosive weight (NEW) stored in the Magazine/Explosive Storage Area (MESA) is listed in Table 2.

1.17.14 Based on DOD 6055.9 STD, DOD Ammunition and Explosives Safety Manual, Table 9-1, the distance in feet to inhabited buildings is 500 feet to the front and 250 feet to the sides and rear. The distance in feet to public traffic route is 300 feet to the front and 150 feet to the side and rear. The following distances are in reference to the two earth-covered located at the MESA on Camp Croft:

- MESA to Public Road (Dairy ridge Road) = Approximately 420 feet.
- MESA to nearest house = Approximately 900 feet.

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.

1.17.15 Due to the site being unsecured, it may become necessary to temporarily close some streets and reroute traffic. This will be determined by the proximity of the UXO to the site boundaries, type and size of UXO, and amount of tamping material (sand/earth) used on the UXO. Local park police will secure public roads. Site control will be maintained by HFA UXO personnel. Road block positions will vary and be coordinated with CEHNC Safety Specialist, and HFA SUXOS.

1.18 Magazine Requirements

1.18.1 Two earth-covered, corrugated steel, arch-type magazines will be used for explosives storage on site. Magazine construction is in accordance with 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.

1.18.2 Property upon which outdoor type magazines are located shall be posted with signs reading "EXPLOSIVES - KEEP OUT," legibly printed thereon in letters not less than three inches high on a reflective surface. Such signs shall be located so as to minimize 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 personnel¹ (indicated by a distinctive symbol in order to be recognized by the fire fighters approaching the fire scene) will be the only sign displayed. For the purpose of 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 of the magazines.

1.18.3 Packages of explosives stored within the magazine shall be laid flat with top up on

¹ - Coordination was made with the local supporting Fire Department during the site visit.

wooden pallets. Corresponding grades or brands shall be stored together in such a manner that brands/grade marks show, they can be easily counted and checked, and are 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.

1.18.4 Smoking, matches, open flames, spark-producing devices, and firearms shall not be permitted inside of 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.

1.19 Lightning Protection

1.19.1 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.

1.19.2 The details of construction and installation of lightning protection systems shall, in general, be in accordance with DOD 6055.9 and DOD 4145.26M and conform with the requirements of National Fire Protection Association (NFPA) Standard No. 78.

1.19.3 There are four types of lightning protection systems acceptable for the protection of structures housing ammunition and explosives. They are overhead wires, masts, integral, and Faraday cage lightning protection systems. The Separately Mounted Shielding System (Mast Type) will be used.

1.19.3.1 The mast-type protection consists of a pole, which, if a nonconducting material, shall be provided with an approved air terminal securely mounted to the top, extending no less than two feet nor more than five feet above the top of the pole and a down conductor shall be run down the side of the pole and be connected to ground electrodes. If a metal pole is used, the pole will act as both the down conductor and a ground. For such systems, air terminals need not be provided and if the resistance of the pole to ground is less than 10 ohms or less, additional grounding is unnecessary. When the resistance exceeds 10 ohms, additional grounding shall be provided and the ground connection shall be securely fastened to the metal pole and the ground.

1.19.3.2 When a ground rod is necessary, it shall be driven approximately six feet from the base of the pole. The grounding rod shall be at least 3/4 inch solid steel or copper and ten feet long, 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, an additional ground rod shall be driven no closer than 10 feet from the first rod.

1.19.3.3 The zone of protection of an air terminal or mast of conducting material is taken as the space enclosed by a cone, which has its apex at the highest point of the rod or mast and a radius at the base which bears a relation to the height. For a mast not exceeding 50 feet in height, the zone defined by a radius of base equal to the height of the rod or mast has been found to be substantially immune to direct strokes of lightning.

1.19.3.4 For mast heights in excess of 50 feet, the zone of protection is based on the striking distance of the lightning stroke. The zone of protection is defined by a circular arc concave upward. The radius of the arc is the striking distance and the arc passes through the tip of the mast and is tangent of adjacent masts.

1.19.3.5 Two magazines may be protected by the same pole provided all parts of these magazines fall within the cone of protection. The mast must be set at a distance from the structure equal to one-third of the height of the building, but in no case shall be less than six feet. Where two magazines are to be protected by the same mast, it shall be placed at least one-third the height of the tallest magazine away from the tallest magazine and at least one-third the height of the shortest magazine from the shortest magazine but not less than six feet from either magazine.

1.19.4 Testing

1.19.4.1 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.

1.19.4.2 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 in accordance with the appropriate instrument manufacturer's instructions, by personnel familiar with lightning protection systems.

1.19.4.3 Test Equipment - Only those instruments designed for earth-ground system testing are acceptable. The instrument must be able to 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
Electric Blasting Caps	1.1	50 ea.	Less than 1lb	B
Jet Perforators (Shape Charge)	1.4S	80 ea	6.0lbs	D
Detonating Cord (50 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 Class II Magazine		Distance in Feet to Public Traffic Route from Class II Magazine	
Over	Not Over	Front/Side	Rear	Front/Side	Rear
10lbs	20lbs	500	250	300	150

1.20 Hazardous Assessment and Mitigation

1.20.1 Precautions to be taken if hazardous, toxic, and radioactive waste or chemical warfare material are encountered are in accordance with the Site-Specific Safety and Health Plan, Section 2.

1.20.2 The only known contamination in respect to the site might possibly be the explosive residue from demolition materials and explosive fillers from the UXOs. The potential for migration of any explosive residue contamination is not anticipated and will not be sample for.

1.21 Off-Site Disposal Plan

1.22 No off-site disposal will take place during this Task Order.