WORK PLAN

00458

21

FOR THE

ORDNANCE AND EXPLOSIVES REMOVAL ACTION

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

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OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
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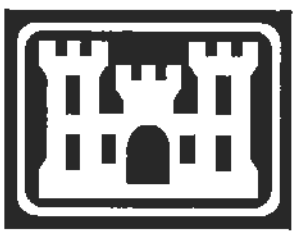
VOLUME II

STATEMENT OF WORK

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:



The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

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10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

This appendix contains the SOW for contract number DACA87-97-D-0005, Task Order 0003, for the Open Burning Grounds, Seneca Army Depot Activity, Romulus, New York.

STATEMENT OF WORK
ORDNANCE AND EXPLOSIVES (OE) REMOVAL ACTION
AT THE OPEN BURNING (OB) GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

23 JUNE 1997

1.0 BACKGROUND AND GENERAL STATEMENT OF WORK: The work required under this Scope of Work (SOW) falls under the Base Realignment and Closure Act (BRAC) of 1995. Ordnance and Explosives (OE) contamination exists on property 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 OE encountered. This action will be performed in accordance with (IAW) the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA), Section 104, and in substantive compliance with the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required.

1.2 Ordnance and explosives found during this removal action fall under the applicable provisions of 29CFR 1910.120.

1.2.1 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).

1.3 GENERAL DESCRIPTION. SEDA is a US Army facility located in Seneca County, New York. SEDA occupies approximately 10,600 acres. It is bounded on the west by State Route 96A and on the east by State Route 96. The cities of Geneva and Rochester are located to the northwest (14 and 50 miles, respectively); Syracuse is 53 miles to the northeast and Ithaca is 31 miles to the south. The surrounding area is generally used for farming. The OB Grounds is an approximately 30 acre site located in the northwestern section of the installation.

1.4 REGULATORY STATUS. The OB Grounds site was included on the Federal Facilities National Priorities List on 13 July 1989. Consequently, all work to be performed under this contract shall be performed according to Comprehensive Environmental Response Compensation and Liability Act (CERCLA) guidance as put forth in the EPA Interim Final "Guidance for Conducting Remedial Investigations/ Feasibility Studies under CERCLA", (Reference 8.1) and the "Federal Facility Agreement under CERCLA Section 120 in the matter of Seneca Army Depot, Romulus, New York," (Reference 8.4).

1.5 DEFINITIONS: Definitions of applicable terms are found in Section C, paragraph 2.3, of the Basic Contract.

1.6 SECURITY REQUIREMENTS. Compliance with SEDA security requirements is mandated. Thes requirements are presented in Section

2.0 OBJECTIVES: - To safely locate, identify, and dispose of all OE within the pad berms and the low-lying hill area of the site.

- To safely locate, identify, and dispose of all surface and subsurface OE at the site to a depth of two (2) feet.

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 3 days including travel time, is authorized. The site visit team shall not exceed three persons. The contractor shall notify the CEHNC Project Manager (Ms. Dorothy Richards) of the proposed dates for the site visit at least 10 calendar days prior to the visit. The site visit shall include coordination with the appropriate agencies to include local medical facilities, local airfield,etc., and the BRAC Environmental Coordinator (BEC). 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 (ASSHP) IAW Appendix B, Standing Operating Procedures (SOP) for Site Safety and Health Plans (SSHP), dated 26 May 1994, prior to the site visit. This plan shall be submitted to the CEHNC-OE-DC for approval at least five (5) days prior to conduct of the site visit.

3.1.2 DISPOSAL ALTERNATIVES: Based on the site visit, the contractor shall provide alternatives for disposal, and recommend the safest and most cost-effective method for treatment and disposal of OE. The contractor shall

provide three disposal alternatives IAW Section C, paragraph 3.3, and Data Item Description (DID): OT-040, of the Basic Contract.

3.1.3 PREPARE WORK PLAN: The WP shall be prepared IAW Section C, paragraph 3.4 and DID: OT-005 of the Basic Contract. All UXO operations shall comply with *CEHNC Safety Concepts and Basic Considerations for UXO*, dated 16 February 1996. The following subplans are not required: Air Monitoring Plan and Chemical Data Acquisition Plan (CDAP).

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

3.1.3.2 The Work Plan shall include the following subplans written IAW DID-005 of the Basic Contract.

a. UXO Operational Plan, which will incorporate the Technical and Management Plan, without duplicate effort or information.

b. Site Safety and Health plan (SSHP). The contractor shall submit an SSHP IAW 29 CFR 1910.120 that contains OE safety standards and procedures.

c. Geophysical Equipment Plan (GEP). The contractor shall prepare and submit a detailed GEP describing the equipment to be employed to perform all necessary operations. Subdivisions within the Geophysical Equipment Plan shall include:

1. Sensors: such as, type of sensor and configuration
2. Sensor Mobility: such as, type of mobility (e.g. man portable, vehicle towed), speed, special considerations,
3. Data Storage: such as, sensor internal storage, external storage and any special data transfer requirements shall be addressed.

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

e. Location Survey and Mapping Plan, as detailed in DID-020.

f. Environmental Protection Plan.

g. Quality Control Plan

h. Work, Data and Cost Management Plan.

3.2 (TASK 2) COMMUNITY RELATIONS

3.2.1 The contractor shall assist in the conduct of public meetings as required IAW Section C, paragraphs 3.6 and 4.0, and DID: OT-045 of the Basic Contract.

3.2.2 All press releases and media appearances shall be coordinated with, and approved by, the Public Affairs Office (PAO), Seneca Army Depot Activity, and the PAO at the U.S. Army Engineering and Support Center, Huntsville (CEHNC).

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 3.4, and as directed in Section C, paragraph 3.5.5, and DID: OT-020 of the Basic Contract. UXO safety requirements are detailed in DID: OT-020 and any decision to relax the requirements shall be made jointly by the SSHO and the USACE on-site Safety Specialist. 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. The below-ground depth of all UXO shall 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.

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

3.3.2.1 A tabulated list of the respective grid corners for all grids being cleared in the areas described in Section 3.3 of this SOW.

3.3.2.2 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:

3.3.2.2.1 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.

3.3.2.2.2 The Government shall be provided with a copy of the design files on 8 mm 5.0 or 10.0 gigabyte magnetic tapes, 3 ½-inch @ 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) UNEXPLODED ORDNANCE REMOVAL. This task shall be accomplished IAW Section C, paragraphs 3.5 and 3.7, of the Basic Contract.

3.4.1 General.

3.4.1.1 The contractor shall furnish all necessary personnel and equipment to perform a surface and subsurface clearance of all UXO on the project site as specified below. This action shall include all OE scrap.

3.4.1.2 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.

3.4.1.3 Only USAESCH approved UXO personnel shall perform UXO procedures.

3.4.1.4 The contractor shall maintain a detailed accounting of all UXO items/components 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.

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

3.4.1.6 The contractor shall recommend to USAESCH the most appropriate detection equipment for the OE items suspected at this site. During the subsurface operation the subsurface detection equipment shall be capable of detecting ferrous and non-ferrous metallic OE items to a depth of 2 feet. The contractor shall dig to a depth of two feet to identify all geophysical anomalies. The on-site USAESCH Safety Specialist may approve deeper excavations (such as for burial pits and trenches) if he determines it necessary.

3.4.1.7 The chosen detection equipment shall be field tested daily to ensure that it is operating properly. This shall be accomplished by burying an inert Rifle Grenade (M31, HEAT, or similar, inert item) at two feet, and an inert Hand Grenade (Fragmentation, MK2 Series, or similar, inert item) at one foot

to determine the standard indication. If the detection equipment does not meet the standard during the daily check, it shall be recalibrated, repaired or replaced.

3.4.1.8 All recovered OE shall be disposed of daily.

3.4.1.9 The contractor shall plan to provide demolition materials for disposal of OE items and storage facilities for demolition materials. This shall be outlined in the WP.

3.4.1.10 If an excavation is required in an area of endangered/ protected plant or animal, excavation shall proceed only after approval by appropriate installation personnel.

3.4.1.11 All access/excavation/detonation holes shall be backfilled to grade and reseeded with indigenous grass.

3.4.2 PERFORM ORDNANCE AND EXPLOSIVES (OE) REMOVAL AT THE SENECA ADA OB GROUNDS. The Seneca OB Grounds encompasses approximately 30 acres (see ATTACHMENT 1). Items that were burned at the site are included in ATTACHMENT 2 to this SOW. OE removal activities shall consist of the following:

o perform UXO clearance of all soil currently stockpiled on the site. These stockpiles consist of the area known as the "low-lying hill" and the berms surrounding each individual burn pad.

o perform a UXO surface and subsurface clearance over approximately 30 acres of the site. The subsurface clearance shall be performed to a depth of two feet.

3.5 (TASK 5) TURN IN OF RECOVERED INERT OE-RELATED SCRAP. The contractor shall furnish all necessary personnel and equipment to turn in all recovered inert Ordnance Items and OE scrap metal. The methodology to accomplish this task shall be proposed in the work plan.

3.5.1 Inert ordnance items shall be vented IAW *Safety Concepts and Basic Considerations* prior to turn in.

3.5.2 If a local DRMO is unavailable or if one is available but is unwilling to accept scrap, the contractor shall utilize locally available resources for disposal of scrap. The contractor shall complete a DD Form 1348-1 as turn-in documentation. Instructions for completion of this form are contained in the

Defense Utilization and Disposal Manual, DoD 4160.21-M. 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."

3.5.3 Turn-in documentation receipts shall be submitted as a component of the Removal Report.

3.6 (TASK 6) PERFORM QUALITY CONTROL:

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

3.6.2 If UXO is located within a grid during the UXO Quality Assurance (QA) search, the contractor will be required to search the entire grid again.

3.7 (TASK 7) PREPARE AND SUBMIT REMOVAL REPORT: At the conclusion of all field activities, the contractor shall submit the Removal Report IAW DID: OT-030 of the Basic Contract. In addition, the following information shall be submitted:

3.7.1 All original surveying and mapping data from Task 3.

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

3.7.3 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.

3.7.4 Scrap turn-in documentation.

3.7.5 A minimum of 20 color photographs.

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

3.7.7 A written record of all endangered or threatened 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 IAW Section C, paragraph 3.8, and DID: OT-025 of the Basic Contract. The resumes shall be included in the WP for approval by the Contracting Officer. If UXO personnel are substituted at the project site, their resumes shall be approved by the Contracting Officer prior to their movement onto the site.

3.8.1 Training and medical screening IAW 29 CFR 1910.120(e) is required for this project. Annual physicals shall be accomplished prior to arrival on site.

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. One copy of the final WP and the final report shall be sent to the CEHNC Project Manager on 3.5 inch computer disk or CD ROM in an acceptable format in addition to the number of hard copies identified below. 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-DC (Ms. Dorothy Richards) P.O. BOX 1600 Huntsville, Alabama 35807-4301	10
US Army Engineering and Support Center, Huntsville ATTN: CEHNC-CT-S (Ms. Kara Hetrick) P.O. BOX 1600 Huntsville, Alabama 35807-4301	1
US Army Engineer District, New York ATTN: CENAN-PP (Mr. Randy Battaglia) Seneca Army Depot Activity Romulus, New York 14541	2

Commander,
Seneca Army Depot Activity 10
ATTN: SIOSE-BEC (Mr. Steve Absolom)
Seneca Army Depot Activity
Romulus, New York, 14541

Commander 1
52nd Explosive Ordnance Disposal (EOD) Group
ATTN: S-3
Building 736, Fort Gillem
Forest Park, Georgia 30050-5000

4.1 Submittals and Due Dates:

Data Item	Submittal	Due Date
OT-040	Disposal Feasibility Letter	5 workdays after site visit
OT-005	Draft Work Plan	30 workdays after approval of Disposal Letter
OT-005	Final Work Plan	10 workdays after receipt of draft WP comments
OT-030	Draft Removal Report	30 calendar days after completion of field work
OT-030	Final Removal Report	30 calendar days after receiving review comments

5.0 SECURITY REQUIREMENTS.

5.1 Security Regulations. The following requirements must be followed by the contractor at Seneca Army Depot to facilitate entry and exit of contractor employees and to maintain security.

5.1.1 Personnel Registration.

5.1.1.1 A list of all contractor employees, subcontractors and suppliers indicating firm name and address will be furnished through POC/COR to the Counterintelligence Division, Building 710, 72 hours prior to commencement of work.

5.1.1.2 A confirmation of employment SDSSE-SC Form 268 will be executed by the contractor concerning each employee, to include all subcontractors and their personnel. No forms will be transferred to another file if the contractor has other on-going contracts at SEDA. The contractor will provide a list of personnel who are authorized to sign Form 268 for the firm. A sample of each signature is required. Counterintelligence Division must be notified, in writing, of any changes to this list. All completed forms will be provided through COR/POC to the Counterintelligence Division 72 hours prior to commencement of work. Failure to complete Form 268 correctly will result in employee's denial of access to Seneca. The Counterintelligence Division must be notified, in writing through POC/COR to Counterintelligence, at least 72 hours prior to requesting any action. The chain of command for all contractor actions will be through POC/COR to Counterintelligence Division. There will be no exceptions.

5.1.1.3 Camera permits require written notice from the POC/COR prior to access. Open camera permits will not be issued. The following information is required:

(a) Camera make, model and serial number.
(b) Contract name and name of individual responsible for the camera.
(c) Dates camera will be used.
(d) Where it will be used.
(e) What will be photographed and why.

5.1.1.4 If a rental, leased or privately owned vehicle is required in place of a company vehicle, the following information is needed:

(a) Name of individual driving.
(b) Year, make, model, color and license plate of the vehicle.
(c) Typed letter on company letterhead indicating that the company assumes responsibility for rental, leased or privately owned vehicles.

5.1.1.5 All access media will be destroyed upon expiration date of contract. If an extension is required, a list of employee names and new expiration data must be furnished to the Counterintelligence Division. Contract extensions must be made prior to the contract expiration data or new Form 268s will be required for each individual that requires an extension.

5.1.2 Traffic Regulations.

5.1.2.1 Traffic laws, State of New York, apply with emphasis on the following regulations.

5.1.2.2 Speed Limit: Controlled Area as posted
Ammo Area - 5 mph
Limited/Exclusion Area - 25 mph

5.1.2.3 All of the above are subject to change with road conditions or as otherwise posted.

5.1.3 Parking. Contractor vehicles (trucks, rigs, etc.) will be parked in areas designated by the director of Law Enforcement and Security. Usually parking will be permitted within close proximity to the work site. Do not park within 30 feet of a depot fence, as these are clear zones.

5.1.4 Gates.

5.1.4.1 Post 1, Main Gate - NY Highway 96, Romulus, New York is open for personnel entrance and exit 24 hours daily, 7 days a week.

5.1.4.2 Post 3, Entrance to North Depot Troop Area, located at end of access road from Route 96-A is open 7 days a week for personnel and vehicle entrance and exit.

5.1.5 Security Regulations.

5.1.5.1 Prohibited Property.

5.1.5.1.1 Cameras, binoculars, weapons and intoxicating beverages will not be introduced to the installation, except by written permission of the Director/Deputy Director of Law Enforcement and Security.

5.1.5.1.2 Matches or other spark producing devices will not be introduced into the Limited/Exclusion or Ammo Area' except when the processor of such items is covered by a properly validated match or flame producing device permit.

5.1.5.1.3 All vehicles and personal parcels, lunch pails, etc. are subject to routine security inspections at any time while on depot property.

5.1.5.1.4 All building materials, equipment and machinery must be cleared by the Director of Engineering and Housing who will issue a property pass for outgoing equipment and materials.

5.1.6 Contractor Employee Circulation.

5.1.6.1 Contractor employees are cleared for entrance to the location of contract work only. Sight-seeing tours or wandering from the work site is NOT AUTHORIZED.

5.1.6.2 Written notification will be provided to the Counterintelligence Division (Ext. 30202) at least 72 hours prior to overtime work or prior to working on non-operating days.

5.1.6.3 Security Police (Ext. 30448/30366) will be notified at least two hours in advance of any installation or movement of slow moving heavy equipment that may interfere with normal traffic flow, parking or security.

5.1.7 Unions. Representatives will be referred to the depot Industrial Labor Relations Officer (Ext. 41377).

5.1.8 Offenses. (Violations of law or regulations.)

5.1.8.1 Minor. Offenses committed by a contractor personnel which are minor in nature will be reported by the Director of Law Enforcement and Security to the Contracting Officer who in turn will report such incidents to the contractor for appropriate disciplinary action.

5.1.8.2 Major. Serious offenses committed while on the installation will be reported to the FBI. Violators may be subject to trial in Federal Court.

5.1.9 Explosive Laden Vehicles.

5.1.9.1 Vehicles such as vans, cargo trucks, etc., carrying explosives will display placards or signs stating "EXPLOSIVES."

5.1.9.2 Explosive ladened vehicles will not be passed.

5.1.9.3 When an explosive laden vehicle is approaching, pull over to the side and stop.

5.1.9.4 When catching up with an explosive laden vehicle, slow down and allow that vehicle to remain at least 100 feet ahead.

5.1.9.5 When approaching an intersection where an explosive laden vehicle is crossing - STOP - do not enter the intersection until such time as the explosive carrier has passed through and cleared the intersection.

5.1.9.6 When passing a vehicle that is parked and displaying "Explosive" signs, slow down to 10 miles per hour and take every precaution to allow more than ample clearance.

5.1.10 Clearing Post. All contractor employees are required to return all identification badges and passes on the last day of employment on the depot. The contractor is responsible for the completion of all turn-ins by his employees and informing the Counterintelligence Division and the depot organization administering the contract, for termination of any employee's access to the depot.

6.0 PUBLIC AFFAIRS: The contractor shall conduct Public Affairs activities IAW Section C, paragraph 4.0, of the Basic Contact. All agencies and/or individuals requesting information concerning the conduct of operations at the project site shall be referred to the Seneca Army Depot Activity, Public Affairs Office (PAO) or the U.S. Army Engineering and Support Center, Huntsville, PAO.

7.0 REFERENCES: In addition to references listed below, those cited in Section C, paragraph 5.0, of the Basic Contract apply:

7.1 AR 200-1, Environmental Protection and Enhancement.

7.2 AR 385-40 with USACE Supplement.

7.3 AR 405-90, Disposal of Real Estate

7.4 DA Pam 385-64, dated August 1993

7.5 TM 60A 1-1-31, Explosive Ordnance Disposal Procedures.

7.6 Explosive Safety Policy Memorandum 1-95, dated August 1995

7.7 Explosive Safety Policy Memorandum 2-95, dated August 1995

7.8 Draft-Final Proposed Remedial Action Plan (PRAP) for the Open Burning (OB) at the Seneca Army Depot Activity (SEDA), dated January 1997.

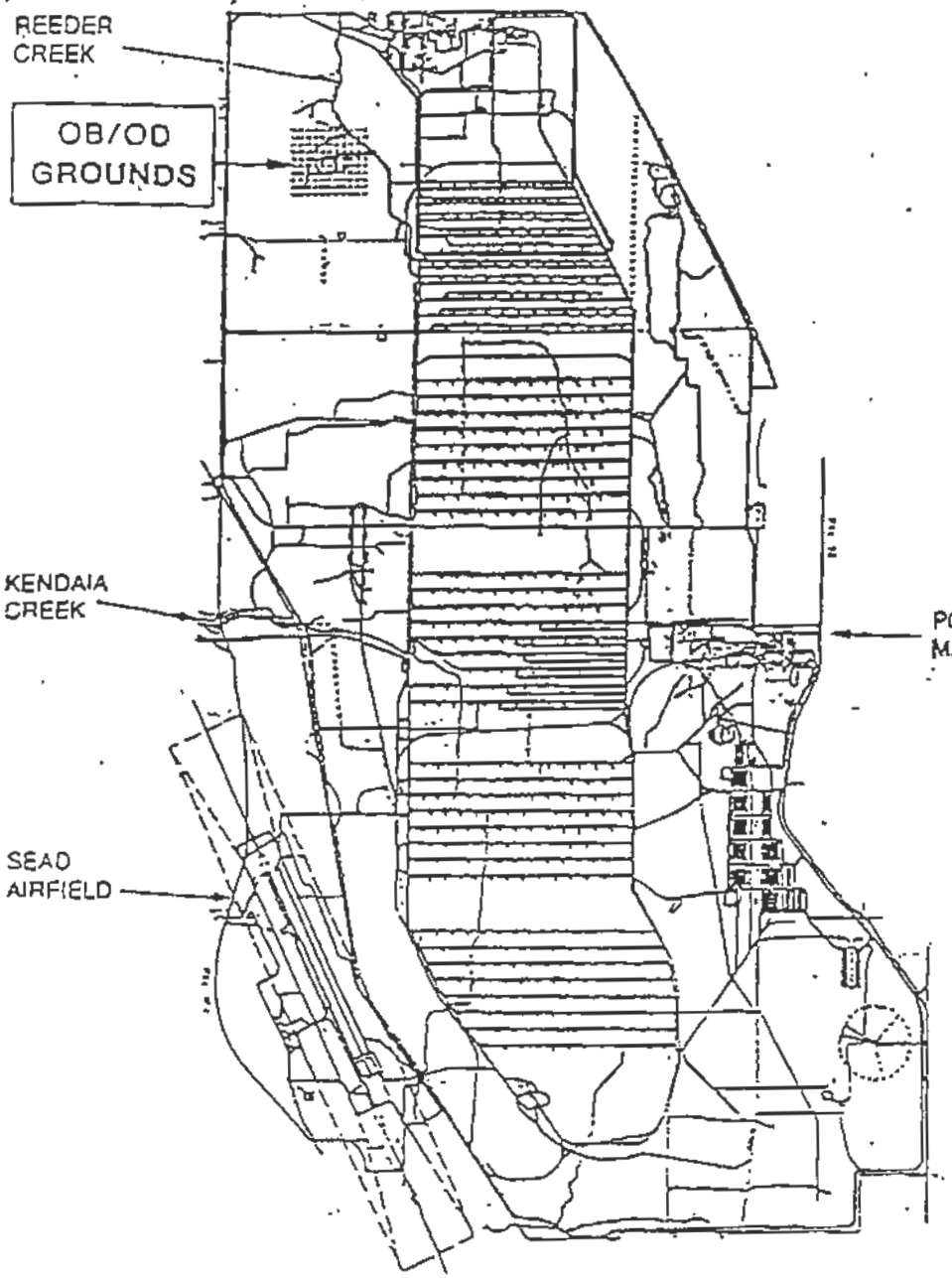
7.9 Pre-Draft Record of Decision (ROD) for Seneca Army Depot Activity, Open Burning (OB) Grounds, dated March 1997.

7.10 Final Remedial Investigation Report at the Open Burning (OB) Grounds at Seneca Army Depot Activity, dated March 1994.

7.11 Standing Operating Procedure (SOP) for Site Safety and Health Plans (SSHP), dated 26 May 1994.

ATTACHMENT 1

Maps



ES
ENGINEERING-SCIENCE, INC.

SENECA ARMY DEPOT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OPEN BURNING GROUNDS

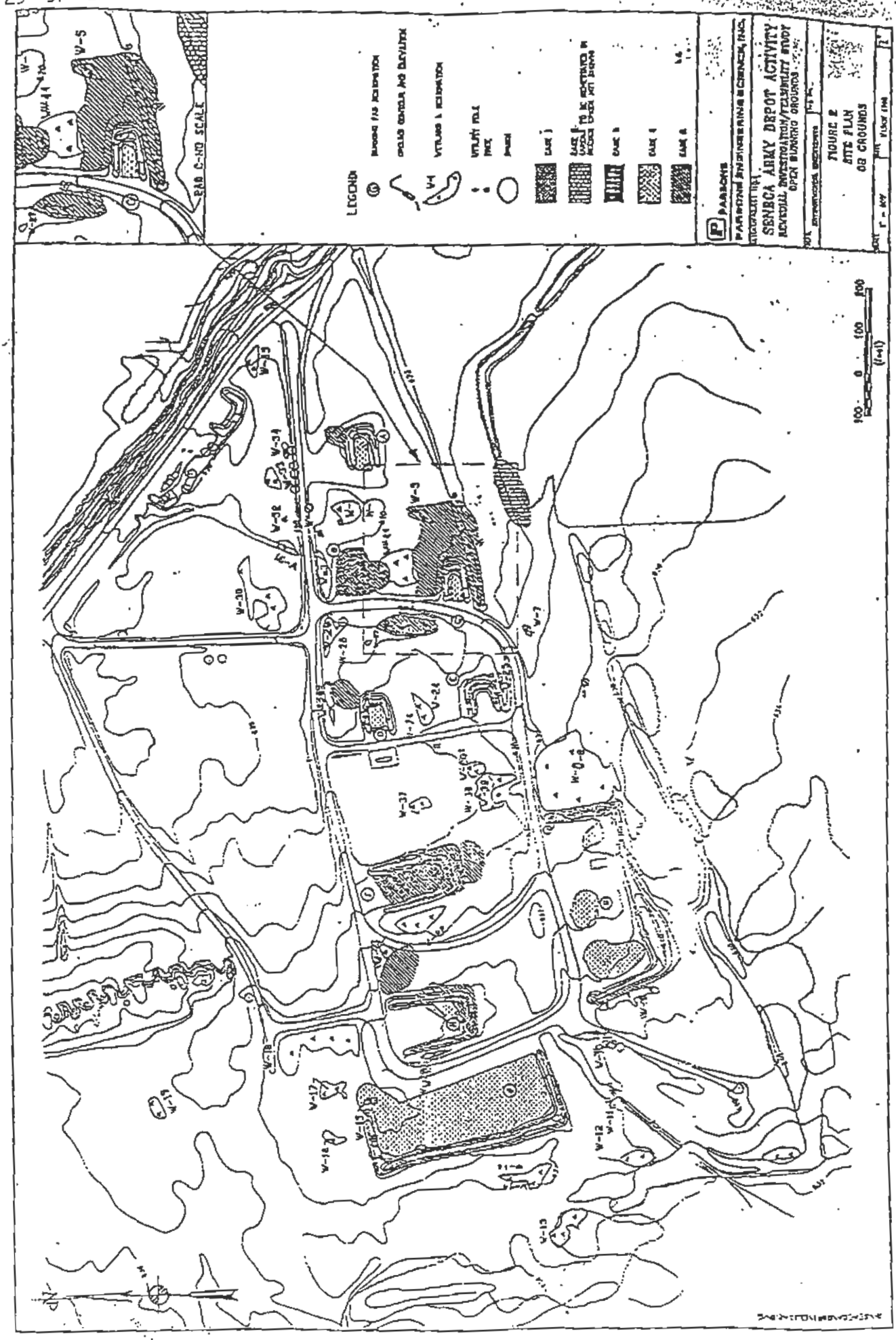
ENVIRONMENTAL ENGINEERING | 720446-01008

FIGURE

SENECA ARMY DEPOT MAP

SCALE: 1" = 2000' (APPROXIMATE)

SOURCE: Seneca Army Depot


LEGEND
SENECA ARMY DEPOT ACTIVITY
FIGURE 2
SITE PLAN
OB GROUNDS
PARSONS

ATTACHMENT 2

List of Demilled Items

73-1-228	Burster, M14
73-1-197	Burster, M19
73-1-202	Burster, M21
73-1-215	Burster, M23
73-2-21	Burster, M24
797832	Burster, M55
73-1-264	Burster, M57
75-1-258	Burster, M40 Series
73-1-226	Burster, M41
73-1-230	Burster, M47
8886484	Burster, M48
8861032	Burster, M71
8434390	Cam, Catapult, Firing
H22-47-18	Cap, Blasting Electric
H22-47-14	Cap, Blasting Electric

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
A18-60-255	Cap, Blasting, Electric, Commercial #6
H22-47-05	Cap, Blasting, Electric, #8
Spec. AXS 1234	Cap, Blasting, Electric, #8, 1st, 2nd, 3rd and 4th Delay
8830972	Cap, Blasting, Electric, J2, PETN Type 2 and M6
8830948	Cap, Blasting, Nonelectric J1, PETN, RDX Type 1 and M7
MIL-C-4546	Cap, Blasting, Nonelectric #6 and 8
MIL-C-20496	Cap, Blasting, Nonelectric Tetryl Type A
TA96713	Cartridge, Activating Device
LD 491836 (Navy)	Cartridge, Activating Device, MK 17, Mod 0
300051-1	Cartridge, Powder Actuated
841155	Cartridge, Aircraft, Fire Extinguisher
398796 (Navy)	Cartridge, Bomb, Ejection, MK1, Mod 2 and 3
[illegible]008	Cartridge, Bomb, Ejection, MK2, Mod 0
[illegible]-31-1	Cartridge, Bomb, Ejection, M3
[illegible].1-2 (Air Force)	Cartridge, Bomb, Ejection, ARD 863-1
TA97155	Cartridge, Cutting Blade
8886478	Cartridge, Delay, XM352
PC 3001	Cartridge, Delay - Hi - Shear Corp.
300-33 (Air Force)	Cartridge, Engine Starter, MXU419 and

MIL-C-27658	Cartridge, Engine Starter, MXU 129A
10622246	Cartridge, Explosive
8026-001	Cartridge, Igniter, Turbojet Engine Type 2
9851	Cartridge, Ignition, M2
92287	Cartridge, Ignition, M2A2
-19-78	Cartridge, Ignition M5A1
75-19-71	Cartridge, Ignition, M6
75-19-79	Cartridge, Ignition, M8
75-19-82	Cartridge, Ignition, M66
1283661 (Navy)	Cartridge, Impulse, MK2, Mod 1.
1013-40 (Navy)	Cartridge, Impulse, MK24, Mod 0
2518426 (NAVAIR)	Cartridge, Impulse, MK131MOD 0
75-1-227	Cartridge, Impulse, M2SA1
75-1-280	Cartridge, Impulse, M29A2
75-1-288	Cartridge, Impulse, M30
75-1-290	Cartridge, Impulse, M31A1
BLX1-95-1-11	Cartridge, Impulse, M56
8594084	Cartridge, Impulse, M57
8595295	Cartridge, Impulse, M67
185079	Cartridge, Impulse, MK104, Mod 0
10521610	Cartridge, Impulse, M141
10521960	Cartridge, Impulse, M150

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
FB 51831	Cartridge, Impulse, M151
1283660	Cartridge, Impulse, ARD 446-1
9311660	Cartridge, Impulse, M796
95-1-15	Cartridge, Initiator, M38
95-1-22	Cartridge, Initiator, M46
8593274	Cartridge, Initiator, M70
8594157	Cartridge, Initiator, M73
9465	Cartridge, Initiator, M91
8593512	Cartridge, Initiator, M93
58D46856 (Air Force)	Cartridge, Kit, Bomb
61D14986 (Air Force)	Cartridge, Kit, Parachute
6RS2C3268	Cartridge, Line Throwing Device
2434364	Cartridge, Mine Safety Appliance
78-0-114	Cartridge, Photo Flash, M112 Series
78-0-132	Cartridge, Photo Flash, M121 Series
78-0-134	Cartridge, Photo Flash, M123 Series
78-0-137	Cartridge, Photo Flash, M124 Series
Commercial Cartridge, Powder Actuated Tool, Cal .22 and Cal .50	
P822S7AK	Cartridge, Release Cargo, Parachute, 1.0 sec delay
8058662	Cartridge, Release Cargo, Parachute, 2.0 sec delay
Commercial Cartridge, Set, Escape System-4, MK2	
S-1-17	Cartridge, Thruster, M42
FF7365	Cartridge, Thruster, M43
FF7367	Cartridge, Thruster, M44
596708	Cartridge, Thruster, M94
D20674	Cartridge, Thruster, M119
8797470	Cartridge, Thruster, T238
82-0-158	Charge Assembly, Demolition, M37
9216416	Charge Assembly, Demolition, M183
83-0-93	Charge, Demolition Block, M2 and M3
P84025	Charge, Demolition Block, M5
82-13-9	Charge, Demolition Block, M5A1
117476	Charge, Demolition Block, M112
117651	Charge, Demolition Block, M118
87971113	Charge, Demolition Block, 1/4-lb TNT
82-13-24	Charge, Demolition Block, 1/2-lb and 1-lb TNT
MIL-E20308	Charge, Demolition Block, 1-lb Nitro-Starch
P84857	Charge, Demolition Chain, M1
D4306-5-1	Charge, Demolition Linear, Component of Demo Kit, M2
D5234-6	Charge, Demolition Linear, Component of Demo Kit, M2A1 and M
82-13-23	Charge, Demolition Linear, Component Expl. Kit, Earth Rod
D5803	Charge, Demolition, Shaped, M2A1
82-0-120	Charge, Demolition, Shaped, M2A3
4025	Charge, Demolition, Shaped, M3
D2843	Charge, Demolition, Shaped, 10-lb
8837975	Charge, Demolition, Shaped, 40-lb

SOP NO. SE-0000-H-005

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
82-15-26	Charge, Practice, M8 Mine
71-9-237	Charge, Propelling, Earth Rod, M12
D4014-1	Cord, Detonating - Fuse, Primacord PETN
8837262	Coupling Base, Firing Device
82-0-126	Cutter, Powder Actuated, Cable M1
82-0-159	Cutter, Powder Actuated, Line M2, M2A1, M21 and M22 Series
None	Demolition Equipment Set, Expl Initiating, Electric and Non-Electric
82-0-84	Demolition Kit, Bangalor Torpedo, M1A1 No. 1, 2, 5 and 7
8796266	Demolition Kit, Projected Charge, M1 Series
D4306-1 thru 6	Demolition Kit, Projected Charge, M2
D5234-1 thru 12	Demolition Kit, Projected Charge, M2A1 and M3
274935 (Navy)	Destructor, Explosive, MK2 Mod 0
82-0-209	Destructor, Explosive, Universal, M10
85355	Destructor, Explosive, M19
10-3137	Destructor, Explosive Type 131
73-9-104	Detonator Kit, Concussion, M1
7[illegible]-9-110	Detonator, Percussion, M1A2
[illegible]909	Detonator, Percussion, M2A1
M[illegible]-D-45413	Dynamite, Military, M1
[illegible] 546	Expendable Firing Package
None	Explosive Kit, Earth Rod, Set No. 1
58AH5989	Explosive Kit, Parachute
D9981-1	Fastener Unit, Powder Actuated Tool
8246784	Firing Device, Delay, M1
8797612	Firing Device, Pull Type, M1
D3961-1-2	Firing Device, Release, M1
73-9-70	Firing Device, Pressure Type, M1A1
73-9-100	Firing Device Pull Type, M2
8837267	Firing Device, Pull Release, M3
9296865	Firing Device, Demolition, Multipurpose M5
8247437	Firecracker, M80
8434390	Firing Mechanism Assembly
364790 (Navy)	Flare, AC, Parachute, MK6, Mod 6
364663 (Navy)	Flare, AC, AN-MK8 Mod 2
78-0-07	Flare, AC, Parachute, M8A1
78-0-11	Flare, AC, Parachute, M9A1
78-0-29	Flare, AC, Parachute, M26 Series
78-0-45	Flare, Surface, Trip, M48
8311625	Flare, Countermeasure, M206

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
8836957	Flare, Surface, Trip, M49 Series
78-0-44	Flare, Tow Target, M50
78-0-93	Flare, Surface, Airport M76
78-0-95	Flare, AC, Towed, M77, M78 and M79
78-0-153	Flare, AC, Parachute, M138 and M139
78-0-94	Fusee, Red, 20 minute, M72
2506736 (Navy)	Fuze, Auxiliary Detonating, MK396 Mod 0
2512190 (Navy)	Fuze, Auxiliary Detonating, MK935 Mod 1
73-2-168	Fuze, Base Detonating, M42 Series
73-2-178	Fuze, Base Detonating, M66 Series
73-2-181	Fuze, Base Detonating, M68 Series
73-2-259	Fuze, Base Detonating, M91 Series
73-9-17	Fuze, Base, Bullet Impact M
82-1-31	Fuze, Hand Grenade, M6 Series
82-1-46	Fuze, Hand Grenade, M10 Series
13-10-22	Fuze, Hand Grenade, M201 Series
7548570	Fuze, Hand Grenade, M204, M205 and M206 Series
8822131	Fuze, Hand Grenade, M213
10963447	Fuze, Hand Grenade M217
9235210	Fuze, Hand Grenade, Practice, M228
399141 (Navy)	Fuze, MK 177 Mod 0
73-7-29	Fuze, Mechanical Time, M43 Series
73-7-71	Fuze, Mechanical Time, M61 Series
D 165255	Fuze, Mechanical Time, MK 61 Mod 1
-7-97	Fuze, Mechanical Time, M67 Series
73-7-97	Fuze, Mechanical Time, 208 MK3 (British)
-7-110	Fuze, Mechanical Time, 214 MK1 (British)
052291	Fuze, Mechanical Time, M565
73-7-135	Fuze, Mechanical Time & Superquick M500 Series
73-7-136	Fuze, Mechanical Time & Superquick, M501 Series
73-7-98	Fuze, Mechanical Time & Superquick, M502 Series
8596001	Fuze, Mechanical Time & Superquick, M548 Series
10534286	Fuze, Mechanical Time & Superquick, M564
Series	
73-9-13	Fuze, Mine, Combination, M6 and M7 Series
73-9-56	Fuze, Mine, Combination, M10A1
73-9-26	Fuze, Mine, AT, Practice, M12
73-9-55	Fuze, Mine, AT, M603
73-9-86	Fuze, Mine, AT, M604
73-2-311	Fuze, Point Detonating, M8
73-2-312	Fuze, Point Detonating, M9
73-2-140	Fuze, Point Detonating, M48 Series
73-2-145	Fuze, Point Detonating, M51 Series
73-1-161	Fuze, Point Detonating, M52 Series
73-2-137	Fuze, Point Detonating, M57 Series

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
73-2-214	Fuze, Point Detonating, M78 Series
73-2-251	Fuze, Point Detonating, M81 Series
73-1-195	Fuze, Point Detonating, M82 Series
73-2-374	Fuze, Point Detonating, T254 Series
73-2-320	Fuze, Point Detonating, M503 Series
73-2-359	Fuze, Point Detonating, M508 Series
73-2-393	Fuze, Point Detonating, M519 Series
9311100	Safety and Arming Device, Guided Missile XM143
11711435	Fuze, Electronic Time, M587
11711268	Fuze, Electronic Time, M724
125510000	Fuze, Electronic Time, M762
12550850	Fuze, Electronic Time, M767
9226650	Fuze, PIBD, XM579
8797514	Fuze, Point Detonating, M524E1 NOTE: This SOP does not apply to the basic model Fuze, M524
8800197	Fuze, Point Detonating, M525 Series
73-2-393	Fuze, Point Detonating, M526 Series
73-1-195	Fuze, Point Detonating, M527 Series
73-2-141	Fuze, Point Detonating, M535 Series
8863535	Fuze, Point Detonating, M557 Series
8880696	Fuze, Point Detonating, M572
9258605	Fuze, Point Detonating, M739
[illegible] 5332	Fuze, Point Detonating, M739A1
[illegible] 2-236	Fuze, Point Initiating, M90 Series
[illegible] 9735	Fuze, Point Initiating, Base Detonating, M509 Series
779525	Fuze, Proximity, MS04 Series
1310367	Fuze, Proximity, MS13 Series
795245	Fuze, Proximity, MS14 Series
795368	Fuze, Proximity, MS15 Series
7542932	Fuze, Proximity, MS17 Series
10976900	Fuze, Proximity, MS32 Series
11716451	Fuze, Proximity, M732
344523 (Navy)	Fuze, Rocket, Nose, MK137 Series
393783 (Navy)	Fuze, Rocket, Nose, AN-MK149 Series
423844 (Navy)	Fuze, Rocket, Nose, MK154 Series
423845 (Navy)	Fuze, Rocket, Nose, MK155 Series
10993581	Fuze, Rocket, Nose, M414 Series
3883745	Fuze, Rocket, Point Detonating, M423 and M4237 Series
73-3-166	Fuze, Time M84

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
73-3-154	Fuze, Time Superquick, M54
73-3-155	Fuze, Time Superquick, M55
563141	Fuze, MT, MK25 Mod 5 (1390-N237)
258190	Fuze, MT, MK51-4 (1390-N247)
2428426	Fuze, MT, MK342 Mod 0 (1390-N250)
10520791	Fuze, Mechanical Time, M562
10520688	Fuze, Mechanical Time, M563
8594044	Fuze, Mechanical Time, Superquick, M520 Series
9236500	Fuze, Mechanical Time, Superquick, M577
9352381	Fuze, Mechanical Time, Superquick, M577A1
9236701	Fuze, Mechanical Time, Superquick, M582
9352382	Fuze, Mechanical Time, Superquick, M582A1
053001-1	Generator, Gas Pressure, Prop, Actuated
82-0-143	Grenade, Hand, Fragmentation, MK2 Series
75-14-546 PACKED FIBER BODY, NOT CRITICAL	Grenade, Hand, Offensive, MK3 Series
82-0-1 INERT	Grenade, Hand, Practice, M21B2-0-190
82-0-190	Grenade, Hand, Fragmentation, M26 Series
82-0-191 INERT, MAYBE SMALL SEPARATE	Grenade, Hand, Practice, M30
13-7-4 BLACK POWDER CHARGE	Grenade, Hand and Rifle: Smoke, WP, M34
82-0-109 NOT CRITICAL	Grenade, Rifle, Smoke, WP, M19 Series
82-0-117 NOT CRITICAL	Grenade, Rifle, Smoke, M22 Series
82-0-139 NOT CRITICAL	Grenade, Rifle, Smoke, Streamer, M23
82-2-204 NOT CRITICAL	Grenade, Rifle, Illuminating, M27 Series
82-0-195	Grenade, Rifle, HEAT, M31
76-9-62	Igniter, Blasting Fuse, M1 & M2
78-0-127	Igniter, Ram Jet Engine, M113
838168	Igniter, Ram Jet Engine, M114
78-2-590	Igniter, Ram Jet Engine, M132
78-2-592	Igniter, Ram Jet Engine, M133
78-0-155	Igniter, Ram Jet Engine, M134 & M135
8886429	Igniter, Rocket, M20A1
81-1-454	Ignition Cylinder, Portable, Portable Flame Thrower: M1 (MIL-I-11525) NSN 1375-00-219-8583-M680)
75-14-652	Mine, AP, NM, M14
PB5738	Mine, AP, Practice, NM, M17
73-9-25	Primer, Igniter, M10 Series Mine Fuze
74-2-63	Primer, Percussion, M1B1A2
B4760-1	Primer, Percussion, Cap, MCC, Improved No. 2 or 3
74-2-21	Primer, Percussion, Electric MK2A4
36392 (Navy)	Primer, Percussion, Electric MK13
437780 (Navy)	Primer, Percussion, Electric MK 13 Mod 1
437780 (Navy)	Primer, Percussion, Electric MK 13 Mod 2
79132 (Navy)	Primer, Percussion, Electric MK 14 Mod 1
328952 (Navy)	Primer, Percussion, MK22 Mod 0 for 40MM Ammunition
438589 (Navy)	Primer, Percussion, MK22 Mod 1 for 40MM Ammunition

SHAPED CHARGE (ANTI-TANK)

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
539130	Primer, Percussion, M28 and M31 Series
4-2-49	Primer, Percussion, M32
74-2-50	Primer, Percussion, M33
74-2-51	Primer, Percussion, M34
74-2-63	Primer, Percussion, M38 (MK22), M40, M47, M60, M64 and M65 Series
8839472	Primer, Percussion, M49 Series
74-2-86	Primer, Percussion, M57 Series
8797087	Primer, Percussion, M58 Series
74-2-68	Primer, Percussion, M62 Series
P85557	Primer, Percussion, M70 Series
74-2-87	Primer, Percussion, M71 Series
8861197	Primer, Percussion, M82 Series
8863394	Primer, Percussion, XM92 Series
74-8-5	Primer, Electric and Percussion, MK15, Mod 1
439166 (Navy)	Primer, Electric, MK34, Mod 0
563471 (Navy)	Primer, Electric, MK39 Mod 0
7548520	Primer, Percussion, Electric, M67
8839499	Primer, Electric M80 Series
562308 (Navy)	Primer, Electric, MK 35 Mod 1
997568 (Navy)	Primer, Electric, MK 40 for 6"/47
563478 (Navy)	Primer, Percussion, MK 41 Mod 0
786277 (Navy)	Primer, Electric, MK 42 Mod 0
786281 (Navy)	Primer, Electric, MK 42 Mod 2
99 57 (Navy)	Primer, Electric, MK 45 Mod 0
98 26 (Navy)	Primer, Electric, MK 46 Mod 1 for 5"/38
12 82 (Navy)	Primer, Electric MK 15 Mod 3
21, 30 (Navy)	Primer, Percussion, MK 10 Mod 9
225774 (Navy)	Primer, Percussion, Electric, MK 20 Mod 0
441770 (Navy)	Primer, Electric, MK 48 Mod 1
250628 (Navy)	Primer, Electric MK 42 Mod 5
442368 (Navy)	Primer, Electric MK 49 Mod 1
59213 (Navy)	Primer, MK 101, Mod 3
434637 (Navy)	Primer, Electric, MK 153 Mod 0
434756 (Navy)	Primer, Electric, MK 46 Mod 1
4-5-1	Release, Firing Pin, M1 Series
5-1-282	Remover, Aircraft Canopy, M1 Series
0242725	Rocket, Practice, 35MM, Sub-caliber, M73
98760 (Navy)	Signal, Smoke, Marine, AN-MK1, Mod 1
3-0-82	Signal, Illum, Marine, Two-Star-Red, AN M75
3-0-37	Signal, Illum, Grd, Parachute, M17, M19 M21 and M51 Series
3-0-38	Signal, Illum, Grd Cluster, M18, M20, M22 and M52 Series
-0-33	Signal, Illum, AC, Double Star, AN-M37, M38, M39, M40, M41 and M42 Series
-0-34	Signal, Illum, AC, Tracers AN-M53, M54 M55, M56, M57 and M58 Series
97920	Signal, Illum, Grd, Green Star Cluster, M125 Series

APPENDIX A Cont'd

DRAWING NUMBER or MIL-SPEC	ITEM
8797968	Signal, Illum, Parachute, M126 and M127 Series
8797996	Signal, Ground, Smk, M128 and M129 Series
8838071	Signal, Illum, Grd, Parachute, M131 Series
78-0-96	Simulator, Proj Air Burst, M74A1
78-0-115	Simulator, Gun Flash, M110
7549246	Simulator, Proj Ground Burst, M115 Series
8855109	Simulator, Hand Grenade, M116 Series
78-0-120	Simulator, Booby Trap, Flash, M117
78-0-122	Simulator, Booby Trap, Illum, M118
78-0-124	Simulator, Booby Trap, Whistling, M119
9322059	Simulator, Flash, Artillery, M21
11745290	Simulator, Launching, Antitank Guided Missile and Rocket, M22
71-13-3	Simulator, Projectile Airburst: Charge Smoke Puff White *
82-5-146	Squib, Electric, M1 Series
75-17-11	Tracer, M5 Series
8849014	Tracer, XM10 Series
9220866	Fuze, PD, XM716
9220867	Fuze, PD, XM717
9220850	Fuze, PD, XM719
1310347	Fuze, Proximity, M516 Series
727728(S)	Fuze, Proximity, FMU-110/B
727272(S)	Fuze, Proximity, FMU-113

SENECA OB GROUNDS
REMEDIAL DESIGN
PROGRESSION OF OE REMEDIATION

1. Clear surface and subsurface (to a minimum depth of two feet) of the area to be used for staging/execution of the sifting operation. Staging/sifting operation should not be located at an area of the site that is to be remediated for lead contamination.

2. Soils to be remediated for HTRW (i.e soils with lead concentrations greater than 500 mg/kg lead) will be sifted for OE as follows:

A. Soils to be solidified (soils that fail TCLP) will be excavated, sifted and stockpiled so that they are isolated from all other soils. The resulting stockpile will be underlain and covered by an appropriate membrane. The approximate total volume of this soil is 3800 cubic yards.

B. Current pad berm and low-lying hill soils that are simply to be landfilled (ie. >500 ppm of lead but < the TCLP limits) will be excavated, sifted for OE and stockpiled so that they are isolated, underlain and covered. The approximate total volume of this soil is 4200 cubic yards.

C. Soils that are not within the pad berms or the low-lying hill (surface and to a depth of 2 feet (4 feet in isolated occurrences)), and that are simply to be landfilled (ie. >500 ppm of lead but < the TCLP limits) will be excavated, sifted for OE and stockpiled so that they are isolated, underlain and covered. The approximate total volume of this soil is 9400 cubic yards.

3. Soils that do not require remediation for HTRW contamination will be sifted for OE. Following this part of the operation, the sifting should be complete.

A. The pad berms and portions of the low-lying hill that remain will be sifted for OE and stockpiled separately from the stockpiles created above. This soil will be covered with an appropriate membrane. Following overall remediation (OE and HTRW), this soil may be used for fill. Assume that this amount of soil is approximately 16,000 cubic yards.

4. The thirty acre site will be surface swept for OE according to the SOW. {This surface sweep may be conducted following removal and sifting of the pad berms and low-lying hill if that is preferred}.

5. The thirty acre site (that which remains following the sifting of subsurface soils under 2C, above) will be swept (subsurface to a depth of two feet) for OE according to the SOW.

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WAGE DETERMINATION NO: 94-2381 REV (7) AREA: NY,ROCHESTER

WAGE DETERMINATION NO: 94-2381 REV (7) AREA: NY,ROCHESTER

******FOR USE BY FEDERAL AGENCIES PARTICIPATING IN MOU WITH DOL******

REGISTER OF WAGE DETERMINATIONS UNDER THE SERVICE CONTRACT ACT
By direction of the Secretary of Labor

U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON, D.C. 20210

Wage Determination No.: 94-2381
Revision No.: 7
Date of Last Revision: 07/30/1997

William W. Gross Division of
Director Wage Determinations

State(s): New York

Area: NEW YORK COUNTIES OF GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE, YATES.

** Fringe Benefits Required For All Occupations Included In This Wage Determination Follow The Occupational Listing **

OCCUPATION CODE AND TITLE	MINIMUM HOURLY WAGE
ADMINISTRATIVE SUPPORT AND CLERICAL:	
01011 Accounting Clerk I	$ 8.80
01012 Accounting Clerk II	$ 9.62
01013 Accounting Clerk III	$ 11.68
01014 Accounting Clerk IV	$ 14.61
01030 Court Reporter	$ 13.06
01050 Dispatcher, Motor Vehicle	$ 13.06
01060 Document Preparation Clerk	$ 12.71
01070 Messenger (Courier)	$ 10.10
01090 Duplicating Machine Operator	$ 12.71
01110 Film/Tape Librarian	$ 10.86
01115 General Clerk I	$ 10.20
01116 General Clerk II	$ 11.49
01117 General Clerk III	$ 11.75
01118 General Clerk IV	$ 13.28
01120 Housing Referral Assistant	$ 14.56
01131 Key Entry Operator I	$ 8.68
01132 Key Entry Operator II	$ 9.80
01191 Order Clerk I	$ 7.90
01192 Order Clerk II	$ 12.71
01261 Personnel Assistant (Employment) I	$ 9.29
01262 Personnel Assistant (Employment) II	$ 10.86
01263 Personnel Assistant (Employment) III	$ 13.06
01264 Personnel Assistant (Employment) IV	$ 14.56
01270 Production Control Clerk	$ 14.56
01290 Rental Clerk	$ 10.86
01300 Scheduler, Maintenance	$ 10.86
01311 Secretary I	$ 10.86
01312 Secretary II	$ 13.06
01313 Secretary III	$ 14.56

01314	Secretary IV	$ 16.11
01315	Secretary V	$ 18.57
01320	Service Order Dispatcher	$ 10.86
01341	Stenographer I	$ 10.72
01342	Stenographer II	$ 12.86
01400	Supply Technician	$ 16.11
01420	Survey Worker(Interviewer)	$ 13.06
01460	Switchboard Operator-Receptionist	$ 8.64
01510	Test Examiner	$ 13.06
01520	Test Proctor	$ 13.06
01531	Travel Clerk I	$ 7.19
01532	Travel Clerk II	$ 7.60
01533	Travel Clerk III	$ 7.93
01611	Word Processor I	$ 10.09
01612	Word Processor II	$ 11.34
01613	Word Processor III	$ 12.68

AUTOMATIC DATA PROCESSING:

03010	Computer Data Librarian	$ 10.55
03041	Computer Operator I	$ 10.55
03042	Computer Operator II	$ 11.70
03043	Computer Operator III	$ 14.51
03044	Computer Operator IV	$ 15.53
03045	Computer Operator V	$ 17.19
03071	Computer Programmer I 1/	$ 12.53
03072	Computer Programmer II 1/	$ 15.53
03073	Computer Programmer III 1/	$ 17.65
03074	Computer Programmer IV 1/	$ 20.30
03101	Computer Systems Analyst I 1/	$ 19.48
03102	Computer Systems Analyst II 1/	$ 21.10
03103	Computer Systems Analyst III 1/	$ 24.83
03160	Peripheral Equipment Operator	$ 10.55

AUTOMOTIVE SERVICE:

05005	Automobile Body Repairer, Fiberglass	$ 18.08
05010	Automotive Glass Installer	$ 16.52
05040	Automotive Worker	$ 16.52
05070	Electrician, Automotive	$ 17.28
05100	Mobile Equipment Servicer	$ 14.97
05130	Motor Equipment Metal Mechanic	$ 18.08
05160	Motor Equipment Metal Worker	$ 16.52
05190	Motor Vehicle Mechanic	$ 18.08
05220	Motor Vehicle Mechanic Helper	$ 14.14
05250	Motor Vehicle Upholstery Worker	$ 15.73
05280	Motor Vehicle Wrecker	$ 16.52
05310	Painter, Automotive	$ 17.28
05340	Radiator Repair Specialist	$ 16.52
05370	Tire Repairer	$ 14.97
05400	Transmission Repair Specialist	$ 18.08

FOOD PREPARATION AND SERVICE:

07010	Baker	$ 12.80
07041	Cook I	$ 11.00
07042	Cook II	$ 12.80
07070	Dishwasher	$ 9.27
07100	Food Service Worker (Cafeteria Worker)	$ 9.27

07130	Meat Cutter	$ 12.80
07250	Waiter/Waitress	$ 9.84

FURNITURE MAINTENANCE AND REPAIR:

09010	Electrostatic Spray Painter	$ 17.28
09040	Furniture Handler	$ 12.50
09070	Furniture Refinisher	$ 17.28
09100	Furniture Refinisher Helper	$ 14.14
09110	Furniture Repairer, Minor	$ 15.73
09130	Upholsterer	$ 17.28

GENERAL SERVICES AND SUPPORT:

11030	Cleaner, Vehicles	$ 9.27
11060	Elevator Operator	$ 9.27
11090	Gardener	$ 11.63
11121	Housekeeping Aide I	$ 8.69
11122	Housekeeping Aide II	$ 9.27
11150	Janitor	$ 9.27
11210	Laborer, Grounds Maintenance	$ 9.84
11240	Maid or Houseman	$ 8.69
11270	Pest Controller	$ 12.20
11300	Refuse Collector	$ 9.27
11330	Tractor Operator	$ 11.23
11360	Window Cleaner	$ 9.84

HEALTH:

12020	Dental Assistant	$ 9.91
12040	Emergency Medical Technician/ Paramedic Ambulance Driver	$ 10.70
12071	Licensed Practical Nurse I	$ 7.89
12072	Licensed Practical Nurse II	$ 8.86
12073	Licensed Practical Nurse III	$ 9.91
12100	Medical Assistant	$ 8.34
12130	Medical Laboratory Technician	$ 8.34
12160	Medical Record Clerk	$ 8.34
12190	Medical Record Technician	$ 11.56
12221	Nursing Assistant I	$ 6.43
12222	Nursing Assistant II	$ 7.23
12223	Nursing Assistant III	$ 7.89
12224	Nursing Assistant IV	$ 8.86
12250	Pharmacy Technician	$ 10.40
12280	Phlebotomist	$ 8.34
12311	Registered Nurse I	$ 12.97
12312	Registered Nurse II	$ 15.88
12313	Registered Nurse II, Specialist	$ 15.88
12314	Registered Nurse III	$ 19.20
12315	Registered Nurse III, Anesthetist	$ 19.20
12316	Registered Nurse IV	$ 23.01

INFORMATION AND ARTS:

13002	Audiovisual Librarian	$ 16.11
13011	Exhibits Specialist I	$ 15.23
13012	Exhibits Specialist II	$ 18.74
13013	Exhibits Specialist III	$ 20.47
13041	Illustrator I	$ 15.23
13042	Illustrator II	$ 18.74
13043	Illustrator III	$ 20.47

13047	Librarian	$ 18.57
13050	Library Technician	$ 14.56
13071	Photographer I	$ 12.60
13072	Photographer II	$ 15.23
13073	Photographer III	$ 18.74
13074	Photographer IV	$ 20.47
13075	Photographer V	$ 21.94

LAUNDRY, DRY CLEANING, PRESSING:

15010	Assembler	$ 5.30
15030	Counter Attendant	$ 5.30
15040	Dry Cleaner	$ 6.63
15070	Finisher, Flatwork, Machine	$ 5.30
15090	Presser, Hand	$ 5.30
15100	Presser, Machine, Dry Cleaning	$ 5.30
15130	Presser, Machine, Shirts	$ 5.30
15160	Presser, Machine, Wearing Apparel, Laundry	$ 5.30
15190	Sewing Machine Operator	$ 7.07
15220	Tailor	$ 7.51
15250	Washer, Machine	$ 5.75

MACHINE TOOL OPERATION AND REPAIR:

19010	Machine-tool Operator (Toolroom)	$ 17.28
19040	Tool and Die Maker	$ 21.43

MATERIALS HANDLING AND PACKING:

21010	Fuel Distribution System Operator	$ 14.97
21020	Material Coordinator	$ 16.62
21030	Material Expediter	$ 16.62
21040	Material Handling Laborer	$ 10.92
21050	Order Filler	$ 11.68
21071	Forklift Operator	$ 14.69
21080	Production Line Worker (Food Processing)	$ 15.00
21100	Shipping/Receiving Clerk	$ 9.33
21130	Shipping Packer	$ 9.33
21140	Store Worker I	$ 8.89
21150	Stock Clerk (Shelf Stocker; Store Worker II)	$ 9.33
21210	Tools and Parts Attendant	$ 15.00
21400	Warehouse Specialist	$ 15.00

MECHANICS AND MAINTENANCE AND REPAIR:

23010	Aircraft Mechanic	$ 18.08
23040	Aircraft Mechanic Helper	$ 14.14
23050	Aircraft Quality Control Inspector	$ 21.33
23060	Aircraft Servicer	$ 15.73
23070	Aircraft Worker	$ 16.52
23100	Appliance Mechanic	$ 17.28
23120	Bicycle Repairer	$ 14.97
23125	Cable Splicer	$ 18.08
23130	Carpenter, Maintenance	$ 17.28
23140	Carpet Layer	$ 16.52
23160	Electrician, Maintenance	$ 19.52
23181	Electronics Technician, Maintenance I	$ 18.77

23182	Electronics Technician, Maintenance II	$ 19.61
23183	Electronics Technician, Maintenance III	$ 20.51
23260	Fabric Worker	$ 15.73
23290	Fire Alarm System Mechanic	$ 18.08
23310	Fire Extinguisher Repairer	$ 14.97
23340	Fuel Distribution System Mechanic	$ 18.08
23370	General Maintenance Worker	$ 16.52
23400	Heating, Refrigeration and Air Conditioning Mechanic	$ 18.08
23430	Heavy Equipment Mechanic	$ 18.08
23440	Heavy Equipment Operator	$ 17.45
23460	Instrument Mechanic	$ 18.08
23470	Laborer	$ 10.14
23500	Locksmith	$ 17.28
23530	Machinery Maintenance Mechanic	$ 18.08
23550	Machinist, Maintenance	$ 18.30
23580	Maintenance Trades Helper	$ 14.14
23640	Millwright	$ 18.08
23700	Office Appliance Repairer	$ 17.28
23740	Painter, Aircraft	$ 17.28
23760	Painter, Maintenance	$ 17.28
23790	Pipefitter, Maintenance	$ 21.05
23800	Plumber, Maintenance	$ 17.28
23820	Pneudraulic Systems Mechanic	$ 18.08
23850	Rigger	$ 18.08
23870	Scale Mechanic	$ 16.52
23890	Sheet-metal Worker, Maintenance	$ 18.08
23910	Small Engine Mechanic	$ 16.52
23930	Telecommunications Mechanic I	$ 18.08
23931	Telecomunications Mechanic II	$ 18.84
23950	Telephone Lineman	$ 18.08
23960	Welder, Combination, Maintenance	$ 18.08
23965	Well Driller	$ 18.08
23970	Woodcraft Worker	$ 18.08
23980	Woodworker	$ 14.97

PERSONAL NEEDS:

24570	Child Care Attendant	$ 9.69
24580	Child Care Center Clerk	$ 12.09
24600	Chore Aide	$ 8.69
24630	Homemaker	$ 13.44

PLANT AND SYSTEM OPERATION:

25010	Boiler Tender	$ 18.08
25040	Sewage Plant Operator	$ 17.28
25070	Stationary Engineer	$ 18.08
25190	Ventilation Equipment Tender	$ 14.14
25210	Water Treatment Plant Operator	$ 17.28

PROTECTIVE SERVICE:

27004	Alarm Monitor	$ 12.85
27010	Court Security Officer	$ 16.24
27040	Detention Officer	$ 16.24
27070	Firefighter	$ 15.38
27101	Guard I	$ 6.77

27102	Guard II	$ 12.85
27130	Police Officer	$ 18.00

STEVEDORING/LONGSHOREMEN SERVICE OCCUPATIONS:

28010	Blocker and Bracer	$ 17.55
28020	Hatch Tender	$ 17.55
28030	Line Handler	$ 17.55
28040	Stevedore I	$ 16.65
28050	Stevedore II	$ 18.30

TECHNICAL:

29010	Air Traffic Control 2/ Specialist, Center	$ 22.24
29011	Air Traffic Control 2/ Specialist, Station	$ 15.34
29012	Air Traffic Control 2/ Specialist, Terminal	$ 16.89
29023	Archeological Technician I	$ 13.49
29024	Archeological Technician II	$ 15.18
29025	Archeological Technician III	$ 18.74
29030	Cartographic Technician	$ 18.74
29035	Computer Based Training Specialist/Instructor	$ 19.48
29040	Civil Engineering Technician	$ 18.74
29061	Drafter I	$ 11.21
29062	Drafter II	$ 12.60
29063	Drafter III	$ 15.23
29064	Drafter IV	$ 18.74
29081	Engineering Technician I	$ 11.21
29082	Engineering Technician II	$ 12.60
29083	Engineering Technician III	$ 15.23
29084	Engineering Technician IV	$ 18.13
29085	Engineering Technician V	$ 20.12
29086	Engineering Technician VI	$ 21.57
29090	Environmental Technician	$ 15.53
29100	Flight Simulator/Instructor (Pilot)	$ 21.10
29150	Graphic Artist	$ 19.48
29160	Instructor	$ 19.48
29210	Laboratory Technician	$ 14.51
29240	Mathematical Technician	$ 18.13
29361	Paralegal/Legal Assistant I	$ 13.06
29362	Paralegal/Legal Assistant II	$ 16.11
29363	Paralegal/Legal Assistant III	$ 19.70
29364	Paralegal/Legal Assistant IV	$ 23.84
29390	Photooptics Technician	$ 18.13
29480	Technical Writer	$ 20.30
29491	Unexploded Ordnance Technician I	$ 15.02
29492	Unexploded Ordnance Technician II	$ 18.17
29493	Unexploded Ordnance Technician III	$ 21.78
29494	Unexploded Safety Escort	$ 15.02
29495	Unexploded Sweep Personnel	$ 15.02
29620	Weather Observer, Senior 3/	$ 16.12
29621	Weather Observer, Combined 3/ Upper Air and Surface Programs	$ 14.51
29622	Weather Observer, Upper Air 3/	$ 14.51

TRANSPORTATION/MOBILE EQUIPMENT

OPERATION:

31030	Bus Driver	$ 14.98
31260	Parking and Lot Attendant	$ 8.34
31290	Shuttle Bus Driver	$ 10.70
31300	Taxi Driver	$ 10.10
31361	Truckdriver, Light Truck	$ 10.70
31362	Truckdriver, Medium Truck	$ 14.98
31363	Truckdriver, Heavy Truck	$ 15.33
36364	Truckdriver, Tractor-Trailer	$ 15.71

MISCELLANEOUS:

99020	Animal Caretaker	$ 10.43
99030	Cashier	$ 7.91
99041	Carnival Equipment Operator	$ 11.23
99042	Carnival Equipment Repairer	$ 11.63
99043	Carnival Worker	$ 9.27
99050	Desk Clerk	$ 9.69
99095	Embalmer	$ 14.14
99300	Lifeguard	$ 8.64
99310	Mortician	$ 14.14
99350	Park Attendant (Aids)	$ 10.84
99400	Photofinishing Worker (Photo Lab / Dark Room Technician)	$ 8.64
99500	Recreation Specialist	$ 13.44
99510	Recycling Worker	$ 11.00
99610	Sales Clerk	$ 8.64
99620	School Crossing Guard (Cross-walk Attendant)	$ 9.27
99630	Sports Official	$ 8.64
99658	Survey Party Chief	$ 18.85
99659	Surveying Technician	$ 14.09
99660	Surveying Aide	$ 10.27
99690	Swimming Pool Operator	$ 12.80
99720	Vending Machine Attendant	$ 9.88
99730	Vending Machine Repairer	$ 12.65
99740	Vending Machine Repairer Helper	$ 9.88

** Fringe Benefits Required For All Occupations Included In This Wage Determination **

HEALTH & WELFARE: $1.16 per hour or $46.40 per week or $201.07 per month.

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 5 years; 4 weeks after 10 years; 5 weeks after 20 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 4.173)

HOLIDAYS: Minimum of ten paid holidays per year: New Year's Day, Martin Luther King Jr.'s Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4.174)

1/

Does not apply to employees employed in a bona fide executive, administrative, or professional capacity as defined and delineated in 29 CFR 541. (See 29 CFR 4.156)

2/

APPLICABLE TO AIR TRAFFIC CONTROLLERS ONLY - NIGHT DIFFERENTIAL: An employee is entitled to pay for all work performed between the hours of 6:00 P.M. and 6:00 A.M. at the rate of basic pay plus a night pay differential amounting to 10 percent of the rate of basic pay.

3/

APPLICABLE TO WEATHER OBSERVERS ONLY - NIGHT PAY & SUNDAY PAY: If you work at night as a part of a regular tour of duty, you will earn a NIGHT DIFFERENTIAL and receive an additional 10% of basic pay for any hours worked between 6pm and 6am. If you are a full-time employee (40 hours a week) and Sunday is part of your regularly scheduled workweek, you are paid at your rate of basic pay plus a Sunday premium of 25% of your basic rate for each hour of Sunday work which is not overtime (i.e. occasional work on Sunday outside the normal tour of duty is considered overtime work).

** UNIFORM ALLOWANCE **

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of $4.25 per week (or $.85 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

** NOTES APPLYING TO THIS WAGE DETERMINATION **

Source of Occupational Titles and Descriptions:

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations," Fourth Edition, January 1993, as amended by the Second Supplement, dated August 1995, unless otherwise indicated. This publication may be obtained from the Superintendent of Documents, at 202-783-3238, or by writing to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Copies of specific job descriptions may also be obtained from the appropriate contracting

officer.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE (Standard Form 1444 (SF 1444))

Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. (See Section 4.6 (C)(vi)) When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

1) When preparing the bid, the contractor identifies the need for a conformed occupation(s) and computes a proposed rate(s).

2) After contract award, the contractor prepares a written report listing in order proposed classification title(s), a Federal grade equivalency (FGE) for each proposed classification(s), job description(s), and rationale for proposed wage rate(s), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.

3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).

4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.

5) The contracting officer transmits the Wage and Hour decision to the contractor.

6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed

by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

APPENDIX C

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

PROJECT MAPS

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

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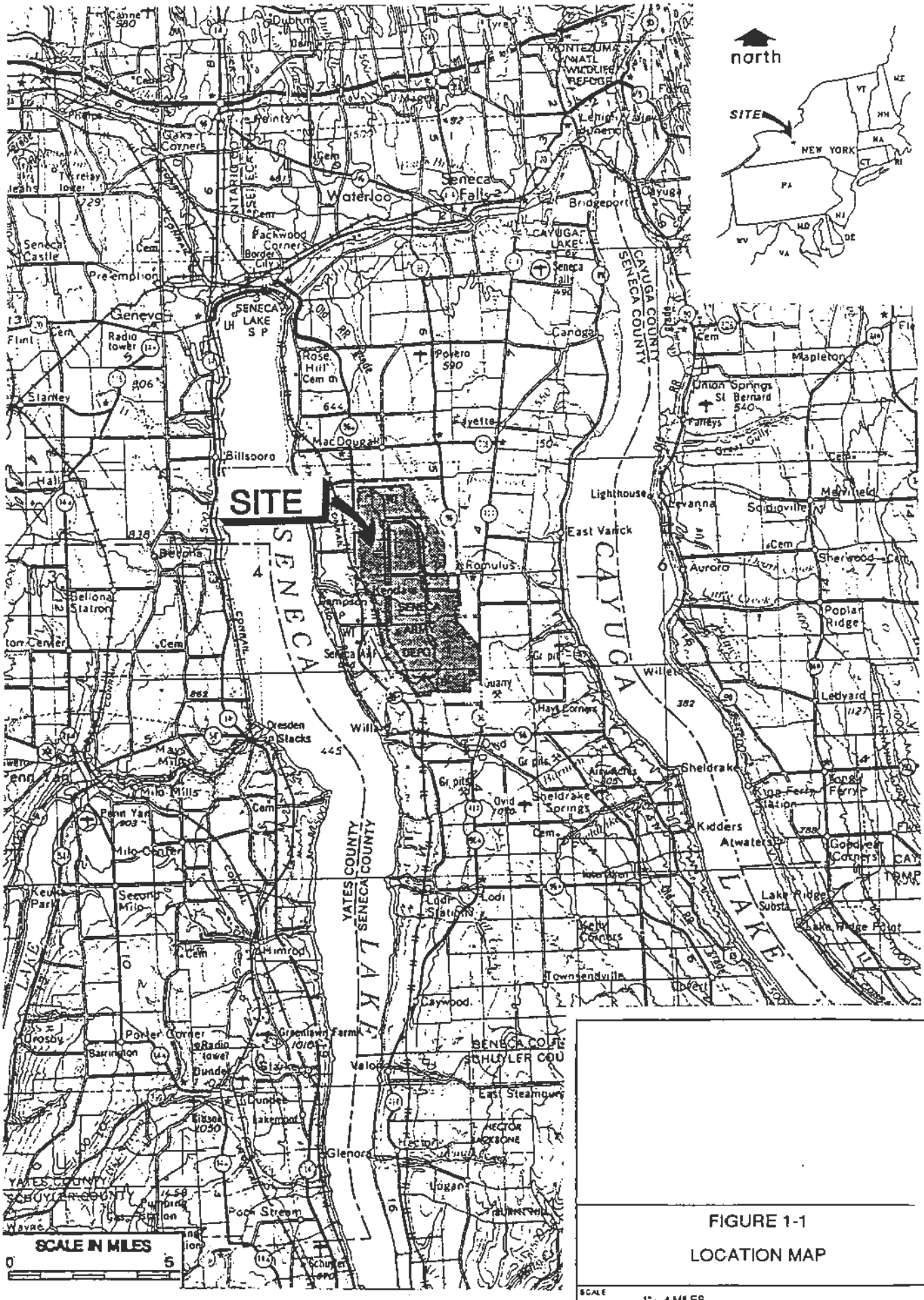

FIGURE 1-1

LOCATION MAP

SCALE 1" = 4 MILES

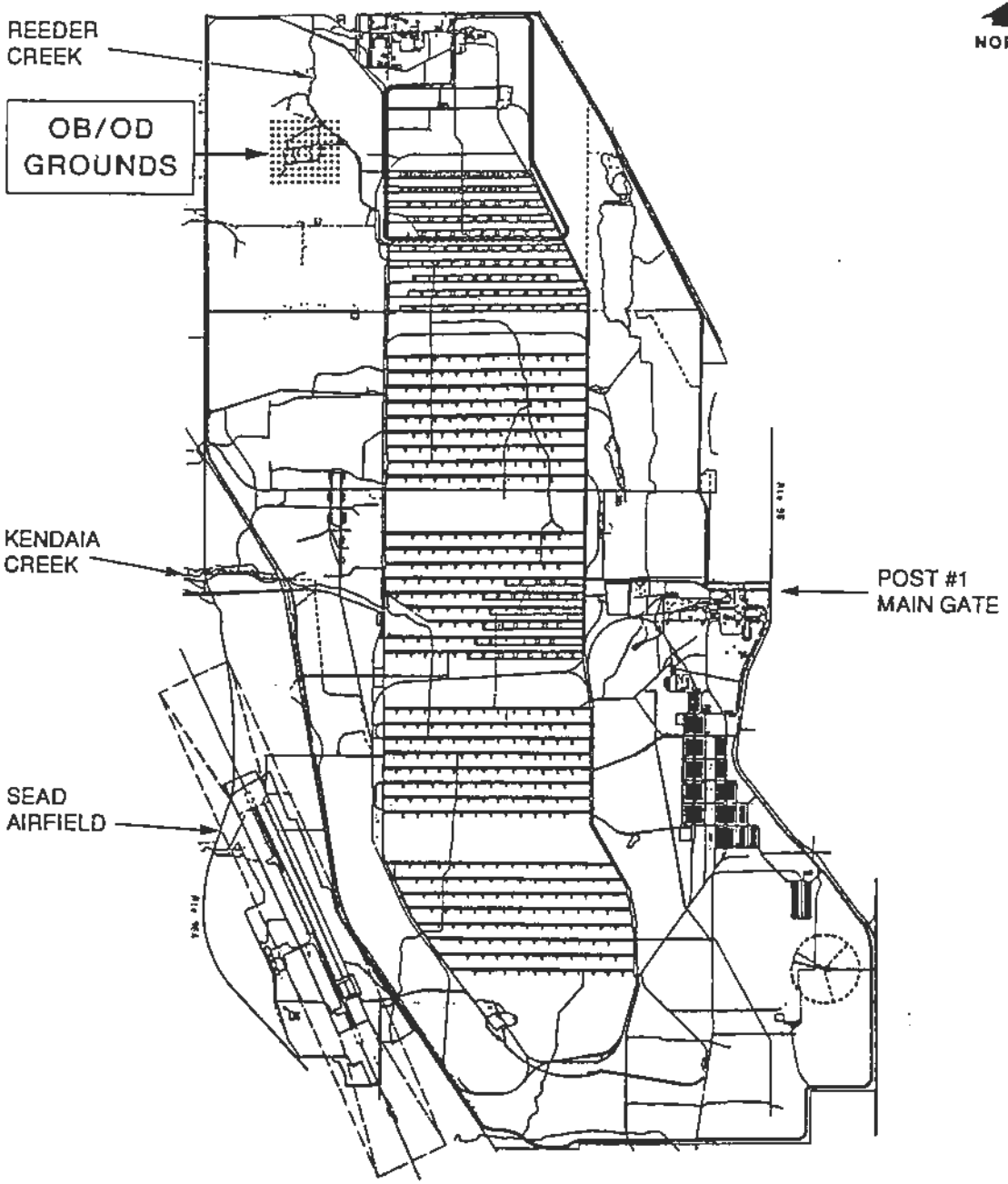

FIGURE 1-2

SENECA army DEPOT MAP

SCALE 1" = 5000' (APPROXIMATE)

SOURCE: Seneca Army Depot

LEGEND:

- (G) — BURNING PAD DESIGNATION
- BE-G-1 — BERM EXCAVATION & DESIGNATION
- PB-G-1 GB-2 — BORING & DESIGNATION
- 630 — GROUND CONTOUR AND ELEVATION
- W-1 — WETLAND & DESIGNATION
- MW-17 — MONITORING WELL & DESIGNATION
- DIRT ROAD
- UTILITY POLE
- TREE
- BRUSH
- SW-210 — SURFACE WATER/SEDIMENT SAMPLE & DESIGNATION

N

Open Detonation Mound

Reeder Creek

Burning Tray W-37

Burn Kettle W-12 W-11

W-1 W-2 W-4 W-5 W-6 W-7 W-8 W-9 W-10 W-11 W-12 W-13 W-14 W-15 W-16 W-17 W-18 W-19 W-20 W-23 W-24 W-26 W-27 W-28 W-30 W-31 W-32 W-33 W-34 W-35 W-38 W-79

630 620 632 634 636 640

FIGURE 1-3
SITE MAP

SCALE
1" = 200 feet

APPENDIX D

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

POINTS OF CONTACT

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

POINTS OF CONTACT

1. EMERGENCY SERVICES---911

Hospital (non-trauma):
Geneva General Hospital ..... (315) 798-4222
Hospital (trauma):
Syracuse University Hospital .....
Police:
Seda Police/Security ..... (607) 869-0448
Local EOD:
725th Ordnance Company (EOD) ..... (315) 772-5408
Fire:
Seda Fire Department ..... (607) 869-1316
Air Ambulance:
Mercy Flight 911
Surface Ambulance:
South Seneca Ambulance 911

2. MISCELLANEOUS

3. KEY PERSONNEL

A. CEHNC Personnel
Alicia Allen, Project Manager ..... (205) 895-1552
Mary Dowling, Contracting Officer ..... (205) 895-1151
_____, Safety Officer ..... (205) 895-
Kevin Healy, Lead Engineer ..... (205) 895-1627

B. SEDA and New York Corps Personnel
Steve Absolom, BRAC Environmental Coordinator ..... (607) 869-1309
Randall Battaglio, NY Corps of Engineers Project Manager ..... (607) 869-1523

C. EODT Personnel

Jeffrey Bleke, Program Manager ..... (352) 332-8398
John Scott, Project Manager ..... (352) 332-8398
Andrew Bryson, CIH, Program Safety/Training ..... (423) 690-6061
Michael Short, QA/QC Manager ..... (423) 690-6061
Salvatore Molle, Senior UXO Supervisor/Site Manager ..... (423) 690-6061

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APPENDIX E

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

SAMPLE FORMS

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

TABLE OF SAMPLE FORMS

(For Safety Staff only)	REPORT NO.	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT (For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)	REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

a. NAME (Last,First,MI)	b. AGE	c. SEX	d. SOCIAL SECURITY NUMBER	e. GRADE
		☐ MALE ☐ FEMALE	___ ___ ___ / ___ ___ / ___ ___ ___ ___	

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER (Specify)

3. GENERAL INFORMATION

a. DATE OF ACCIDENT (month/day/year)	b. TIME OF ACCIDENT (Military time))	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME
/ /			(1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER (Specify)	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER (Specify)	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER (Specify)

4. CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see instructions)

a. CONSTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)
	/		/

INJURY / ILLNESS INFORMATION (Include name on line and corresponding code number in box for items a, f & g - see instructions)

SEVERITY OF ILLNESS / INJURY	(CODE)	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY
	/			

e. BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE)
PRIMARY	/	TYPE	/
SECONDARY	/	SOURCE	/
f. NATURE OF ILLNESS / INJURY	/		

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?
	/	☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLUSION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER (Specify)	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER (Specify)	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL / FLOATING PLANT ACCIDENT (Fill in line and corresponding code number in box from list - see instructions)

TYPE OF VESSEL/FLOATING PLANT	(CODE)	b. TYPE OF COLLISON/MISHAP	(CODE)
	/		/

ACCIDENT DESCRIPTION (Use additional paper, if necessary)

11. 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?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc.,contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust,fumes,mists,vapors or physical agents, such as, noise,radiation,etc.,contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture,carrying,stooping,etc.,contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion,was drugs or alcohol a factor to the accident?	☐	☐

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?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	/ / *(Month) (Day) (Year)*

13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES *(See 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

16. MANAGEMENT REVIEW *(1st).*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

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

COMMAND APPROVAL

MENTS

COMMANDER SIGNATURE	DATE

Bureau of Labor Statistics
Log and Summary of Occupational
Injuries and Illnesses

U.S. Department of Labor

NOTE: This form is required by Public Law 91-596 and must be kept in the establishment for *5 years*. Failure to maintain and post can result in the issuance of citations and assessment of penalties. *(See posting requirements on the other side of form.)*

RECORDABLE CASES: You are required to record information about every occupational death; every nonfatal occupational illness; and those nonfatal occupational injuries which involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment (other than first aid). *(See definitions on the other side of form.)*

For Calendar Year 19 ______ Page ___ of ___

Company Name ______

Establishment Name ______

Establishment Address ______

Form Approved
O.M.B. No. 1220-0029
See OMB Disclosure Statement on reverse.

Case or File Number	Date of Injury or Onset of Illness	Employee's Name	Occupation	Department	Description of Injury or Illness	Extent of and Outcome of INJURY						Type, Extent of, and Outcome of ILLNESS												
						Fatalities	Nonfatal Injuries					Type of Illness							Fatalities	Nonfatal Illnesses				
						Injury Related	Injuries With Lost Workdays				Injuries Without Lost Workdays	CHECK Only One Column for Each Illness *(See other side of form for terminations or permanent transfers.)*							Illness Related	Illnesses With Lost Workdays				Illnesses Without Lost Workdays
Enter a nonduplicating number which will facilitate comparisons with supplementary records.	Enter Mo./day.	Enter first name or initial, middle initial, last name.	Enter regular job title, not activity employee was performing when injured or at onset of illness. In the absence of a formal title, enter a brief description of the employee's duties.	Enter department in which the employee is regularly employed or a description of normal workplace to which employee is assigned, even though temporarily working in another department at the time of injury or illness.	Enter a brief description of the injury or illness and indicate the part or parts of body affected. Typical entries for this column might be: Amputation of 1st joint right forefinger; Strain of lower back; Contact dermatitis on both hands; Electrocution—body.	Enter DATE of death. Mo./day/yr.	Enter a CHECK if injury involves days away from work, or days of restricted work activity, or both.	Enter a CHECK if injury involves days away from work.	Enter number of DAYS away *from work.*	Enter number of DAYS of *restricted work activity.*	Enter a CHECK if no entry was made in columns 1 or 2 but the injury is recordable as defined above.	Occupational skin diseases or disorders	Dust diseases of the lungs	Respiratory conditions due to toxic agents	Poisoning (systemic effects of toxic materials)	Disorders due to physical agents	Disorders associated with repeated trauma	All other occupational illnesses	Enter DATE of death. Mo./day/yr.	Enter a CHECK if illness involves days away from work, or days of restricted work activity, or both.	Enter a CHECK if illness involves days away from work.	Enter number of DAYS away *from work.*	Enter number of DAYS of *restricted work activity.*	Enter a CHECK if no entry was made in columns 8 or 9.
(A)	(B)	(C)	(D)	(E)	(F)	(1)	(2)	(3)	(4)	(5)	(6)	(7) (a)	(7) (b)	(7) (c)	(7) (d)	(7) (e)	(7) (f)	(7) (g)	(8)	(9)	(10)	(11)	(12)	(13)
					PREVIOUS PAGE TOTALS →																			
					TOTALS (Instructions on other side of form.) →																			

Certification of Annual Summary Totals By ______ Title ______ Date ______

FOLD

OSHA No. 200 ★U.S.GPO:1990-262-256/15419

OSHA No. 200

POST ONLY THIS PORTION OF THE LAST PAGE NO LATER THAN FEBRUARY 1.

EODT ACCIDENT/ILLNESS/NEAR MISS REPORT

SECTION 1 - GENERAL INFORMATION

Name: SSN:

Job Title: D.O.B.: Sex: Age:

Site Name: SSO:

Date of Report: Date of Incident: Time of Incident:

Task/Operation Being Conducted:

PPE Worn:

Site Conditions at Time of Incident

Temperature: _____ Humidity: _____
Wind Speed: _____ Direction: _____ Cloud Cover: _____
Precipitation: _____ Other: _____

Type of Incident: ☐ Personal Injury ☐ Personal Illness ☐ Chemical Exposure
☐ Motor Vehicle ☐ Property Damage ☐ Near Miss

If chemical exposure, what material(s) was(were) involved: _____
What was the nature of exposure (contact, inhalation, etc.): _____

Other Individual(s) Involved:

SECTION 2 - PERSONAL INJURY/ILLNESS INFORMATION

Nature/Type of Injury/Illness (laceration, strain, etc.): _____

Cause of Injury/Illness: _____

Body Part(s) Affected: Primary _____ Secondary _____

Injury/Illness Required: ☐ On Site First Aid Treatment ☐ Emergency Room Treatment ☐ Hospitalization

Injury/Illness Resulted In: ☐ Loss of Work Time ☐ Limitation of Duties ☐ Fatality
☐ Other: (Explain) _____

Status at Time of Report: ☐ Returned to Work: (Date _____) ☐ Hospitalized: (Anticipated Stay _____)
☐ Convalescing: (Anticipated Length of Convalescence _____)
☐ Other: _____

On Site First Aid Treatment Given: _____

Off Site Medical Treatment (attach documentation, including Physician statement):

EODT SSHP REVIEW FORM

All site personnel shall sign this form after having read the SSHP, and will do so prior to being allowed to perform operations on site involving known or potential exposures to safety of health hazards.

Employee Statement

My signature below indicates that I have read the SSHP and have received answers to any questions which I had related to the SSHP. My signature further indicates my willingness to comply with the provisions and requirements of the SSHP.

Project Name/Location:			
Date:	Organization	Printed Name	Signature

EODT ACCIDENT/ILLNESS/NEAR MISS REPORT (cont.)

SECTION 3 - MOTOR VEHICLE ACCIDENT

Type of Vehicle/Equipment	Type of Collision	Seat Belt Use
☐ Automobile ☐ Van/Truck ☐ Bush Hog ☐ Other: _____	☐ Side Swipe ☐ Rear End ☐ Backing ☐ Head on ☐ Broadside ☐ Roll	Front Seat ☐ Yes ☐ No Back Seat ☐ Yes ☐ No

Property/Material/Items Involved

Name of Item	Owner	$ Amount of Damage

Accident Description (Use additional paper if needed)

SECTION 4 - POST ACCIDENT/INJURY/ILLNESS REVIEW

Has the EODT Home Office been notified? ☐ Yes ☐ No, If Yes, When? _____ By Whom? _____

Were operations conducted using approved EODT SOP or a SSHP?
☐ Yes Reference: _____
☐ No Explain: _____

SSO's Comments: _____

Employee Comments: _____

Witnesses

Name	Organization	Phone Number

Employee Signature: Date:

SSO Signature: Date:

Actions to be taken to prevent future occurrence: _____

Actions Completed By: Date:

EODT Corp. Review By: Date:

EODT SAFETY TRAINING ATTENDANCE LOG
OE OPERATIONS

Date:	Instructor(s):	Time:	No.:
Contract Number:		Delivery Order Number:	
Location:			

Training Provided: ☐ Initial Site Hazard Training ☐ Weekly Safety Training ☐ Other: _____
☐ Tailgate Safety Briefing ☐ Task/Hazard Specific Training _____

I. TRAINING TOPICS COVERED

Work Plan and /SSHP: _____

UXO/OE Hazards: _____

Chemical Hazards: _____

Physical Hazards: _____

Emergency Procedures: _____

Other: _____

II. TRAINING COURSE ATTENDEES

Name (printed)	Signature	Organization

EODT SAFETY TRAINING ATTENDANCE LOG

OE OPERATIONS

II. TRAINING COURSE ATTENDEES (continued)		
Name (printed)	Signature	Orgainzation

III. VERIFICATION

I certify that the personnel listed on this roster received the safety training described above. Site personnel not attending this training will be briefed before beginning their assigned duties.

_____ Site Safety and Health Officer

_____ Sr. UXO Supervisor / Project Manager

EODT THREE-DAY ON-SITE TRAINING LOG

Location:	
Contract No.:	Task Order No.:
Sr. UXO Supervisor	SSHO:

The following site personnel have received the three-day supervised on-site training as required by 29 CFR 1910.120. This training has included: a description of the site chain-of-command; site hazard information; use/care/maintenance of PPE; personnel and equipment decon procedures; safe work practices; medical/training requirements; and emergency response and evacuation procedures.

THREE-DAY TRAINING ATTENDEES

Name (printed)	Signature	Organization	Date

EODT SAFETY INSPECTION AND AUDIT LOG

FOR OE OPERATIONS

DATE:	TIME:	LOG NO.:
CONTRACT NO.:	DELIVERY ORDER NO.:	
LOCATION:		
WEATHER CONDITIONS:		

I. AREAS INSPECTED: (List by grid number, Team or task) _____

II. INSPECTION RESULTS

Item Description	Pass	Item Description	Pass
1. Personal Protection (PPE) per SSHP	Y / N	9. UXO/OE Detection Equipment	Y / N
2. Work Practices Follow SSHP	Y / N	10. UXO/OE Detection Equipment Calibration	Y / N
3. Site Control/Decon per SSHP	Y / N	11. MSDSs and Container Labeling per SSHP	Y / N
4. First Aid Kit(s)/Eyewash Station(s)	Y / N	12. On- and Off-Site Communications	Y / N
5. Fire Extinguisher(s)	Y / N	13. Site House Keeping	Y / N
6. Flammable Storage Areas	Y / N	14. Explosives / Ordnance Storage Areas	Y / N
7. Safety and Health Monitoring Equipment Use	Y / N	15. Other: (list)	Y / N
8. Monitoring Equipment Calibration	Y / N	16. Other: (list)	Y / N

III. CORRECTIVE ACTIONS RECOMMENDED (If required): _____

IV: REINSPECTION RESULTS (If required): _____

V. SIGNATURES:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

_____ Site Safety and Health Officer

_____ Sr. UXO Supervisor / Project Manager

EODT VEHICLE INSPECTION CHECKLIST

(To be used weekly for all vehicles EXCEPT explosive carriers which must be inspected prior to each explosives transport)

Site Name / Location: _____

SUXOS: _____ Inspector: _____ Vehicle: _____
(MAKE AND LICENSE PLATE #)

Date Inspected: _____ Mileage: _____ Owner: _____
(RENTAL, EODT, GFE, CONTRACT)

USE ✓ FOR PASS, X FOR DISCREPANCY

1. DOCUMENTATION:	Pass	Fail	2. BRAKES:	Pass	Fail
Registration	[ ]	[ ]	Hand/Emergency	[ ]	[ ]
Insurance	[ ]	[ ]	Service	[ ]	[ ]
Emergency Route Map and Phone Numbers	[ ]	[ ]			
3. TIRES:			**4. BELTS:**		
Pressure	[ ]	[ ]	Proper tension	[ ]	[ ]
Condition	[ ]	[ ]	Condition	[ ]	[ ]
5. EQUIPMENT:			**6. LIGHTS:**		
Fire extinguishers*	[ ]	[ ]	Headlights (high & low)	[ ]	[ ]
First Aid/CPR/Burn	[ ]	[ ]	Brake Lights	[ ]	[ ]
Eyewash kits	[ ]	[ ]	Parking	[ ]	[ ]
Emergency Breakdown Kit	[ ]	[ ]	Back-up	[ ]	[ ]
Spare Tire	[ ]	[ ]	Turn Signals	[ ]	[ ]
Tire Changing Equipment	[ ]	[ ]	Emergency Flashers	[ ]	[ ]
Tie downs*	[ ]	[ ]			
Chocks*	[ ]	[ ]			
Placards*	[ ]	[ ]			
7. FLUID LEVELS:			**8. GENERAL:**		
Oil	[ ]	[ ]	Windshield Wipers	[ ]	[ ]
Coolant	[ ]	[ ]	Windshield/Windows	[ ]	[ ]
Brake	[ ]	[ ]	Seat Belts	[ ]	[ ]
Steering	[ ]	[ ]	Steering	[ ]	[ ]
Transmission	[ ]	[ ]	Horn	[ ]	[ ]
Windshield Wiper	[ ]	[ ]	Gas Cap	[ ]	[ ]
Fluid Leaks	[ ]	[ ]	Mirrors	[ ]	[ ]
			Cleanliness	[ ]	[ ]
			Exhaust System*	[ ]	[ ]

(Note: Items marked with * are required for explosive carriers and must be inspected prior to each use)

Description of deficiencies: _____

_____

_____

_____

EODT HAZARD COMMUNICATION TRAINING

SITE INFORMATION

Site Name:	Date:
Location:	Instructor:
Contract Number:	Delivery Order Number:

TRAINING ELEMENTS COVERED

Initial	Topic	Initial	Topic
	Requirements of 29 CFR 1910.1200		Target organs affected
	Elements of EODT HAZCOM Program		Physical hazards (fire, explosion, etc.)
	Local of Program, MSDS's & Inventory		Detection of and protection from exposure
	Hazardous substance operations/processes		Spill/emergency response
	Acute/chronic health hazards		Labeling requirements

HAZARDOUS SUBSTANCES / PRODUCTS AND MSDS's REVIEWED

Initial	Hazardous Substance/Product	Initial	Hazardous Substance/Product

TRAINING COURSE ATTENDANTS

My signature indicates that I have received training in the above listed topics as they relate to the hazardous substances and products with which I work, and I am familiar with the requirements of the EODT Hazard Communication Program.

Name (printed)	Signature	Company/Organization

EODT HAZARD COMMUNICATION TRAINING

Location: | Date:

TRAINING COURSE ATTENDANTS (cont.)

My signature indicates that I have received training in the above listed topics as they relate to the hazardous substances and products with which I work, and I am familiar with the requirements of the EODT Hazard Communication Program.

Name (printed)	Signature	Company/Organization

EODT SITE MONITORING LOG

Location: _____ Operation: _____

Contract No.: _____ Delivery Order No.: _____ Work Shift: _____ Sampler: _____
Start: End:

TYPE OF MONITORING AND RESULTS

Date	Time (24 hr)	Noise (dBA)	Org. ppm	O_2 %	LEL %	CO ppm	HCN ppm	Dust mg/m^3					Remarks

Instrument Information

Type	Make	Model	Serial Number	Cal. Date

General Remarks and Observations

EODT HEAT STRESS MONITORING LOG

Project Location:													Contract Number:	Delivery Order Number:
SSHO:		Anticipated Weather Conditions:												
Date	Name	Organization	Start Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate

Remarks and Observations: _____

_____

_____

_____

EODT SITE SPECIFIC CHEMICAL INVENTORY FORM

Site Name/Location:			Contract No.:	Delivery Order No.:	
Date	Product Name	Supplier's Name and Address	Hazardous Chemicals	Training Given	MSDS Available

EODT SITE VISITORS LOG
FOR OE OPERATIONS

LOCATION:			CONTRACT NO.:		DELIVERY ORDER NO.:		
Date	Name	Company	Reason for Visit	Safety Briefing Given By	Time		Escort Req'd (Y / N)
					In	Out	

EODT SITE COMPLIANCE CHECKLIST

GENERAL SITE INFORMATION

Site Name/Location: _____

Contract Number: _____ Delivery Order Number: _____

SSHO: _____ SUXOS: _____ PM: _____

Audit Performed By: _____ Date: _____

COMPLIANCE ITEMS	In Compliance?		
	Yes	No	N/A
1.0 CORPORATE SAFETY AND HEALTH PROGRAM AND SITE SAFETY AND HEALTH PLAN			
1.1 Written Corporate Safety and Health Program (CSHP) available upon request to site, contractor and regulatory personnel			
1.2 Relevant CSHP Attachments, Programs and SOPs on site and being followed			
1.3 Work Plan (WP) and Site Safety and Health Plan (SSHP) on site, and SSHP Review Form signed by all site personnel			
1.4 Safety/training/visitor/monitoring logs available and up to date			
2.0 SITE CHARACTERIZATION AND HAZARD ASSESSMENT			
2.1 Potential IDLH conditions identified prior to employee entry			
2.2 PPE selected and provided for initial entry if potential exists for exposures above PEL			
2.3 Escape bottle provided if air purifying respirator is used during initial entry/site evaluation			
2.4 Minimum Level B used if unable to characterize site hazards prior to initial site entry/evaluation			
2.5 Monitoring for IDLH conditions and radiation hazards conducted during initial entry/evaluation			
2.6 A certificate of task hazard assessment has been completed which identifies the appropriate PPE and other control methods to be used to protect personnel from task hazards			
3.0 SITE CONTROL			
3.1 Written Site Control Plan or procedures incorporated in SSHP			
3.2 Elements of site control program are being implemented (buddy system, on- and off-site communications, etc.)			
3.3 Site control zones established and posted as per SSHP			
3.4 Site personnel following the standing orders for each zone			

EODT SITE COMPLIANCE CHECKLIST (continued)

COMPLIANCE ITEMS	In Compliance?		
	Yes	No	N/A
4.0 TRAINING PROGRAM			
4.1 All personnel have received the required 40 hour OSHA HAZWOPER training (or its equivalent) and annual refreshers if needed			
4.2 Personnel have received three day on-site supervised training and the Three Day Training Form has been signed by all personnel			
4.3 Management and supervisory personnel have received additional eight hour Management and Supervisor training			
4.4 Copies of all training certificates are available on site			
4.5 Emergency response personnel have been designated/trained to handle anticipated emergencies			
4.6 Site Hazard Information Training has been given to site personnel and documented IAW SSHP			
4.6.1 Employees informed of potential risks/hazards identified for each task they perform			
4.6.2 Employees notified of chemical, physical and toxicological properties of identified or suspected contaminants			
4.7 Hazard Communication Training has been given to personnel who work with products containing hazardous substances, to include a review of the relevant MSDSs			
4.8 Site personnel given OSHA required, task/hazard specific training, such as PPE, Hearing Conservation, etc. and training forms completed			
4.9 At least two site personnel are trained in First Aid/CPR			
4.10 Daily tailgate safety briefings and weekly safety meetings are being conducted and documented			
5.0 MEDICAL SURVEILLANCE			
5.1 Medical surveillance provided, as a minimum, to personnel who: are exposed at or above the PEL/TLV; use respirators; or are a member of emergency response team			
5.2 Provisions made for medical surveillance of personnel who receive a documented, unprotected over exposure or develop signs and symptoms of exposure			
5.3 Site specific medical tests, as required by the SSHP, have been conducted prior to site personnel participating in site activities where exposure can occur			
5.4 Physicians written statement retained in employees records, and a copy is available on site			
5.5 Personnel with potential occupational exposure to blood or other potentially infectious body fluids have been given the opprotunity to be vacinated against HBV, and personnel who decline have signed the HBV Vaccination Declarination Form			

EODT SITE COMPLIANCE CHECKLIST (continued)

COMPLIANCE ITEMS	In Compliance?		
	Yes	No	N/A
6.0 ENGINEERING CONTROLS, EQUIPMENT, WORK PRACTICES AND PPE			
6.1 Engineering controls and safe work practices (SWPs) being used when ever feasible			
6.2 Equipment required by the WP and SSHP is on site, inspected and in proper working order			
6.3 PPE selected according to the limitations of the PPE, site hazards, and level/type of hazard			
6.4 SCBA or positive pressure supplied airline with escape provided for known or potential IDLH conditions			
6.5 Level A suits are being used for operations where the potential exists for liquid or vapor contact with materials that are highly corrosive to the skin or toxic through skin aborption			
6.6 All PPE is being inspected, used, cleaned, stored and maintained in accordance with the SSHP and the written PPE program in the CSHP			
6.7 Respirators issued only to personnel who have training/medical approval to used respirators			
6.8 Personnel using respirators have been fit tested for the respirator being used			
7.0 MONITORING			
7.1 Monitoring equipment being calibrated, operated and maintained IAW manufacturer's requirements, and calibration, monitoring and maintenance records available			
7.2 Monitoring being conducted IAW the SSHP, to include to: potential IDLH or explosive conditions; personal exposures to chemical and physical hazards; exposures when a change in tasks or location occurs; or when previously unidentified materials/hazards are identified			
7.3 High-risk workers monitored initially and all workers monitored if levels indicate the need			
7.4 Work area and perimeter monitoring being conducted IAW the SSHP			
7.5 Site monitoring log being completed for all personnel and area monitoring			
8.0 HANDLING DRUMS AND CONTAINERS			
8.1 Drums and containers used on site meet DOT, OSHA and EPA regulations			
8.2 Drums and containers found on site are being inspected prior to being moved or handled			
8.3 Unlabeled drums and containers being handled as hazardous waste until identified otherwise			
8.4 Drum and container movement being minimized			
8.5 Drums/containers opened IAW approved methods listed in SSHP			
8.6 Containers assessed for radioactive waste			

EODT SITE COMPLIANCE CHECKLIST (continued)

COMPLIANCE ITEMS	In Compliance?		
	Yes	No	N/A
8.7 Drum sampling performed IAW the approved sampling plan			
8.8 Staging of drums and containers being conducted IAW the Staging Plan found in the SSHP			
8.9 DOT salvage drums and adequate spill response materials available and written spill containment program available			
8.10 Materials are asessed for compatability prior to being bulked together			
8.11 Shock sensitive waste being identified and handled appropriately			
8.12 Lab packs are opened by properly trained personnel			
8.13 Drums and containers being transported off site by an licensed hazardous waste hauler			
9.0 DECONTAMINATION PROGRAM			
9.1 Decontamination procedures developed/implemented prior to personnel/equipment site entry			
9.2 Site workers properly trained and complying with the written decontamination procedures			
9.3 All potentially contaminated equipment, clothing and PPE are being properly decontaminated			
9.4 Decontamination solutions are being properly containerized at the end of each day			
9.5 Decontamination procedures evaluated for effectiveness			
9.6 On site showers and change houses comply with 29 CFR 199.141.			
10.0 EMERGENCY RESPONSE AT UNCONTROLLED HAZARDOUS WASTE SITES			
10.1 This site is exempt from this section, no site personnel will be responsible for responding to a site emergency. All emergency response will be handled by off site agencies. An Emergency Action Plan, IAW 29 CFR 1910.38, is incorporated in the SSHP. (If Yes to this question, skip to Section 11.0, otherwise continue with the remainder of this Section)			
10.2 Written emergency response plan incorporated in SSHP			
10.3 Written procedures for reporting incidents to local, state and federal agencies			
10.4 Emergency response plan reviewed, rehearsed regularly and amended as needed			
10.5 Emergency phone numbers and hospital maps posted on site and placed in all vehicles			
10.6 First aid, burn and eye wash kits available on site and in each vehicle, with a bloodborne pathogen control kit located with each first aid kit			
10.7 Adequate type, number and size fire extinguishers properly located/inspected at least monthly			

EODT SITE COMPLIANCE CHECKLIST (continued)

COMPLIANCE ITEMS	In Compliance?		
	Yes	No	N/A
10.8 Flammable storage areas properly posted with "No Smoking, Matches or Open Flame Within 50 Feet" signs			
10.9 Employee alarm system on site and perceivable by site personnel			
11.0 ILLUMINATION			
11.1 No work being conducted on site till thirty minutes after sun rise or after thirty minutes before sunset, and adequate light levels maintained in all other work place facilities			
12.0 SANITATION			
12.1 Adequate supply of potable water available from appropriately labeled containers or outlets			
12.2 Non-potable water sources appropriately labeled and no open or potential cross connection to potable sources exists			
12.3 Appropriate type and adequate number of toilets available			
12.5 Wash facilities available and located near site but away from exposure potentials			
12.6 Site being maintained in a neat and orderly fashion, free of trash and debris			

REMARKS, OBSERVATIONS AND RECOMMENDATIONS

Signature of Auditor: _____ Date: _____

I acknowledge that I have been briefed on the results of this audit and will take any necssary corrective actions.

Site Safety and Health Officer	Date	Sr. UXO Supervisor / Project Manager	Date

EODT CERTIFICATION OF TASK HAZARD ASSESSMENT

TASK NAME: DATE:

1.0 Hazard Identification: Items checked are known or anticipated site hazards, or may occur as a result of site operations.

( ) Physical exertion	( ) Lifting hazards	( ) Confined space
( ) Heat Stress	( ) Slip, trip or fall	( ) Toxic/Hazardous plants
( ) Cold Stress	( ) High noise (>85 dBA)	( ) Toxic/Hazardous animals/insects
( ) Heavy equipment operations	( ) Overhead utilities	( ) Ultraviolet radiation
( ) Vehicle traffic in work area(s)	( ) Underground utilities	( ) Hand/Power Tool use
( ) Fire hazards (underline)	( ) Intrusive activity (underline)	( ) Airborne chemical exposure
• Gasoline/Diesel use	• Soil drilling	( ) Skin contact w/ hazardous materials
• Explosive materials	• Soil excavation	( ) Ordnance and explosives
• Explosive gases/vapors	• Setting trailer anchors	( ) Cut/Puncture from sharp objects

2.0 Degree of Hazard: Anticipated degree of hazard, based on the hazards associated with this task.

Chemical Hazard:	( ) Low	( ) Serious	**Phys./Bio. Hazard:**	( ) Low	( ) Serious
	( ) Moderate	( ) Unknown		( ) Moderate	( ) Unknown

3.0 Control or Protective Measures: Items checked will be used to control or mitigate the above mentioned hazards.

( ) Tailgate Safety Briefing	( ) Personal protective equipment	( ) Decontamination
( ) Specialized Training	( ) Air Monitoring	( ) Magnetometer Survey
( ) Safe Work Practices	( ) Site Control Zones	

( ) Engineering Controls: Tools with manufacturer supplied guards will be used with guards in place

( ) Applicable SOPs/Programs: Heat Stress, Hearing Conservation, the SSHP

( ) Other:

4.0 Task PPE: PPE has been assigned based on the potential for exposure as identified by this hazard assessment.

Level of Protection	( ) A ( ) B	( ) C ( ) D	( ) Modified
Respiratory Protection	( ) SCBA ( ) Escape SCBA - Size	( ) Full face respirator ( ) ½ Face respirator	( ) Cartridge - Type ( ) No respirator required
Protective Clothing	( ) Fully encapsulating suit ( ) Standard Tyvek	( ) Saranex ( ) PE Tyvek	( ) Company clothing ( ) Other:
Gloves (specify inner/outer)	( ) Nitrile ( ) Butyl	( ) Neoprene ( ) Latex	( ) Leather ( ) Cotton
Head/Face/Eye/Ear Protection	( ) Safety glasses ( ) Ear plugs/muffs	( ) Safety goggles ( ) Face shield	( ) Hard hat ( ) Other:
Foot/Leg Protection	( ) Leather boots ( ) Steel-toed leather boots	( ) Steel foot covers ( ) Kevlar leg chaps	( ) Chemical over boots - Material

5.0 Modifications Required:

6.0 Certification: The PPE and other control methods and procedures to be used in the conduct of this task have been selected as a result of a hazard assessment conducted by individual identified below.

Printed Name: Signature: _____

EODT PERSONAL CLOTHING/EQUIPMENT ISSUE LOG

Project Name:					Project Location:			
Contract No.:		Delivery Order No.:			Issued To:			
Item	Issued By	Date Issued	Size	Qty.	Received (initials)	Date Returned	Rec'd By (initials)	Condition *
Shirt								
Pants								
Coveralls								
T-shirt								
Leather Gloves								
Chaps								
Face Shield								
Ear Muffs			NA					
Hard Hat			NA					
Safety Glasses			NA					

Remarks/Condition of Returned Clothing/Equipment:

EODT PERSONAL PROTECTIVE EQUIPMENT TRAINING LOG

Name: _____ (Last / First / MI)	Employee No.: _____	SSN: _____ - _____ - _____

Completion of the information below certifies that the employee listed above has successfully completed the required PPE training specified. This training has included instruction related to: why, when and what PPE is needed; how to don, doff, adjust and wear the PPE; limitations of the PPE; and care, maintenance, useful life and disposal of the PPE.

Date	Type of PPE	Site Where Trained	Date	Type of PPE	Site Where Trained
	Safety Glasses				
	Hard Hat				
	Ear Plugs: Type:				
	Ear Muffs: Type:				
	Leather Gloves				
	Leather Boots				
	Steel-toed Boots				
	Face Shield				
	Chaps				
	Snake Leggings				
	Toe Protectors				

EODT OE OPERATIONS DAILY/WEEKLY REPORT

DATE:	LOCATION:	LOG NO.:
CONTRACT NO.:	DELIVERY ORDER NO.:	

WEATHER CONDITIONS: _____

I. WORK SUMMARY

A. WORK SCHEDULED: _____

B. WORK COMPLETED: _____

C. EXPLANATION OF VARIANCE: _____

D. INSPECTION RESULTS: _____

II. INSTRUCTIONS RECEIVED FROM GOVERNMENT REPRESENTATIVE(S)

EODT OE OPERATIONS DAILY/WEEKLY REPORT

III. SAFETY COMMENTS:

IV. UXO SUMMARY

A. UXO/OE LOCATED

DESCRIPTION	ID NO.	QTY.	DISPOSITION

B. DEMOLITION SUPPLIES USED:

DESCRIPTION	QTY.
DETONATORS, ELECTRIC	
DETONATORS, NON-ELECTRIC	
DETONATION CORD	
PERFORATORS (JETX)	
TIME FUZE	
SMOKELESS POWDER	
GREEN STICK	

C. SCRAP GENERATION / DISPOSITION: _____

EODT OE OPERATIONS DAILY/WEEKLY REPORT

V. PERSONNEL / EQUIPMENT UTILIZATION

A. PERSONNEL ON SITE

LABOR CATEGORY	NUMBER	MAN-HOURS	REMARKS
Civil Engineer			
Geophysicist			
GIS Manager			
Project Manager			
Quality Control Specialist			
Senior UXO Supervisor			
Site Safety and Health Officer			
UXO Supervisor			
UXO Specialist			
UXO Assistant			
Geophysical Instrument/Mag Operator			
Drafter 1 / Mapping Tech			
Heavy Equipment Operator			
Surveyor Aid			
Surveyor			
Field Office Administrator			
Environmental Scientist			
CIH / Program Safety & Training			
Program QC/QA			
GIS / Data Specialist			
Equipment Operator			
Contract Administrator			
Program Administrator			
Word Processor			
Laborer			
Program Manager			
SUBCONTRACTOR PERSONNEL (List by Category)			

EODT OE OPERATIONS DAILY/WEEKLY REPORT

V. PERSONNEL / EQUIPMENT UTILIZATION (continued)

B. EQUIPMENT USED ON SITE

DESCRIPTION	QTY.	HOURS	SOURCE	REMARKS
Backhoe, Wheeled / Tracked				
Bull Dozer				
Bush Hog				
Chain Saw				
Differential Global Positioning System				
Excavator, Tracked				
Magnetometers				
Radio, Base Station				
Radio, Hand Held				
Top Con				
Truck, Heavy (4-wheel drive)				
Truck, Light				
Truck, Pick-up				
Vehicle (All Purpose, 4-Wheel Drive)				
Vehicle-All Purpose Utility (APUV)				
Vehicle (Sedan)				
Vehicle (Van)				
Gas Powered Brush Cutter				
Other Equipment (List)				

VI. COMMENTS / CONCERNS

VII. SIGNATURES / DATE

Sr. UXO Supervisor	Date	Site Safety and Health Officer	Date

EOD TECHNOLOGY, INC.

Personal Data Sheet

Name: _____ Date: _____

Address: _____

_____

_____

Telephone: ( ) _____ SSN: _____

DOB: _____ Place of Birth: _____

Driver's License No.: _____ State: _____ Expiration Date: _____

Height: _____ Weight: _____ Hair Color: _____ Eyes Color: _____

Glasses: Yes ( ) No ( ) Inserts Yes ( ) No ( ) Mask Type: _____

Mask Size: Large Medium Small (Circle One) Fit Date: _____

Trouser Size: _____ Shirt Size: _____ Shoe Size: _____

OSHA Certification Date: _____ Medical Surveillance Date: _____

CPR Certification Date: _____ First Aid Date: _____

Any Physical Limitations: No ( ) Yes ( ) If yes, please explain: _____

_____

Emergency Medical Information

Medications (list): _____

Allergies (list): _____ Blood Type: _____

Emergency Notification

Person to Contact in Case of Emergency: _____

Home Phone Number: ( ) _____ Work Phone Number: ( ) _____

Home Address: _____

_____

Authorization For Treatment

I authorize examination and treatment of myself by the Emergency Department of a competent medical facility nearest to the location of my employment. I authorize a copy of my medical records to be sent to the physicians/facility providing the treatment, if deemed necessary by the treating physicians.

Signature: _____ Date: _____

EODT GRID TRACKING LOG

FOR OE OPERATIONS

DATE:	LOCATION:		
CONTRACT NO.:		DELIVERY ORDER NO.:	PAGE NO.:

Grid No.	Placement Verified	Cleared or Grubbed	Mag'd & Flagged	Anomalies Investigated	QC Audit	Demo UXO/OE Vent / Destroy

EODT GRID SURVEY SUMMARY LOG FOR OE OPERATIONS

(To be used in conjunction with OE Operations / QC Grid Map)

DATE:	LOCATION:	GRID NO.:	PAGE:
CONTRACT NO.:	DELIVERY ORDER NO.:	TEAM LEADER:	

Item No.	Description	No. Pieces	Fuse Type & Condition	Fill Type	Depth	Condition/State of Degradation	Comments

EODT QUALITY CONTROL INSPECTION AND AUDIT LOG

FOR OE OPERATIONS

DATE:	TIME:	LOG NO.:
CONTRACT NO.:	DELIVERY ORDER NO.:	
LOCATION:		
WEATHER CONDITIONS:		

I. AREAS INSPECTED: (List by grid number, coordinates or description)

II. INSPECTION RESULTS:

III. CORRECTIVE ACTIONS RECOMMENDED (If required):

IV. REINSPECTION RESULTS (If required):

V. SIGNATURES:

I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

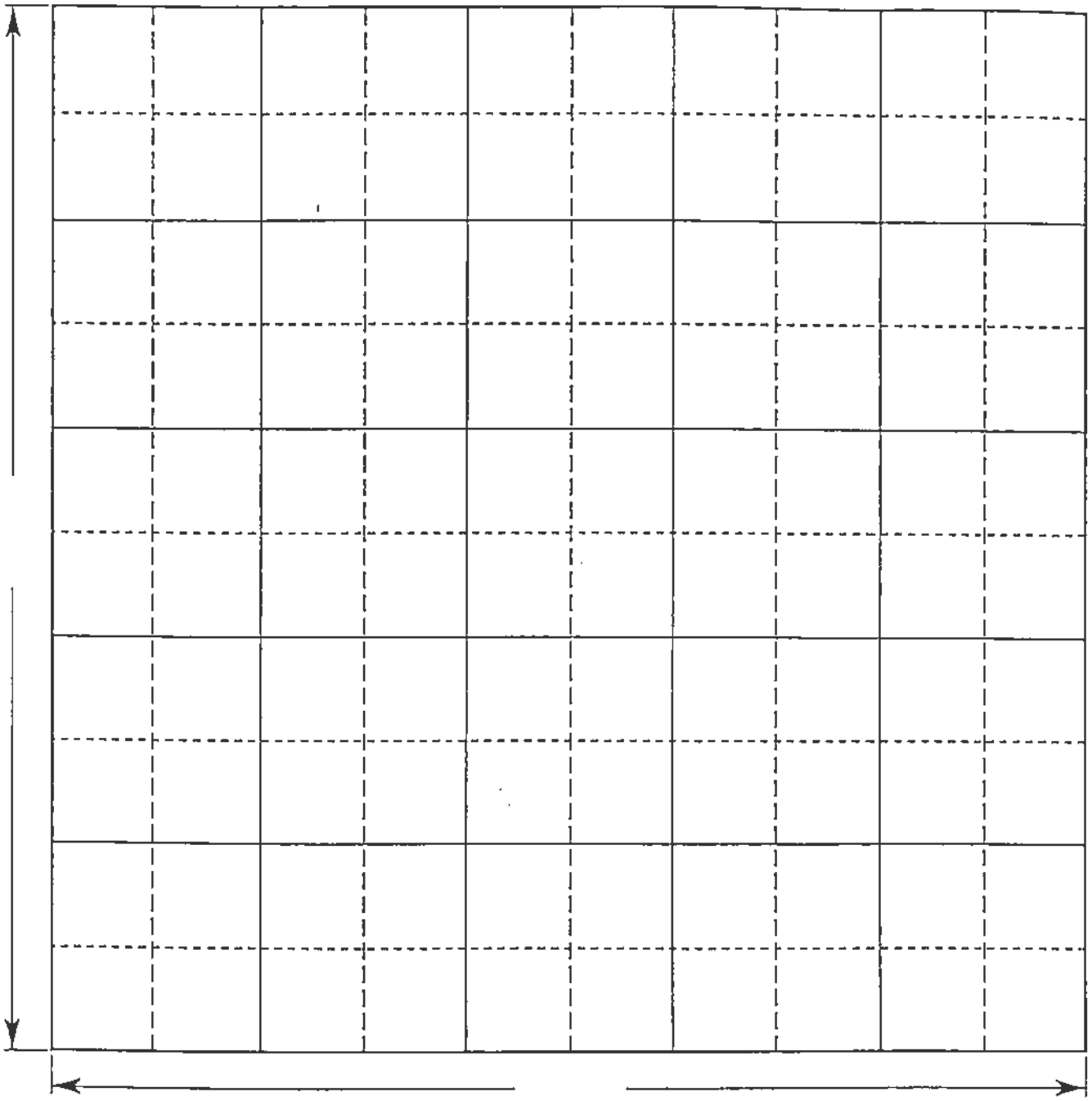
Quality Control Specialist

Sr. UXO Supervisor / Project Manager

EODT OE OPERATIONS GRID MAP

(To be used in conjunction with EODT Grid Summary Survey Log)

DATE: _____ GRID NO: _____



NOTES: _____

LEGEND

- Surface UXO/OE
- Subsurface Anomalies
- Subsurface UXO/OE
- Restricted Area Boundary

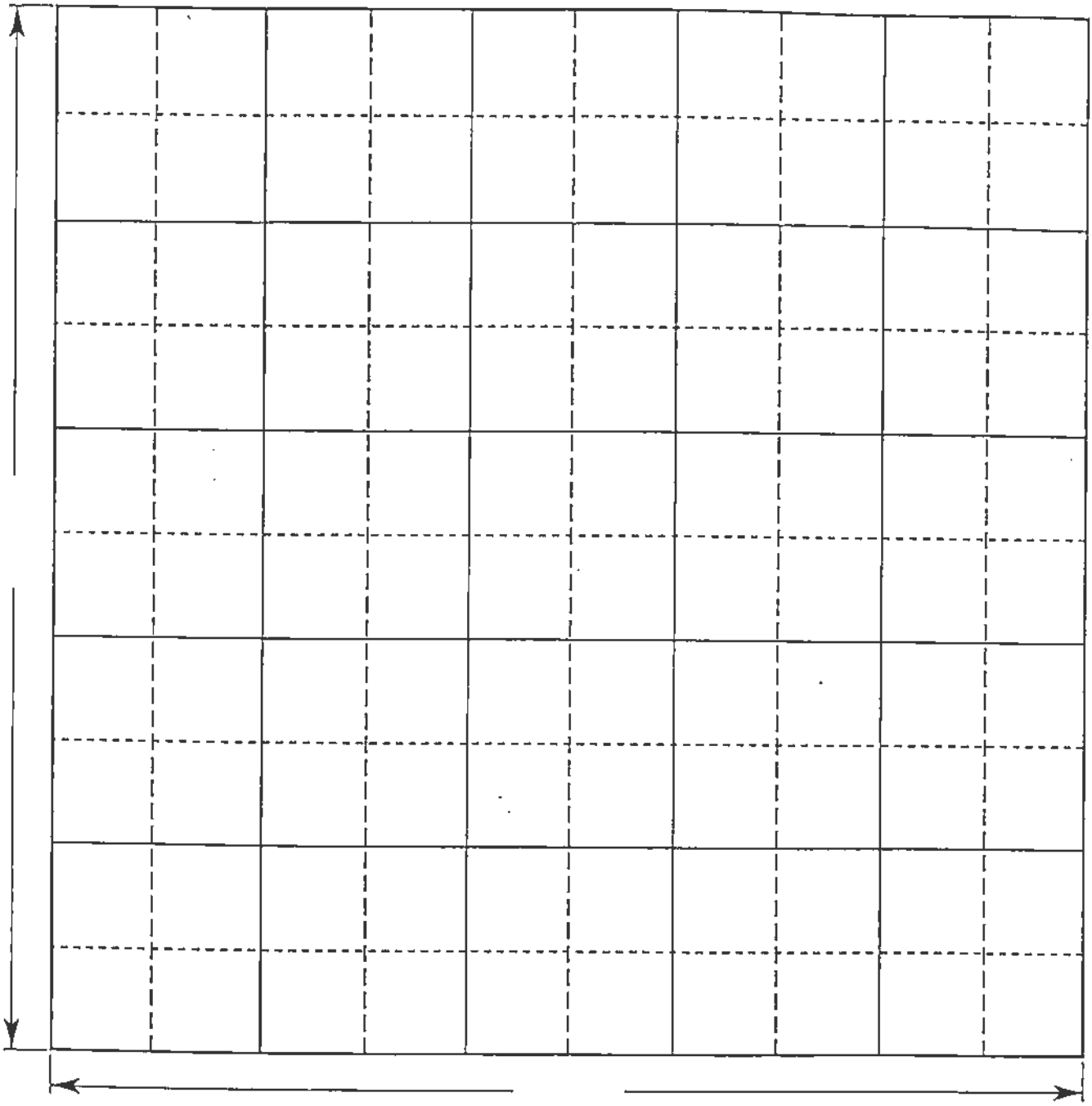
Map Orientation

alb/eodforms/oeopsgrd.ged

EODT QUALITY CONTROL GRID MAP

(To be used in conjunction with EODT Quality Control Inspection and Audit Log)

DATE: _____ GRID NO.: _____



NOTES: _____

LEGEND

- Surface UXO/OE
- Subsurface Anomalies
- Subsurface UXO/OE
- Restricted Area Boundary

Map Orientation

EODT DEMOLITION SHOT RECORD

Site Name/Location:			Date:
Shot Location (OB/OD Range or Grid No.):	Demolition Supervisor:		State License # (if applicable):
Type of UXO/OE Destroyed, Vented or Burned:		Firing Method:	Time of Shot:
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		Temp: _____ Wind Dir./Speed: _____ Ceiling: _____ Clouds/% Sun: _____	
Type and Amount of Tamping Used:		Mat or Other Protection Used (list):	
Seismographic / Sound Level Meter Used: Yes ☐ No ☐		Readings / Results:	

Demolition Materials Used

Description	Amount	Description	Amount
Perforator		Time Fuze	
Det Cord		Squibs	
Electric Detonator		Black / Smokeless Powder	
Non-electric Detonator		Two Component	
Non-El Detonator		Other (list)	

Certification

I certify that the explosives listed were used for their intended purpose, and that the UXO/OE listed were rendered inert/destroyed.

Signature of Demolition Supervisor: _____ Date: _____

Site Name/Location:			Date:
Shot Location (OB/OD Range or Grid No.):	Demolition Supervisor:		State License # (if applicable):
Type of UXO/OE Destroyed, Vented or Burned:		Firing Method:	Time of Shot:
Direction and Distance to Nearest Building, Road, Utility Line, etc.:		Temp: _____ Wind Dir./Speed: _____ Ceiling: _____ Clouds/% Sun: _____	
Type and Amount of Tamping Used:		Mat or Other Protection Used (list):	
Seismographic / Sound Level Meter Used: Yes ☐ No ☐		Readings / Results:	

Demolitioo Materials Used

Description	Amount	Description	Amount
Perforator		Time Fuze	
Det Cord		Squibs	
Electric Detonator		Black / Smokeless Powder	
Non-electric Detonator		Two Component	
Non-El Detonator		Other (list)	

Certification

I certify that the explosives listed were used for their intended purpose, and that the UXO/OE listed were rendered inert/destroyed.

Signature of Demolition Supervisor: _____ Date: _____

EODT EQUIPMENT DATA AND PRICE QUOTE SHEET

Description of Item/Service: _____

Application/Justifcation: _____

Specifications: _____

Units Required:	Pricing Required:	Payment Required:	Availability:
Vendor Information	Vendor	Vendor	Vendor
Name:			
Address:			
Telephone:			
Facsimile:			
Point of Contact:			
Quoted Price:			
Terms/Conditions:			
Remarks			

(Attach Additional Sheets if Needed)

For Purchasing Use Only

Selected Vendor: _____ Pricing: _____

Justification: _____

EODT OUTGOING CORRESPONDENCE LOG

No.	Date	Brief Description of Title / Subject	Sent By	Sent To		Logged In By
				Name	Organizniton	

EODT INCOMING CORRESPONDENCE LOG

No.	Date	Brief Description of Title / Subject	Sent By		Sent To	Logged In By
			Name	Organizaiton		

EODT TELEPHONE CORRESPONDENCE RECORD

Site Name and Location:	Contract Number	Delivery Order Number:

Date	Time	Call From		Call To		Phone No.
		Name	Organization	Name	Organization	

Subject / Summary of Discussion: ______________________________

Actions to be Taken: ______________________________

Date	Time	Call From		Call To		Phone No.
		Name	Organization	Name	Organization	

Subject / Summary of Discussion: ______________________________

Actions to be Taken: ______________________________

Date	Time	Call From		Call To		Phone No.
		Name	Organization	Name	Organization	

Subject / Summary of Discussion: ______________________________

Actions to be Taken: ______________________________

Date	Time	Call From		Call To		Phone No.
		Name	Organization	Name	Organization	

Subject / Summary of Discussion: ______________________________

Actions to be Taken: ______________________________

EODT GOVERNMENT PROPERTY TRACKING LOG

roject Location:	Contract Number:	Delivery Order Number:

Line No.	Description	Model	Serial or ID Number	Quantity Received	Date Received	Unit Price	Owner/ Supplier	Responsible Site Person(s)

EODT DOCUMENT CONTROL REGISTER

Document ID Number	Type of Document (log, disk, form)	Document Title	Custodian	Location	Remarks

EODT

KEY CONTROL LOG

Key Number	Key For	Date/Time Out	Issued To (Name)	Date/Time In	Returned To (Initials)

EODT ORDNANCE ACCOUNTABILITY LOG

Project Site: _____ Contract #: _____ Log Page : ____

Date (m/d/y)	Qty/ Unit	Descriptive Nomenclature [1]	Fuze Type and Condition [2]	Location [3]	Depth	Disposition [4]	Verified By [5]	Photo Y/N

1 Description, with MK numbers, M number and Mods as applicable.
2 Use M number, MK numbers and Mods as applicable, UNK = "Unknown", None or N/A = "No fuzing present".
3 Include: Area & Sub-area designation or map reference.
4 Enter Heading(s) and Date. Headings: DST = "Destroyed", MAG = "Magazine Holding Area", EOD = "Turned over to local EOD for disposal", DRMO = "Scrap turned into Defense Reutilization", BIP = "Blown-in-place".
5 Initials - Site Supervisor/Sr. UXO Supervisor to verify Recovery/Disposal.

EODT EXPLOSIVES PURCHASE/RECEIPT AUTHORIZATION LIST

Address and County: _____

_____

Federal License #: _____ Expiration Date: _____

The following persons are agents, employees, or representatives of the undersigned, and are authorized to order or acquire explosive materials on behalf of EOD TECHNOLOGY, INC.:

Name and Home Address	Driver's License No.	Soc. Sec. Number	Place of Birth

The undersigned certifies the foregoing information to be true and correct to the best of his knowledge and belief, and that he will communicate any additions or deletions to the foregoing list to EOD Technology, Inc.

_____	_____
Corporate Officer	Date

EODT EQUIPMENT AND SUPPLY HAND RECEIPT TRACKING FORM

Location:				Contract No.:			Delivery Order No.:
Item	Serial No. (if applicable)	Issued To	Date Out	Quantity Out	Date In	Quantity In	Remarks

APPENDIX F

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

RESUMES

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

TABLE OF CONTENTS

1.0 GENERAL

Upon receipt of the Notice to Proceed, and prior to mobilization, EODT will submit to the CEHNC for approval, the resumes for the additional UXO-qualified personnel which will be needed for the successful completion of this Task Order.

2.0 RESUMES

This appendix contains the resumes for the management and supervisory personnel listed below, which EODT proposes to use for the execution of the work associated with this Task Order.

- Jeffrey Bleke, Program Manager
- John Scott, Project Manager
- Andrew Bryson, CIH
- Michael Short, QC Manager
- Salvatore Molle, Senior UXO Supervisor

3.0 OSHA TRAINING

Prior to mobilization, EODT will ensure that all personnel assigned to this project will have received the training required by OSHA in 29 CFR 1910.120. EODT will further ensure that a copy of the 40-hour, and any applicable 8-hour refresher, certificates for all site personnel will be on file in the project field office.

4.0 MEDICAL SURVEILLANCE

Prior to mobilization, EODT will ensure that all EODT site personnel assigned to this project are enrolled in the medical surveillance program as required by the EODT Corporate Safety and Health Program and by OSHA in 29 CFR 1910.120. As proof of participation in the medical surveillance program, a copy of the physician's statement for each person assigned to the project will be on file at the field office.

JEFFREY P. BLEKE, P.E.
PROGRAM MANAGER

CITIZENSHIP	USA
B.S., CIVIL ENGINEERING	1980
REGISTERED PROFESSIONAL ENGINEER	1985
PROFESSIONAL EXPERIENCE	16 YEARS

EDUCATION/TRAINING

- B.S. Civil Engineering, Louisiana State University, 1980
- Registered Professional Engineer, 1985
- American Society of Civil Engineers
- Florida Engineering Society
- National Society of Professional Engineers

PAPERS

- *Characterization of Ordnance at Formerly Used Defense Sites*; American Defense Preparation Association (ADPA) 1994; J. Bleke, R. Young, B. Peterman, Dr. Ann Shortell

EXPERIENCE SUMMARY

Experienced managing multi-million dollar contracts for USACE.

Mr. Bleke, among the nation's most experienced Professional Engineers in the ordnance field, has over 16 years professional and practical experience in engineering, design, and management. Most recently Mr. Bleke managed the CPFF contract with CEHNC, which included both HTRW and ordnance projects. A registered Professional Civil Engineer, he also served as the Project Engineer (PE) in charge at 20 Formerly Used Defense Sites (FUDS) in the Continental United States (CONUS), the Virgin Islands, and Puerto Rico. Positions have included major roles in Project/Program Management, Remedial Construction, Office Management, Project Design, Incineration Design and Operations, RCRA Facility Investigations, Corrective Measure Studies, Ordnance Site Investigations, and Characterizations and Marketing.

PROFESSIONAL EXPERIENCE

1992-1996 **Program Director, U.S. Army Corps of Engineers (USACE) Programs,** *Environmental Science and Engineering, Inc. (ESE), Gainesville, FL*

Managed over $50 million in contracts for several USACE districts, including Huntsville, Mobile, Jacksonville, Ft. Worth, Kansas City, Savannah, Omaha, Tulsa, and Sacramento. Contracts included Cost Plus Fixed Fee (CPFF), Firm fixed Price (FFP), and Cost Plus Award Fee (CPAF) types. Supervised over 100 Project Managers and support staff. Managed all subcontractors.

Project Director, *Site Sampling/Groundwater Monitoring to Amend Existing RI/FS Reports, DDRC Defense Logistics Agency Facility,* Shelby County, TN - CEHNC

- Provided analysis for existing monitoring wells and modified an existing RI/FS report in accordance with EPA QAMS 005/80 format.

Project Director/Project Manager, *Site Characterization and Remedial Designs, Engineering Evaluations and Cost Analyses (EE/CAs), Ordnance Removal at FUDS* - CEHNC

Sites included:

Camp Sibert	Camp Croft	Southwest Proving Grounds
Withalochoee Air Field	Ft. Segerra	Camp Green
Laurenburg-Maxo AFB	Culebra Island	Indian Rocks Beach
Brooksville Army Air Base	Camp Claiborne	Ft. Pierce

- Performed studies under CERCLA to determine areas contaminated or potentially contaminated with chemical agents or conventional ordnance. Estimated the nature and amount of contamination.
- Performed archive searches on the specific sites and used the data to follow-up with geophysical investigations at the FUDS.
- Submitted investigation data to the required agencies as detailed site characterization reports. Provided recommendations for the removal design or remedial actions for each location.
- Each project valued at an average of $600,000
- Involved extensive coordination with subcontractors, regulatory agencies, several USACE districts, and the public.

Project Manager, *RCRA Facility Investigation (RFI),* Redstone Arsenal, AL - CEHNC

- Investigated potential contamination of soils and groundwater in and around six Solid Waste Management Units (SWMUs).
- Prepared work plan, performed soil gas surveying, prepared site, drilled and sampled monitoring wells, and wrote the RI report.

Project Director, *Water Treatment System Construction and Operation, USACE Sacramento District,* Sharpe Army Depot - Lathrope, CA

- Constructed a 350-gallon-per-minute carbon water treatment system that treated TCE-contaminated water.

- Estimated and staffed the $2.7 million project.
- Constructed a bermed holding pond and connected over 3 miles of trenched 4- to 6-in.-diameter PVC pipe to existing extraction and injection wells. Constructed the treatment/equipment pad and drainage ditches.
- Supplied Operations and Maintenance (O&M) support for the plant for one year.

Project Manager, *Incinerator Specification and Design,* Confidential Client

- Wrote specifications for incineration and related equipment for a CERCLA remediation and incineration

project, including baghouse, rotary kiln, rotary drier, materials handling system, ash quench system, secondary combustion chamber, and emergency backup system.

Project Director, *Corrective Action Management Plan (CAMP)*, Redstone Arsenal, AL - CEHNC

- Directed CAMP report activities to define and prioritize over 200 SWMUs.
- Used report as a basis for further action at the facility following RCRA guidelines.

Project Director, *Corrective Measures Study (CMS)*, Redstone Arsenal, AL - CEHNC

- Directed the CMS, which evaluated alternatives for cleaning up 10 SWMUs.
- Based recommendations on contamination type, available technologies, innovative technologies, and cost.
- Used report as a basis for further RCRA action at the site.

Assistant Project Manager, *RCRA Facilities Investigation*, PANTEX, Amarillo, TX - USACE Tulsa District

- Assisted the Project Manager in contract performance.
- Drilled and sampled 11 wells to characterize and delineate potential contamination from site activities.
- Assisted in subcontractor management and project budgeting.

1986-1992 **Senior Project Manager/Project Manager/Senior Engineer**, *IT Corporation*, Port Allen, LA

Project Manager for large remediation and remedial construction contracts. Recognized as one of the most senior construction managers in the corporation. Performed many projects under the Omaha Rapid Response contract and for other USACE agencies. Projects included:

Project Director, *Rinsewater Pond Phase II Surface Pond Closure*, New Orleans, LA - Martin Marietta Manned Space Systems, Inc.

- Managed all remediation aspects and closure for a surface pond.
- Wrote proposal, negotiated contract, and submitted certified cost data to client for project implementation.
- Assigned Project Manager and Site Manager for site engineering and remediation.
- Prepared detailed Work Plan (WP), Health & Safety Plan, and Construction Quality Assurance Plan (CQAP).
- Reviewed final report.

Project Manager, *Underground Storage Tank (UST) Closure*, Fort Riley, KS - USACE Omaha District

- Initiated action within 14 days of notification, as specified by this National Rapid Response contract.
- Implemented immediate removal and closure of USTs located on the base.
- Reviewed the WP, CQAP, and Health & Safety plans.
- Submitted and negotiated project cost.
- Wrote specific software formatted IAW USACE specifications to perform cost tracking.

Project Manager, *Site Assessment for Contaminated Wetlands*, Lake Charles, LA - Confidential Client

- Managed all assessment aspects for a large Chemical Manufacturer's accidental discharge of hazardous waste into a wetland area.
- Worked with Federal, state, and local authorities to develop a WP to contain, remove, and treat the contaminated soils.
- Represented the client in negotiations and oversaw all contractors.

Project Manager, *Environmental Consulting*, Port Hudson, LA - Confidential Client

- Managed human and material resources in implementing various engineering projects at a large pulp and paper mill.
- Directly oversaw all engineering design, landfill monitoring, UST closures, dewatering, waste minimization, permitting, and remediation activities for the facility.

Project Manager, *Site Cleanup*, New Orleans, LA - Martin Marietta Manned Space Systems, Inc.

- Managed demolition and cleanup of a parts treatment center.
- Completed asbestos removal and disposal of large volumes of hazardous and non-hazardous materials.
- Performed work in accordance with all applicable local, state, and Federal regulations.

Project Manager, *Rapid Response Cleanup and Closure*, Fort Buchanan, Puerto Rico - USACE Omaha District

- Managed cleanup of a facility contaminated with pesticides, asbestos, and polychlorinated biphenyls (PCBs).
- Coordinated with Federal and local authorities to safely remove contaminated materials.

Site Manager, *Landfill Construction and Remediation*, Carson, CA - Confidential Client

- Managed all aspects from proposal and contract negotiations to construction and completion of a 64-acre landfill site.
- Removed and placed asbestos-containing material (ACM) in an onsite landfill.
- Coordinated activities with local, state, and Federal authorities.
- Managed public relations with the local populace and news media.
- Contract valued at $5 million.

Senior Project Engineer, *Engineering and Design, Hybrid Thermal Treatment System (HTTS)*, Knoxville, TN - IT Corporation

- Managed the design and specification of the HTTS transportable incineration system, which was later successfully used for the destruction of regulated hazardous materials, including TNT, RDX, and PCBs.
- Secured the project team for all associated equipment specifications, including feed system, rotary kiln, hot duck, secondary combustion chamber, quench, and scrubber system.

Project Engineer/Site Management, *TNT-, UXO-, and RDX-Contaminated Sites*, Cornhusker Army Ammunition Plant (CAAP), Grand Island, NE and Louisiana Army Ammunition Plant (LAAP),

Minden, LA - USACE Omaha District

- Remediated 60,000³ yards of UXO-, TNT-, and RDX- contaminated soils from "Pink Water" lagoons. Removed the soils from the lagoons, de-watered them, and reduced their volume. Processed the water into the onsite carbonated treatment system. Examined and loaded the soils into a screening device and removed large (> 6-in.-diameter) pieces.
- Transported the remaining soils to the subcontractor-supplied materials handling building for additional screening before being processed into the incineration system. Fed the materials into the incineration system. Sampled and placed materials in an onsite landfill (constructed as part of the contract).
- Designed a water collection system for the site.
- Incinerated TNT- and RDX-contaminated soils (less than 10% explosives by volume) and constructed landfills to contain the resulting ash.
- Managed a staff of professional, remediation, and maintenance personnel.
- Negotiated contract changes with the USACE Omaha and implemented engineering design changes including field changes.
- Interacted with Federal and state officials and provided public relations support.
- Increased plant operation efficiency—particularly soils recovery, wastewater treatment plant, and the feed and ash handling systems.
- Total contract value of $30 million.
- Conducted these projects continuously over a three-year period, which required significant logistical support for the 60-man operation.

1984-1986 **Manager of Engineering/Project Manager**, *Shirco Infrared Systems* - Dallas, TX

Managed the engineering, design, and start-up of the world's largest mobile infrared incinerator. Designed the incinerator to thermally destruct PCBs and dioxins. Used the system to successfully destroy contaminated soils at a number of former steel plant locations throughout Florida. Conducted trial burns and obtained the necessary RCRA permits. Negotiated the contract with the client companies that purchased the system.

Startup Manager, *Incineration, Superfund Site*, Florida Steel Corporation - Indiantown, FL

- Remediated a Florida Superfund Site (NPL Site 238) contaminated with PCBs.
- Excavated PCB-contaminated soils, placed them in storage areas, and processed them through an RCRA-permitted infrared thermal system.
- Oversaw system start-up and commissioning.

1980-1984 **Plant Associate Civil Engineer**, *Armco Steel Corporation, Steel Division*, Houston, TX

Performed Civil Engineering duties for a large steel mill operation, including foundation design, plant surveying, structural design, air quality permitting, wastewater process plant design, furnace design and modifications, and environmental engineering.

Construction Engineer, *Houston Works Plant Recuperation System*

- Implemented a $75 million re-fit of plant furnace equipment. Installed equipment and recuperated heated

gasses for energy savings throughout the entire plant.

Design Engineer, *Foundation Design*, Sinter Plant Baghouse

- Designed foundation support for a large expansion project for the Houston Works.

Project Engineer, *Air Quality Analysis*, Houston Works

- Surveyed all stacks to define the emissions of solids into the atmosphere surrounding the facility.

JOHN D. SCOTT, M.S.C.E., P.E.
PROJECT MANAGER

CITIZENSHIP	USA
PROFESSIONAL EXPERIENCE	20 YEARS
MASTER OF SCIENCE, CIVIL ENGINEERING	1971
REGISTERED PROFESSIONAL ENGINEER	1972

EDUCATION/TRAINING

- M.S.C.E., Environmental Engineering, Syracuse University, 1971
- B.S.C.E., Civil Engineering, Syracuse University, 1970
- Professional Engineer, New York, 1972
- Professional Engineer, Florida, 1980
- Member, American Society of Civil Engineers

EXPERIENCE SUMMARY

Mr. Scott has over 20 years of professional responsibility managing and performing engineering design in the diverse areas of water, wastewater, and solid waste management, including water supply, treatment, and distribution; sewage collection sampling, treatment, and disposal; industrial waste flow reduction, collection, treatment, and disposal; and landfill closure design. Extensive experience performing for the US Army Corps of Engineers, Huntsville District. Project management experience.

Areas of Specialization:
- ***Remedial Action Plans***
- ***Water/Wastewater Treatment Facilities***
- ***Stormwater Remediation Plans***
- ***Industrial Waste Disposal/Treatment***
- ***Solid Waste Disposal Studies***

PROFESSIONAL EXPERIENCE

1986-1996 **Chief Engineer, Environmental Science & Engineering, Inc. (ESE) - Gainesville, FL**

Specific project experience includes the following:

Project Manager, USACE Huntsville District - Hope Phase I Site Prioritization Report (SPR)

- Characterized and prioritized 37 Time Critical Removal Action (TCRA) sites and 120 Engineering Evaluation/Cost Analyses (EE/CAs).
- Prepared a Work Task Proposal Plan (WTPP), a Health and Safety Plan (HSP), and a Site Prioritization Report (SPR).
- Conducted an extensive site visit. Collected data, and attended meetings as required.

Project Manager, USACE Huntsville District - Hope Phase II EE/CA

- Magnetically surveyed, flagged, removed and detonated UXO on 120 100' by 200' sites (approximately 60 acres).
- Prepared a Work Plan (WP), determined OEW presence, prepared an EE/CA Report, prepared an EE/CA memorandum, collected data, and conducted a Safety Risk Assessment (SRA).
- Attended meetings as required and assisted with public involvement.

Project Engineer, USACE Huntsville Division - Former Brooksville Army Field, FUDS

- Assisted in managing a site characterization investigation to safely locate and identify suspected burial pits and trenches possibly containing UXO, OEW, and CWM.
- Prepared a comprehensive WP (including a complete SHERP).
- Conducted a records review and archive records search, which included: interviews, searching Government records, advertising in local newspapers and publications, and producing a report which summarized the findings.
- Performed site reconnaissance and non-intrusive geophysical investigations, including using of DANS® and producing maps which indicated anomaly locations.
- Performed land surveys and mapping and wrote the site characterization report which summarized the efforts and made recommendations for further activities.

Project Manager, USACE Huntsville Division - Former Camp Sibert Phase I FUDS

- Managed a site characterization investigation to safely locate and identify suspected burial pits and trenches possibly containing UXO, OEW, and CWM at the former Chemical Warfare Training Facility.
- Prepared a WP, a SHERP, conducted records reviews, and searched archive records.
- Performed geophysical investigations and high impact area investigations.
- Surveyed and mapped site and wrote the site characterization report.

Project Manager, USACE Huntsville Division - Former Camp Sibert Phase II FUDS

- Managed the continuation of Phase I to determine the nature and amount of UXO and OEW. The Phase II investigation focused on conventional munitions impact areas and ranges within the Former Camp Sibert installation.
- Prepared a WP, SHERP, conducted records reviews, evaluations, and geophysical investigations.
- Performed survey and mapping, determined OEW presence, and wrote the site characterization report.

Project Engineer, USACE Huntsville Division - Laurinburg-Maxton Army Base FUDS

- Assisted managing a site characterization investigation to safely locate and identify suspected burial pits and trenches that possibly contained UXO, OEW, and CWM.
- Prepared a comprehensive work plan (including a complete SHERP).
- Conducted a records review and archive records search which included interviews, searching

Government records, advertising in local newspapers and publications, and producing a report which summarized the archives search findings.

- Performed site reconnaissance and non-intrusive geophysical investigations, which included using DANS® and producing maps which indicated anomaly locations. Conducted land surveys and mapping.
- ® Wrote the site characterization report, summarizing the efforts and made recommendations for further activities.

Assistant Project Manager, USACE/Kansas City District - Landfill Remediation, Pitman, NJ

- Designed the haul roads, supervised the contract drain map production, and managed the subtask managers for the stormwater and mechanical portions of this project.
- Completed the 100% technical drawings package encompassing over 50 sheets.
- Estimated construction cost for offsite remediation at approximately $100 million.

Project Manager, USACE/Kansas City District - Landfill #13 Closure, Fort Benning, GA. Prepared plans, specifications, closure documents, and cost estimates. A unique project aspect included a clay shell examination, slope probability evaluation, and side slope optimization.

Project Manager, Confidential Client - Environmental Restoration, Southwestern U. S. Prepared the FOPs and RFI fieldwork for a former cooling tower investigation and the Zone 12 Groundwater Assessment Project. Installed 11 nontarring wells and 6 shallow borings. The six-month field effort included mobilization and demobilization, management, and complex site logistics.

Project Engineer, Confidential Client - Offsite Groundwater Remediation System Design and Construction Oversight, State of Florida. System design included submersible pumps, piping and automated control system design. Project also included permitting of tank and bore crossings for mechanical and electrical conduits. Interfaced with County Roadway Department for permitted crossing requirements.

Project Engineer, USACE Kansas City, MO - Tacoma South Channel Wheel 12A, Tacoma, WA. Updated and revised operation and maintenance manual for proposed soil aeration systems. Prepared additions to process flow and instrumentation schematics.

Project Engineer, Western Waste Industries - Reliable 29B Facility, Non-Hazardous Oil Waste Injection System, Livonia, LA. Project involved process design and tankage for non-hazardous oil waste physical separation and brine injection of wastewater. Designed by-products handling and process controls.

Project Manager/Utilities Coordinator, Hillsborough County, FL - US 301 Utilities and Utilities Related Relocation Project. Project involved approximately 15 miles of roadway improvements with a $3.5 million utilities relocation-only contract. Utilities relocated included Sanitary Sewer, Water, AT&T Fisher Optic Cable, GTE Telephone, and Tampa Electric's

Utilities. Project continued over 1 1/2 years. Unique design included utility crossing (aerial/over a new bridge) on the Alafin River in Riverveen, Florida.

Project Manager/Utilities Coordinator, Parsons Avenue Utilities Relocation Project - Hillsborough County, FL. Relocated sanitary sewer lift station, force main, and gravity collection lines. Relocated water lines due to 10 miles of roadway improvement. Project lasted one year.

Project Engineer, Remedial Action Plan Preparation/Tank and Line Retrofit for 18 Shell Service Stations. Assessed pressure integrity of existing steel tanks, performed contamination assessments, and installed new systems. Conducted soil remediation via onsite burning.

Project Engineer, Hillsborough County, Florida - Wastewater Treatment Plant Design, Upgrade and Renovation, Bloomingdale and Buckhorn Golf courses. Spray irrigated treated effluent at unrestricted access standards at Bloomingdale and Buckhorn Golf Courses. Treatment process included sand and activated carbon filters. Treatment plant cost $4,000,000.

Project Engineer, Bloomingdale and Buckhorn Golf Courses - Irrigation System Design for Treated Effluent. Designed the system for Bloomingdale and Buckhorn Golf Courses in Hillsborough County, Florida and cost $2,500,000.

Project Engineer, Silver Oaks Golf Course, Pasco County, FL - Treated Effluent Irrigation System Design. Designed the system for the Silver Oaks Golf Course which cost $1,500,000.

Project Engineer, St. Leo Golf Course, Pasco County, FL - Pilot Project Spray Irrigation of Treated Effluent. Completed the project for the St. Leo Golf Course, which cost $500,000.

Project Manager and Engineer, Runoff and Permitting Services - Chemical Dynamics, Plant City, FL. Project involved separation of stormwater/phosphate fertilizer runoff and permitting through Hillsborough County Environmental Protection Commission.

Project Engineer, Stormwater Remediation and Master Planning - Corporex Development, Tampa, FL. Conducted stormwater remediation and master planning for Presidents Plaza, an 18-acre site on Eisenhower Boulevard.

Project Engineer, Stormwater Design and Remediation - Corporex Development, Tampa, FL. Performed stormwater design, remediation, and master planning for 104-acre site at Interstate 4 and Buffalo Avenue (Corporex Industrial Park).

Project Engineer, Main Outlet Sanitary Sewer Rehabilitation Project - Tampa, FL. Performed design permitting and construction phase services. Project details involved relining of 48-inch and 54-inch RCP sewers with fiberglass line pipe, or with the *in situ* form process, and rehabilitation of existing manholes and sewer structures including restoration and appurtenant work. Construction cost exceeded $2 million.

Project Engineer, Broadway Interceptor Sanitary Sewer Rehabilitation Project - Tampa, FL. Performed design, permitting, and construction phase services. Rehabilitated approximately 8,930 linear feet of existing 24-inch through 48-inch reinforced concrete pipe interceptor sewer by relining the pipe with polyethylene or fiberglass liner, or by the *in situ* form process. Renovated approximately 35 manholes, junction chambers, and appurtenant structures. Construction costs were approximately $2 million.

Project Manager/Utilities Coordinator, Lithia-Pinecrest Waterline Relocation Project - Hillsborough County, FL. Relocated approximately 5 miles of 36-inch diameter water transmission main along Lithia Pinecrest Road. Relocation involved subaqueous crossing of the Alafia River. Coordinated utilities with other utilities present in the proposed right-of-way. Design package included special conflict manholes and junction boxes.

Project Manager/Utilities Coordinator, US 41 Corridor and Utilities Study - Florida DOT, Barton, FL. Conducted Corridor Study and Utilities Relocation Study for a 30-mile segment of US Highway 41 with an estimated construction cost of $30 million. Unique design requirements included recommendations for right-of-way acquisition, as well as aerial and subaqueous utilities crossings for water, sewer, telephone, electric, and TV cable utilities. The project lasted 4 years with completion in 1986.

Project Engineer, North Parsons Interceptor Sewer - Hillsborough County, FL. Project design included approximately 2,500 linear feet of 18-inch and 1,950 linear feet of 24-inch sanitary gravity interceptor sewer. Special considerations included utility coordination, existing and future proposed line connection accommodation, and cathodic protection. Estimated construction cost was $510,000.

Project Engineer, 20-Inch Force Main Design Along Faulkenburg Road from SR 60 to Woodberry - Hillsborough County, FL. Project design involved approximately 4,000 linear feet of 20-inch sanitary sewer force main along Faulkenburg Road. Special considerations included utility coordination, FDOT and CSXT Railroad permitting and polyethylene cathodic protection. Project construction cost was approximately $350,000.

Project Engineer, North Parsons Pump Station and Force Main - Hillsborough County, FL. Designed a new wastewater pump station with a capacity of 5.0 mgd to replace the existing North Parsons Pump Station. Force Main design included approximately 2,800 Hillsborough County right-of-way use permits and cathodic protection. The estimated construction cost was $330,000.

Project Engineer, Closure of Landfill No. 13 at Ft. Benning, GA - USACE/Kansas City District, Kansas City, MO. Completed project in accordance with the State of Georgia EPD and USACE standards. Project deliverables included: RCRA Facility Investigation Phases I and II determining pollutant release extent; Corrective Measures Study evaluating closure options and selecting the optimum alternatives based on reliability, performance, constructability, and cost; and preparing 35%, 65%, 95%, and 100% closure documents which included plans, specifications, permits, and construction cost estimates. Project was completed in February 1991.

Landfill Operations Study and Closure Plan Review -Bee Ridge Landfill, Sarasota County, FL. Conducted independent study and analysis of landfill operations. Reviewed proposed closure plans for the Preserve at Misty Creek (an adjacent landowner). Analysis and summary memorandum included specific conditions/recommendations for FDER permit issuance and a long-term plan ensuring closure compliance with current laws and regulations in the State of Florida.

Project Engineer, Solid Waste Storage, Use, and Disposal Options Study for 13 Industrial Locations Coast to Coast - Anaconda Industries (a wholly owned subsidiary of ARCO). Performed site investigation and completed reports on 13 industrial sites for storage, use, and disposal of hazardous and solid waste. Study included cooperative efforts between plants to share shipment/disposal services. Minimized quantity generation by recycle and reuse methods.

ADDITIONAL PROJECT EXPERIENCE

- Industrial Water Treatment Plant for Hudson Valley Apple Products in Milton, New York.
- Reservoir Design, Water Treatment Plant Design including special design considerations for taste and odor control and main water distribution line design for East Syracuse, New York.
- Water Treatment Plant addition and plant process modifications to Cornwall-on-Hudson WTP, NY.
- Water Treatment Plant Design Evaluation and recommendations for the 20 GD Morris Bridge Water Treatment Plant for the City of Tampa, Florida.
- Water Treatment Plant Design for the Marion County School Board including Marion-Levy Bi-County High School and Belleview-Santos elementary School.
- US 301 36-inch water line design for Hillsborough County Utilities Department, Florida.
- Washington-Miller-Lumsden 12-inch Water Transmission Main 15,000 linear feet of 12-inch transmission main along Washington, Miller, and Lumsden Roads for the Hillsborough County Utilities Department, Hillsborough County, Florida.
- Parsons Avenue Water Transmission Main 35,000 linear feet of 20-inch water transmission main along Parsons Avenue for Hillsborough County Utilities Department, Hillsborough County, Florida.
- 36-inch subaqueous crossing of the Alafia River at Lithia Pinecrest Road for Hillsborough County Utilities Department, Hillsborough County, Florida.
- 48-inch aerial water main crossing of Brooker Creek and Lake Tarpon Outfall Canal (refurbishment of existing crossing including subaqueous structural) inspection for the Pinellas County Water Authority, Pinellas County, Florida.
- 60-inch aerial water main crossing of Lake Tarpon Outfall Canal (refurbishment of existing crossing including subaqueous structural inspection) for the Pinellas County Water Authority, Florida.
- Refurbishment of 22 individual aerial water main crossings ranging in size from 8 inches to 24 inches in diameter. Project included preparation of repair documents for the Pinellas County Water Authority, Pinellas County, Florida.

RFP Requirements: Civil Engineer	*Mr. Scott's Qualifications: Civil Engineer*
• Bachelors Degree in Civil Engineering	• M.S., Civil Engineering, 1971

ANDREW L. BRYSON, JR.
CERTIFIED INDUSTRIAL HYGIENIST
PROGRAM SAFETY & TRAINING

CITIZENSHIP	USA
CERTIFIED INDUSTRIAL HYGIENIST	1993
MASTER OF PUBLIC HEALTH, OCCUPATIONAL & ENVIRONMENTAL HEALTH & SAFETY	1991

EDUCATION/TRAINING

- Certified Industrial Hygienist, American Board of Industrial Hygiene (1993)
- OSHA 40 Hour Hazardous Waste Operations, Emergency Response Course and Annual Refresher (1991/92/93/94/95/96)
- OSHA 8 Hour Hazardous Waste and Emergency Response Supervisor Course (1991)
- First Aid/CPR with Annual CPR Refresher (1993/94/95)
- Master of Public Health, Occupational & Environmental Health and Safety, University of Tennessee (1991)
- NIOSH Sampling and Evaluating Airborne Asbestos Dust (1991)
- Supervision of Asbestos Abatement Projects (1989/90)
- Inspection of Buildings and Asbestos-Containing Materials (1990)
- Bachelor of Arts, Organismal and Systems Biology, University of Tennessee (1983)

EXPERIENCE SUMMARY

He developed a generic SSHP for CWM-contaminated sites for use by all (USACE) contractors investigating and remediating wastes at known or potential CWM sites.

A Certified Industrial Hygienist, Mr. Bryson has over seven years of experience in the multi-disciplinary field of Occupational Safety and Health. Mr. Bryson currently serves as the Occupational Safety and Health Manager for EOD Technology, Inc. where he develops and implements EODT's Corporate safety and health policies, procedures and programs. Mr. Bryson maintains, updates and implements the EODT Corporate Safety and Health Program (CSHP); develops and presents OSHA required safety, health, hazardous waste and emergency response training courses and provides occupational safety and health consultation to EODT management and on-site personnel who investigate and remediate sites contaminated with hazardous, toxic, and radiological waste (HTRW), unexploded ordnance (UXO), ordnance and explosive waste (OEW) and Chemical Warfare Material (CWM). Mr. Bryson has considerable experience researching and developing Site Safety and Health Plans (SSHPs) for HTRW, OEW and CWM sites. Conducts on-site occupational safety and health audits to ensure EODT's continued compliance with applicable Federal, state, and local safety and health regulations. His qualifications also include a thorough knowledge of the safety and health requirements mandated by OSHA, ANSI, EPA, DOE, and US Army standards and regulations.

Through his current and previous employment, Mr. Bryson has gained extensive experience providing industrial hygiene and industrial safety consultation and management services. This experience includes:

- Developing and presenting OSHA required training programs;
- Conducting site and facility assessments involving the anticipation, recognition, evaluation, and control of process and work place safety and health hazards; and
- Utilizing direct-reading real-time instruments and integrated sampling to assess personnel exposed to chemical and physical hazards.

PROFESSIONAL EXPERIENCE

Assistant Safety and Health Manager - UXO/OEW/CWM Project - Former American University, Washington D.C.

- Provided health and safety consultation to the Site Safety and Health Officer and project management personnel, and acted as the EODT liaison with the Corps of Engineers, Huntsville Division health and safety staff.
- Integral in developing the project Safety, Health and Emergency Response Plan (SHERP).
- Developed and presented site-specific training related to hazards associated with CWM, HTRW and operational hazards.
- Conducted periodic audits of the site facilities and operations and ensured the safe and healthful conduct of site operations and EODT's continued compliance with OSHA, USACE, and Army regulations.
- Identified and successfully applied cost effective, commercially available, real-time monitoring instruments capable of detecting various chemical warfare agents at levels significantly lower than instruments being used by the military at that time.

Assistant Safety and Health Manager - Area 5 Former Raritan Arsenal, NJ

This site was a confirmed CWM burial and disposal site where EODT characterized and determined the type and extent of CWM contamination. Mr. Bryson:

- Developed the site SHERP, which involved the integration and use of both government-provided and commercially available CWM monitoring to allow for the safe detection of CWM in both the work area and at the site perimeter.
- Provided safety and health consultation and periodic on-site support to the SSHO, and maintained frequent communication with the USACE safety and health staff personnel.

Occupational Safety and Health Manager - Title I and II Services, Southeastern U.S.

This project involved the assessment, investigation and remediation of UXO/OEW contamination at over 17 sites throughout the Southeastern United States and Puerto Rico. While UXO/OEW has been the primary contaminant on these sites, several of the sites have been identified by the USACE as being potential CWM sites as well. Developed the SSHPs for each site. Through site inspections and frequent communication with the SSHOs, Mr. Bryson implemented EODT, OSHA and USACE safety and health requirements during site operations.

Occupational Safety and Health Manager - Drum and Cylinder Sampling, Elmendorf AFB, Anchorage, AK

This project presented significant operational challenges. Drum and cylinder sampling involved collecting

samples from 55-gallon steel drums, and five unlabeled high pressure gas cylinders. X-ray and physical examination of the drums revealed concrete-encapsulated storage containers inside the drums. Drums had a piece of plywood imbedded in the concrete labelled "DANGER CYANIDE". Mr. Bryson developed the SSHP and Site Sampling and Monitoring Plan involving the selection of work practice controls and personal protective equipment (PPE) to ensure the health and safety of both on- and off-site personnel.

Demonstration Project for Debris Separation, Open Burn Areas, Savanna Army Depot

EODT, under subcontract to an engineering firm, had a significant role in the performance of this demonstration project for the USACE Nashville District. This project's goal was to gain information to aid in the future remedial designs of other similarly contaminated sites.

- Used advanced sifting technology to remove UXO/OEW debris from over 15,700 cubic yards of soil contaminated with heavy metals and organic contaminants, with the potential for encountering CWM. EODT site personnel performed extensive site clearing, then constructed support facilities and an environmental enclosure for the sifting operations.
- EODT personnel also conducted the set-up and testing of the sifters, and conducted excavation and sifting operations.
- Developed the project SSHP, which involved the design and assignment of the engineering controls, work practice controls, PPE, real-time monitoring and integrated sampling which resulted in the successful protection of site personnel from the numerous site safety and health hazards.
- Provided consultation and trouble-shooting to the EODT SSO and ensured implementation of all relevant safety and health regulations.

MICHAEL E. SHORT
QC MANAGER

CITIZENSHIP	**USA**
GRADUATED FROM INDIAN HEAD	**July 25, 1968**
MILITARY EOD EXPERIENCE	**6 YEARS**
COMMERCIAL UXO EXPERIENCE	**6 YEARS**
RELATED EXPLOSIVE EXPERIENCE	**30 YEARS**

EDUCATION/TRAINING

- OSHA 8 Hour Refresher Hazardous Waste Site Workers Course (1992/93/94/95/96)
- OSHA 40 Hour Hazardous Waste Site Workers Course (1991)
- First Aid/CPR with Annual CPR Refresher (1991/92/93/94)
- OSHA 8 Hour Hazardous Site Workers Supervisors Course (1991)
- European Explosive Safety Course, Rouen, France (1989)
- Explosive Plant Operations School, IRECO, Salt Lake City, Utah (1979)
- Du Pont Explosive Safety School, Atlantic City, New Jersey (1978)
- QA/QC School, Milliken & Company, Spartanburg, South Carolina (1977)
- B.A., Business Management, Golden Gate University, San Francisco, California (1976)
- Ammunition Officers Course, Aberdeen Proving Ground, Maryland (1970)
- Army EOD Chemical/Biological Warfare School Ft. McClellan, Al (1967)
- Basic and Advanced Naval EOD School, Indian Head, Maryland (1967/68)
- Demolition School, Ft. Leonard Wood, Missouri (1965)

MILITARY EOD/CIVILIAN UXO ASSIGNMENTS

06/65-08/66	Company Commander and Ammo Depot Operations Officer - 821st Ordnance Company - US Army - Vietnam.
09/67-07/68	Student and Instructor - U.S. Army Detachment, Naval EOD School, Indian Head, Maryland.
07/68-09/71	Detachment Commander - 51st EOD - Fort Sheridan, Illinois.
08/72-08/74	Advisor Thai - EOD and Ordnance Units - JUSMAG, Thailand. Ordnance, infantry, and EODT advisor.

06/87-12/89	Instructor, EIC Course, Oklahoma City, Oklahoma and Baton Rouge, Louisiana. Target foreign nationals to recognize, make and render safe improvised explosive device.
04/91-09/91	Site Safety and Health Officer - EODT - Knoxville, TN. 250,000 distressed explosive disposal and Former Camp Wheeler

10/91-01/92 Corporate Safety, QA/QC and Training Manager - EODT - Knoxville, TN. Developed corporate safety, Training and QC Program.

01/92-Present Program & Project Manager - EODT - Knoxville, TN. Managed over 30 projects ranging from 2 men for one week to 30 technicians for a year.

05/93-09/94 Director of Engineering Services - EODT - Knoxville, TN. Responsible for all safety training and quality control to include the company equipment and library.

10/94-Present Director of Operations - EODT - Knoxville, TN. Responsible for all field operations.

11/95-Present Vice President - EODT - Knoxville, TN. Responsible for safety, training quality and operations.

PROFESSIONAL AFFILIATIONS

- International Association of Bomb Technicians and Investigators (IABTI) (1972 - Present)
- Society of Explosive Engineers (SEE) (1978 - Present)
- Society of Mining Engineers (SME) (1987 - Present)
- Tactical Response Association, International (1989 - Present)
- Texas Tactical Officers Association (1989 - Present)

Arsenal, Edison, NJ. Roy F. Weston's US Army Corps of Engineers Environmental Program.

03/95-05/95 Sr. UXO Supervisor/Project Manager - EODT - Camp Green, Charlotte, NC. Environmental Science and Engineering EE/CA Program for CEHNC. Supervised and managed on EE/CA study for this state park which is located on a mountainside.

05/95-09/95 Senior UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ - ICF Kaiser. Supervised and managed soil sampling and well installations, UXO and OEW identification and avoidance.

11/95-12/95 Senior UXO Supervisor/Project Manager - EODT - Barry M. Goldwater Bombing Range, Gila Bend, AZ. Dame & Moore AFCEE Program. Supervised and managed this OB/OD closure project which included sifting of soil using a shaker.

03/96-04/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ. ICF Kaiser. Supervised and managed soils sampling and monitoring well installation, UXO. OEW identification and avoidance.

04/96-07/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Former Raritan Arsenal, Edison, NJ. Roy F. Weston. Supervised and managed well installation, trench excavation, brush removal and UXO/OEW identification and avoidance.

08/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ. ICF Kaiser. Waterborne UXO identification and avoidance in the taking of lake bottom soil samples.

10/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - TCAAP, New Brighton, MN. QA of OB/OD area to include a ferrous and non-ferrous geophysical survey and intrusive investigation.

11/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Ft. Knox, KY. SAIC. Surveying in grids and conducting an EM-31 survey to identify burial pits. Surface clearance of OEW/UXO.

11/96 Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ. ICF Kaiser. UXO/OEW identification and avoidance in support of soil sampling and well installation.

03/97 Sr UXO Supervisor - EODT - Ft. Knox, KY. Conducting UXO Survey utilizing EM-31.

SALVATORE A. MOLLE
SENIOR UXO SUPERVISOR

CITIZENSHIP	**USA**
GRADUATED FROM INDIAN HEAD	**October 17, 1975**
MILITARY EOD EXPERIENCE	**13.83 YEARS/USN**
COMMERCIAL UXO EXPERIENCE	**2.25 YEARS**

EDUCATION/TRAINING

- US Naval Explosive Ordnance School, Indian Head, MD (1975)
- Navy Underwater Swimmer School, Key West, Florida (1975)
- OSHA 40 Hour Hazardous Waste Site Workers Course (1993)
- OSHA 8 Hour Refresher Training Course (1994/95/96/97)

MILITARY EOD/CIVILIAN UXO ASSIGNMENTS

12/75-08/80	EOD Demo Range Officer - EOD Unit ONE - Barbers Point, Hawaii. OIC - Shipboard EOD teams. Demo OPS in Hawaii, Philippines, and Thailand.
08/80-08/82	EOD OIC Det - Subic Bay, Republic of Philippines. AOIC of Det. Com US Navy Philippines. Live fire range safety and EOD officer.
08/82-12/84	OIC Det. Brunswick - EOD Group TWO - NAS Brunswick. NAS demo range officer.
12/84-07/87	EOD Detachment - West Pac - Subic Bay, Republic of Philippines. AOIC of Det. Com US Navy Philippines. Live fire range safety and EOD officer.
07/87-01/88	EOD Mobile Unit 5 - Subic Bay, Republic of Philippines. AOIC of Det. Com US Navy Philippines. Live fire range safety and EOD officer.
01/88-08/89	Demo Range Officer - EOD School - Indian Head, Maryland. Demo range officer for NAVSCOL EOD.
04/92-03/93	Team Member - EOD WSI - Kuwait. Performed disposal operations throughout Kuwait. QA member - 80 Indians, 4 EOD walking sweeps of sub-sectors.
06/93-06/93	UXO Specialist - EODT - Former Raritan Arsenal, Edison, NJ. EODT's US Army Corps of Engineers Huntsville Division's OEW Remediation East of the Mississippi Program.
04/94-04/94	UXO Specialist - EODT - Former Raritan Arsenal, Edison, NJ. EODT's US Army Corps of Engineers Huntsville Division's OEW Remediation East of the Mississippi Program.
06/94-06/94	Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Former Raritan Arsenal, Edison, NJ. Roy F. Weston's US Army Corps of Engineers Environmental Program.

03/95-05/95	Sr. UXO Supervisor/Project Manager - EODT - Camp Green, Charlotte, NC. Environmental Science and Engineering EE/CA Program for CEHNC. Supervised and managed on EE/CA study for this state park which is located on a mountainside.
05/95-09/95	Senior UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ - ICF Kaiser. Supervised and managed soil sampling and well installations, UXO and OEW identification and avoidance.
11/95-12/95	Senior UXO Supervisor/Project Manager - EODT - Barry M. Goldwater Bombing Range, Gila Bend, AZ. Dame & Moore AFCEE Program. Supervised and managed this OB/OD closure project which included sifting of soil using a shaker.
03/96-04/96	Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ. ICF Kaiser. Supervised and managed soils sampling and monitoring well installation, UXO. OEW identification and avoidance.
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10/96	Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - TCAAP, New Brighton, MN. QA of OB/OD area to include a ferrous and non-ferrous geophysical survey and intrusive investigation.
11/96	Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Ft. Knox, KY. SAIC. Surveying in grids and conducting an EM-31 survey to identify burial pits. Surface clearance of OEW/UXO.
11/96	Sr. UXO Supervisor/Project Manager/UXO Site Manager - EODT - Picatinny Arsenal, Dover, NJ. ICF Kaiser. UXO/OEW identification and avoidance in support of soil sampling and well installation.
03/97	Sr UXO Supervisor - EODT - Ft. Knox, KY. Conducting UXO Survey utilizing EM-31.

APPENDIX G

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

STANDARD OPERATING PROCEDURES

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

TABLE OF CONTENTS

Revised February 16, 1996

U.S. Army Engineering and Support Center, Huntsville
SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR UNEXPLODED ORDNANCE (UXO) OPERATIONS

1. Introduction. There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision. Only those personnel absolutely essential to the operation shall be allowed in the restricted/exclusion area during UXO operations (DoD 6055.9-STD). Safety must become a firmly established habit when working with UXO. Safety is the leading edge of quality.

2. References. The following documents form a part of this document to the extent referenced.

ATFP 5400.7	Alcohol Tobacco and Firearms Explosives Laws and Regulations
27 CFR Part 55	Commerce in Explosives
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 100-199	Transportation
DoD 6055.9-STD	DoD Ammunition and Explosives Safety Standards
DA Pam 385-64	Ammunition and Explosives Safety Standards
ETL 385-1-2	Generic Scope of Work for Ordnance Avoidance Activities
TM 9-1300-200	Ammunition General
TM 9-1300-214	Military Explosives
TM 9-1375-213-12	Operator's and Organization Maintenance Manual (Including Repair Parts and Special Tools List); Demolition Materials

3. Definitions

a. Unexploded Ordnance (UXO). An item of ordnance which has failed to function as designed, or has been abandoned or discarded, and is still capable of functioning and causing injury to personnel or damage to material.

b. UXO Procedures. UXO procedures include but are not limited to the following actions:

(1) Gaining access to (manual excavation) and identifying subsurface anomalies, and assessing condition of buried UXO.

(2) Identifying and assessing condition of surface UXO.

(3) Recovery and final disposal of all UXO.

c. UXO Related procedures: UXO related procedures include but are not limited to the following:

(1) Location and marking of subsurface anomalies.

(2) Location and marking of suspected surface UXO.

(3) Transportation and storage of recovered UXO.

(4) Utilizing Earth Moving Machinery (EMM) to excavate soil to no closer than approximately 12 inches of a subsurface anomaly.

d. UXO Qualified Personnel: UXO qualified personnel are US citizens who have graduated from the US Army Bomb Disposal School, Aberdeen, MD, or the US Naval Explosive Ordnance Disposal (EOD) School, Indian Head, MD. Graduates of the EOD assistant Course, Redstone Arsenal, AL, or Elign AFB, FL with more than three years combined active duty military EOD and contractor UXO experience shall also be UXO qualified.

4. General Safety Concerns.

a. UXO operations shall not be conducted until a complete plan for the operation involved is prepared and approved. Plans shall be based upon limiting exposure to a minimum number of personnel, for a minimum time, to the minimum amount of UXO, consistent with safe and efficient operations.

b. Only UXO qualified personnel shall be involved in UXO procedures. Non-UXO qualified personnel may be utilized to perform UXO related procedures when supervised by UXO qualified personnel. All personnel engaged in operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures.

c. The use of electroexplosive devices (EED) susceptible to electromagnetic radiation (EMR) devices in the radio frequency (RF) range, that is, radio, radar, and television transmitters, has become almost universal.

d. Some ordnance is particularly susceptible to EMR (RF) emission.. A knowledge of ordnance that is normally unsafe in the presence of EMR (RF) is important so preventive steps can be taken if the ordnance is encountered in a suspected EMR (RF) field.

(2) The presence of antennas, communication and RADAR devices should be NOTED on initial site visits and/or preliminary assessments.

(3) When potential EMR hazards exist, the site shall be electronically surveyed for EMR/RF emissions and the appropriate actions will be taken. Minimum safe distances from EMR/RF sources are listed in Tables 2-2, 2-3, and 2-4 of TM 9-1375-213-12.

f. Do not wear outer or undergarments made of materials which have high static generating characteristics when working on UXOs. Materials of 100 percent polyester, nylon, silk, or wool are highly static-producing. Any person handling a UXO suspected of containing EEDs will ground himself/herself prior to touching the UXO. Refer to DA Pam 385-64 for more information regarding non-static producing attire.

5. UXO Safety Precautions for Site Characterization.

a. Make every effort to identify the UXO. Visually examine the item for markings and other identifying features such as shape, size, and external fittings. However, do not move the item to inspect it. If an unknown UXO is encountered, the US Army Engineering and Support Center, Huntsville (USAESCH) representative will be notified.

b. Foreign UXO were returned to the United States for exploitation and disposal. When a records search indicates the possibility of foreign UXO being on a site, appropriate safety precautions and procedures will be incorporated into UXO operation plans.

c. Any time a suspected chemical munition is encountered, all personnel will

withdraw up wind from the munition. A two person UXO team, located upwind, shall secure the munition until relieved by the Technical Escort Unit (TEU) or Explosive Ordnance Disposal (EOD) personnel.

d. Ordnance items which penetrate the earth to a depth where the force of the explosion is not enough to rupture the earth's surface forms an underground cavity called a camouflet. Camouflets will be filled with the end product of the explosion, carbon monoxide gas. Camouflet detection and precautions must be considered if a records search indicates the site was used as an impact area.

e. Avoid inhalation of, and skin contact with, smoke, fumes, and vapors of explosives and related hazardous materials.

f. Consider UXO which has been exposed to fire and detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents which render it much more sensitive than it was in its original state.

g. Do not rely on the color coding of UXO for positive identification of contents. Munitions having incomplete, or improper color coding have been encountered.

h. Avoid the area forward of the nose of a munition until it can be ascertained the item does not contain a shaped charge. The explosive jet can be fatal at great distances forward of the longitudinal axis of the item. Assume any shaped charge munitions to contain a piezoelectric (PZ) fuzing system until the fuzing system is positively identified. A PZ fuze is extremely sensitive, can function at the slightest physical change, and may remain hazardous for an indefinite period of time.

i. Examine a projectile for the presence or absence of an unfired tracer. Also examine the item for the presence or absence of a rotating band and it's condition.

j. Approach an unfired rocket motor from the side. Ignition will create a missile hazard and hot exhaust.

(1) Do not expose rocket motors to any EMR source.

(2) If an unfired rocket motor must be transported, it shall be positioned in the direction which offers the least exposure to personnel in the event of an accidental ignition.

k. Consider an emplaced landmine armed until proven otherwise. It may not be possible to tell, or it may be intentionally rigged to deceive.

(1) Many training mines contain firing indicator charges capable of inflicting serious

injury.

(2) Exercise care with wooden mines that have been buried for a long time. Because of soil conditions, the wood deteriorates and the slightest inadvertent pressure/movement may initiate the fuze.

l. Assume a practice UXO contains a live charge until it can be determined otherwise. Expended pyrotechnic/practice devices may contain red/white phosphorus residue. Due to incomplete combustion, phosphorous may be present and reignite spontaneously if subjected to friction or the crust is broken and the contents exposed to air."

m. Do not approach a smoking white phosphorus (WP) UXO. Burning WP may detonate the burster or dispersal explosive charge at any time.

n. If the positive identification of suspected explosive materials is required, procedures in Chapter 13, TM 9-1300-214, " Military Explosives" or other approved explosives analysis shall be used to identify the explosives.

6. Ordnance Avoidance for HTRW Activities.

a. Investigative activities on potential ordnance contaminated sites will be accomplished using approved ordnance avoidance procedures.

b. HTRW ordnance avoidance procedures are detailed in Engineering Technical Letter 385-1-2. This ETL is available on the Internet, or through the Quality and Technology team at USAESCH.

7. Restricted/Exclusion Area Operations.

a. On Ordnance and Explosives sites, the contractor's site safety personnel shall establish a restricted/exclusion area for each UXO team operating on the site. The purpose of the area is for the protection of the public and other personnel from the blast and fragmentation hazards of an accidental detonation. The area shall be establish based on the following minimum factors:

(1) Previous site use that caused the contamination: impact area, open burn/ open detonation, burial, etc..

(2) Project type: surface clearance, subsurface clearance, sifting operation, sampling, etc..

(3) Known ordnance contamination, distances to public exposure, terrain, etc..

b. When multiple UXO teams are operating on a site, the restricted/exclusion area and team separation distances shall never be less than 200 feet.

c. During the time frame that UXO operations are being accomplished, only personnel necessary for the UXO operation shall be within the restricted/exclusion area. When non-essential personnel enter the restricted/exclusion area, all UXO operations will cease.

(1) Plan for, provide, and know the measures to be taken in the event of an accident.

(2) Provide a designated emergency vehicle in the area in case of an accident or other emergency.

(3) Coordination with the appropriate airspace representative shall be conducted and the appropriate notification procedures arranged.

(4) When non-essential personnel must enter the restricted/exclusion area, the following must be accomplished: a) The individual must receive a safety briefing, b) be escorted by a UXO qualified individual; and c) All UXO operations must cease within the fragmentation radius of the largest item expected to be encountered within the area.

d. Before any movement of a UXO, the fuze condition must be ascertained. If the condition is questionable, consider the fuze to be armed. The fuze is considered the most hazardous component of a UXO, regardless of type or condition.

(1) In general, a projectile containing a Base Detonating (BD) fuze is to be considered armed if the projectile has been fired.

(2) Arming wires and pop out pins on unarmed fuzes should be secured by taping in place prior to movement.

(3) Do Not dismantle or strip any UXO.

(4) Do Not depress plungers, turn vanes, or rotate spindle, levers, setting rings, or other external fittings on UXO's. Such actions may arm, actuate, or function the UXO.

(5) Do Not subject mechanical time fuzes to any unnecessary movement.

(6) Do Not remove any fuzes from UXO's.

(7) Some ordnance items do not contain any positive safety features. Positively identify and review all safety precautions prior to handling any ordnance.

e. Personnel working within the Restricted area/Exclusion zone shall comply with the following:

(1) Do not conduct operations without an approved Site Specific Safety and Health Plan and an approved Work Plan.

(2) Do not smoke, except in authorized areas.

(3) Do not have fires for heating or cooking, except in authorized areas.

(4) Do not conduct explosive operations during electrical, sand, dust, or snow storms.

(5) Explosive operations will be conducted during daylight only.

(6) During magnetometer operations, UXO teams shall not wear safety shoes or other footwear which would cause the magnetometer to present a false indication.

f. Do not undertake the handling or disposal of liquid propellant fuels or oxidizers if not familiar with the characteristics of the material.

g. Civil War projectiles shall be treated as any other UXO.

h. If records search indicated WP munitions were fired or destroyed in the area, extra care shall be taken when uncovering a buried UXO, A buried WP munition may be damaged and when exposed to air, may start burning and detonate. An ample supply of water and mud shall be immediately available if excavation reveals a WP UXO. Appropriate protective equipment (leather gloves, face shield, and flame-retardant clothing) and first aid shall also be immediately available.

8. Storage.

a. During Ordnance and Explosives projects, storage of explosives and UXO fall into two categories.

(1) On-DoD Installations.

(2) Off-DoD Installations.

b. On-DoD Installation Storage.

(1) The provisions of DoD 6055.9-STD shall be followed. Generally, an installation should have an explosive storage area that meets requirements in DoD 6055.9-STD.

Permitting and compliance requirements for existing facilities are an installation responsibility. Compatibility of explosives found in Chapter 3, DoD 6055.9 -STD shall be complied with. UXO awaiting disposal shall not be stored with other explosives.

(2) If an installation does not have an existing storage facility, the provisions of paragraph c. below shall apply.

c. Off-DoD Installation Storage.

(1) Generally, the contractor is responsible for construction of a temporary explosive storage area that meets all local, state, ATF requirements, and as much of DoD 6055.9-STD that is practical to implement.

(2) When establishing an explosive storage area, the following requirements must be met.

(a) The area shall, if possible, meet the inhabited building and public traffic route distances specified in DoD 6055.9-STD. If the distances are less than required by DoD 6055.9-STD, then a proposed barricading and berm plan to protect the public from accidental detonation must be submitted and approved.

(b) Magazines must meet requirements of ATF Regulations, and each magazine must have an Net Explosive Weight established for the explosives to be stored.

(c) Each magazine must have lightning protection IAW Chapter 7, DoD 6055.9-STD.

(d) Magazines must meet intramagazine distances as defined in Chapter 9, DoD 6055.9-STD.

(e) A physical security survey shall be conducted to determine if fencing or guards are required. Generally, a fence around the magazines is needed, but the contractor is responsible to determine the degree of protection required to prevent the theft of explosives and UXO.

d. A fire plan for the storage area shall be prepared and coordination with the nearby fire department shall be conducted. Placarding of magazines shall be in accordance with local, state, and federal requirements.

9. Excavation Operations.

a. The usual method for uncovering buried UXO is to excavate by hand. Hand excavation is the most reliable method for uncovering UXO, but unless the UXO is very

near the surface, hand excavation exposes more people to the hazard of detonation for a longer period of time than any other method. Hand excavation will be accomplished only by UXO qualified personnel.

b. Earth moving machinery (EMM) may be used to excavate buried UXO, if the UXO is estimated to be deeper than 12 inches. EMM shall not be used to excavate within 12 inches of an UXO. When excavation gets within approximately 12 inches of an UXO, hand excavation shall be used to uncover the UXO. EMM may be operated by non-UXO personnel, under the direct supervision of UXO personnel.

(1) If more than one EMM will be used on the same site, they will be separated by the same separation distances required for multiple teams on that site.

(2) During excavation operations, only those personnel absolutely necessary for the operation shall be within the restricted area/exclusion zone.

(3) Excavation and trenching shall comply with the provisions of 29 CFR 1926 subpart P.

10. Disposal Operations.

a. As a general rule, UXO will be detonated in place when the situation allows. All detonation-in-place operations shall be conducted by electrical means to assure maximum control of the site, except in situations where static electricity or EMR hazards are present. Non-electrical means can be used when the situation dictates.

(1) Do not allow one person to work alone in disposal operations. At least one person shall be available near the disposal site to give warning and assist in rescue activities in the event of an accident.

(2) Loose initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. These explosives manifest extreme sensitivity to friction, heat, and impact. Extra precautions may be required when handling these types of explosives. Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation, the sensitivity of these explosives is greatly increased when dry.

(3) Only condition "Code A" or "Code C" explosive items shall be used as donor explosives for disposal operations.

(4) Exercise extreme care in handling and preparing high explosives for detonation. They are subject to detonation by heat, shock, and friction.

(5) Do not pack bomb fuze wells with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.

(6) Photo flash bombs must be handled with the same care as black powder filled munitions.

(7) WP UXO shall not be detonated into the ground. The UXO shall be counter-charged on the bottom center line when possible.

b. The following safety rules will be adhered to at all times:

(1) Carry blasting caps in approved containers and keep them out of the direct rays of the sun, and located at least 25 feet from other explosives, until they are needed for priming.

(2) Do not handle, use, or remain near explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

(3) Do not use explosives or accessory equipment that is obviously deteriorated or damaged. They may cause a premature detonation or fail completely.

(4) Always point the explosive end of a blasting cap, detonators, and explosive devices away from the body during handling.

(5) Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap.

(6) Use electric blasting caps of the same manufacture for each demolition shot involving more than one cap.

(7) Do not bury blasting caps. Use detonating cord to position blasting caps above the ground. Buried blasting caps are subject to unobserved pressures and movement which could lead to premature firing or misfires.

(8) Test electric blasting caps for continuity at least 25 feet from any other explosives prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to be connected to the firing circuit.

c. When disposing of explosives by detonation, do not approach the disposal site for at least thirty minutes, after the expected detonation time, in the event of a misfire.

When conducting non-electric procedures, the wait time shall be thirty minutes plus time fuse burn time.

d. A post-search of the detonation site shall be conducted to assure a complete disposal was accomplished.

e. If the situation dictates, protective measures to reduce shock, blast, and fragmentation shall be taken. Army Technical Manual (TM) 5-855-1, Fundamentals of Protective Design for Conventional Weapons, contains data on blast effects, ground shock, cratering, ejection, and fragmentation. The following distances shall be used unless protective measures are implemented.

(1) For non-fragmenting explosive materials, evacuation distance should be a minimum of 1250 feet.

(2) For fragmenting explosive materials, evacuation distance should be a minimum of 2500 feet. For bombs and projectiles with caliber 5-inch or greater, use a minimum evacuation distance of 4000 feet.

(3) Items with lugs, strong backs, tail plate sections, etc., should be oriented away from personnel locations as these items tend to travel further than normal fragmentation.

f. Consideration should be given to tamping the UXO to control fragments, if the situation warrants. Fragments shall be minimized not only to protect personnel but also property, such as buildings, trees, etc.

g. Open burning of explosives and smokeless powder or chemical decomposition of explosives shall not be accomplished without prior approval of the contracting officer.

(1) Do not inhale the smoke or fumes of burning pyrotechnic or incendiary materials. The fumes and dust from many of these materials are irritating and/or toxic if inhaled.

(2) Do not use water on incendiary fires. Water may induce a violent reaction or be completely ineffective, depending on the mixture.

(3) Anticipate a high order detonation when burning pyrotechnics or incendiary-loaded UXO. Safety measures for personnel and property must be based upon this possibility.

h. Inert Ordnance will not be disposed of or sold for scrap until the internal fillers

have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture, or air to expand and burst the sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to confined pressure.

11. Transportation.

a. If UXO must be transported off-site for disposal , the provisions of 49 CFR 100-199, DA Pam 385-64, state and local laws shall be followed.

b. Armed fuzes will only be transported when absolutely necessary and when all other avenues of "in place" disposal have been exhausted. Transportation to an on-site disposal area for these items is preferred.

c. Do not transport WP munitions unless it is immersed in water, mud, or wet sand.

d. If loose pyrotechnic, tracer, flare, and similar mixtures are to be transported, they shall be placed in #10 mineral oil or equivalent to minimize fire and explosion hazards.

e. Incendiary loaded munitions should be placed on a bed of sand and covered with sand to help control the burn if a fire should start.

f. If an unfired rocket motor must be transported, it shall be positioned in such a manner as to offer the maximum protection to personnel in the event of an accident.

g. If base-ejection type projectiles must be transported to a disposal area or collection point, the base will be oriented to the rear of the vehicle and the projectile secured, in the event the ejection charge functions in route.

h. If an UXO, with exposed hazardous filler (HE, etc), has to be moved to a disposal area, the item shall be placed in an appropriate container with packing materials to prevent migration of the hazardous filler. Padding should also be added to protect the exposed filler from heat, shock, and friction.

STANDARD OPERATING PROCEDURE 101

BIOLOGICAL HAZARDS

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the exposure to biological hazards.

2.0 SCOPE

This SOP applies to all site personnel; including contractor and subcontractor personnel, and operations where exposure to biological hazards exists. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

At the present time, no OSHA standards are specifically directed at the evaluation and control of biological hazards associated with hazardous plants and animals which may be encountered during site activities. However, the OSHA standard listed below does contain information related to the control of hazards associated with the discovery and handling of biological and medical wastes. Also, the U.S. Army Corps of Engineers (USACE) requirements listed below directly apply to the conduct of operations affected by the presence of hazardous plants and animals.

- OSHA General Industry Standard 29 CFR 1910.1030;
- USACE EM 385-1-1, Section 6.D.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for operations where the potential exists for personnel exposure to biological hazards. The FM/SR UXO SUPER will also

ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in operations where exposure to biological hazards exist shall be familiar with the potential safety and health hazards associated with these hazards, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

Biological hazards which are usually found on site include insects, such as hazardous plants, snakes, ticks, bees, hornets and wasps, biting insects, scorpions and infectious waste. Employee awareness and the safe work practices outlined in the following paragraphs should reduce the risk associated with these hazards.

5.1.1 Hazardous Plants

During the conduct of site activities the number and variety of hazardous plants that may be encountered is large and extensive. The ailments associated with these plants range from mild hay fever to contact dermatitis, to carcinogenic affects. However the plants which present the greatest degree of risk to site personnel (i.e., potential for contact vs. effect produced) are those which produce tissue injury and skin reactions.

5.1.1.1 Plants Causing Skin and Tissue Injury

Contact with splinters, thorns and sharp leaf edges is of special concern to site personnel, as is the contact with the pointed surfaces found on branches, limbs and small trunks left by site clearing and grubbing crews. This concern stems from the fact that punctures, cuts and even minor scrapes caused by accidental contact may result in non-infectious skin lesions, and the

introduction of fungi or bacteria through the skin or eye. This is especially important in light of the fact that the warm moist environment created inside impermeable protective clothing is ideal for the propagation of fungal and bacterial infection. Personnel receiving any of the injuries listed above, even minor scrapes, should report immediately to the SSHO for initial and continued observation and care of the injury.

5.1.1.2 Plants Causing Skin Reactions

The poisonous plants of greatest concern are poison ivy, poison sumac, and poison oak. Poison ivy thrives in all types of light and usually grows in the form of a trailing vine, however, it can also grow as a bush and can attain heights of 10 feet or more. Poison ivy has shiny, pointed leaves that grow in clusters of three. Poison sumac is a tall shrub or slender tree that usually grows along swampy areas or ponds in wooded areas. Each poison sumac leaf stalk has 7 to 13 leaflets which have smooth edges. Poison oak is mostly found in the southeast and west. Poison oak resembles poison ivy, with one important difference. The poison oak leaves are more rounded rather than jagged like poison ivy and the underside of poison oak leaves are covered with hair.

5.1.1.2.1 The skin reaction associated with contacting these plants is caused by the body's allergic reaction to toxins contained in oils produced by the plant. Becoming contaminated with the oils does not require contact with just the leaves. Contamination can be achieved through contact with other parts of the plant such as the branches, stems or berries, or contact with contaminated items such as tools and clothing. The allergic reaction associated with exposure to these plants will generally cause the following signs and symptoms:

1. Blistering at the site of contact, usually occurring within 12 to 48 hours after contact;
2. Reddening, swelling, itching and burning at the site of contact;
3. Pain, if the reaction is severe; and
4. Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin.

5.1.1.2.2 If the rash is scratched, secondary infections can occur. The rash usually disappears in 1 to 2 weeks in cases of mild exposure and up to 3 weeks when exposure is severe. Preventative measures which can prove effective for most site personnel are:

1. Avoid contact with any poisonous plants on site, and keep a steady watch to identify, report and mark poisonous plants found onsite;
2. Wash hands, face or other exposed areas at the beginning of each break period and at the end of each work day;
3. Avoid contact with, and wash on a daily basis, contaminated tools, equipment and clothing; and

4. Barrier creams, detoxification/wash solutions and orally administered desensitization may prove effective and should be tried to find the best preventative solution.

5.1.2 Snakes

When site activities are conducted in warm weather on sites that are located in wooded, grassy or rocky environments, the potential for contact with poisonous snakes becomes a very real danger. Normally, if a person is approaching a snake, the noise created by the person is usually sufficient to frighten the snake off. However, during the warm months, extreme caution must be exercised when conducting site operations around areas where snakes might be found (i.e., rocks, bushes, logs, or in holes, crevices, and abandoned pipes). If poisonous snakes are identified onsite, ESE and EODT shall issue protective clothing, such as snake leggings, to site personnel. The rules to follow if someone is bitten by a snake are:

1. Do not cut "Xs" over the bite area as this will intensify the effect of the venom;
2. Do not apply suction to the wound since this has a minimal effect in removing venom;
3. Do not apply a tourniquet since this will concentrate the venom and increase the amount of tissue damage in the immediate area;
4. If possible, kill the snake, bag it and transport it with the victim or try to get a good look at it so it can be identified for proper selection of anti-venom;
5. Do not allow the victim to run for help since running increases the heart rate and will increase the spread of the venom throughout the body;
6. Keep the victim calm and immobile;
7. Have the victim hold the affected extremity lower than the body while waiting for medical assistance; and
8. Transport the victim to medical attention immediately.

5.1.3 Ticks

5.1.3.1 General Information

The Center for Disease Control (CDC) has noted the increase of Lyme Disease and Rocky Mountain Spotted Fever (RMSF) which are caused by bites from infected ticks that live in and near wooded areas, tall grass, and brush. Ticks are small, ranging from the size of a comma up to about one quarter inch. They are sometimes difficult to see. The tick season extends from spring through summer. When embedded in the skin, they may look like a freckle.

5.1.3.1.1 Lyme disease has occurred in 43 states, with the heaviest concentrations in the Northeast (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania), the upper Midwest (Minnesota and Wisconsin), and along the northern California coast. It is caused by deer ticks and the lone star ticks which have become infected with spirochetes. Female deer ticks are about one quarter inch in size, and are black and brick red in color. Male deer ticks are smaller, and completely black. Lone star ticks are larger and chestnut brown in color.

5.1.3.1.2 RMSF has occurred in 36 states, with the heaviest concentrations in Oklahoma, North Carolina, South Carolina, and Virginia. It is caused by Rocky Mountain wood ticks, and dog ticks which have become infected with rickettsia. Both are black in color.

5.1.3.1.3 The first symptoms of either disease are flu like chills, fever, headache, dizziness, fatigue, stiff neck, and bone pain. If immediately treated by a physician, most individuals recover fully in a short period of time. If not treated, more serious symptoms can occur.

5.1.3.1.4 If a site employee believes they have been bitten by a tick, or if any of the signs and symptoms noted above appear, the employee will contact the SSHO, who will authorize the employee to visit a physician for an examination and possible treatment.

5.1.3.2 Protective Measures

Standard field gear (work boots, socks and light-colored coveralls) provide good protection against tick bites, particularly if the joints are taped. However, even when wearing field gear, the following precautions should be taken when working in areas that might be infested with ticks:

1. When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair;
2. Spray outer clothing, particularly your pant legs and socks, BUT NOT YOUR SKIN, with an insect repellant that contains permethrin or permanone, or use a repellent with DEET, which can be applied to the skin;
3. When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible;
4. Tuck pant legs into boot tops or tape pants to boot tops to avoid ticks from crawling up the pant leg (this may not be an option at sites where extreme heat stress is anticipated);
5. If dressed in Level D or Modified Level D, and no other head protection is required, wear a hat to prevent ticks from getting into the hair (again, use caution as this may enhance heat stress);
6. If you find a tick, remove it by pulling on it gently with tweezers;
7. If the tick resists, cover the tick with salad oil for about 15 minutes to asphyxiate it, then remove it with tweezers;
8. Do not use matches, a lit cigarette, nail polish or any other type of chemical to "coax" the tick out;
9. Be sure and remove all parts of the tick's body, and disinfect the area with alcohol or a similar antiseptic after removal;

10. For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area, frequently seen with a small welt in the center; and
11. Also look for the signs of the onset of RMSF, such as an inflammation which is visible in the form of a rash comprised of many red spots under the skin, which appears 3 to 10 days after the tick bite.

5.1.4 Bees, Hornets and Wasps

Contact with stinging insects like bees, hornets and wasps may result in site personnel experiencing adverse health affects that range from being mildly uncomfortable to being life threatening. Therefore, stinging insects present a serious hazard to site personnel, and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are as follows:

1. The nests for these insects are frequently found in the type of remote wooded, grassy areas where many waste sites are located;
2. The nests can be situated in trees, rocks, bushes or in the ground, and are usually difficult to see;
3. Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active;
4. If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention;
5. Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock;
6. Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth and respiratory passages; and
7. The hypersensitivity needed to cause anaphylactic shock, can in some people, accumulate over time and exposure; therefore, even if someone has been stung previously, and has not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction upon receipt of another sting.

5.1.4.1 With these things in mind and with the high probability of contact with stinging insects, all site personnel shall comply with the following safe work practices:

1. If a worker knows that he is hypersensitive to bee, wasp or hornet stings, they must inform the SSHO of this condition prior to participation in site activities;
2. All site personnel will be watchful for the presence of stinging insects and their nests, and shall advise the SSHO if a stinging insect nest is located or suspected in the area;

3. Any nests located onsite shall be flagged off and site personnel shall be notified of its presence;
4. If stung, site personnel shall immediately report to the SSHO to obtain treatment and to allow the SSHO to observe them for signs of allergic reaction; and
5. Site personnel with a known hypersensitivity to stinging insects shall be required to obtain necessary emergency medications from their physician, such as epinephrine injectors, and will keep the medication on or near their person at all times.

5.1.5 Biting Insects

Many types of biting insects such as mosquitos, flies and fleas may be encountered onsite. The use of insect repellents will be encouraged by the SSHO if deemed necessary. The biting insects of greatest concern are spiders, especially the black widow and the brown recluse. These are of special concern due to the significant adverse health effects that can be caused by their bite.

5.1.5.1 The black widow is a coal-black bulbous spider 3/4 to 1 1/2 inches in length, with a bright red hour-glass on the under side of the abdomen. The black widow is usually found in dark moist locations, especially under rocks, rotting logs and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

1. Sensation of pinprick or minor burning at the time of the bite;
2. Appearance of small punctures (but sometimes none are visible); and
3. After 15 to 60 minutes, intense pain is felt at the site of the bite which spreads quickly, and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils and generalized swelling of face and extremities.

5.1.5.2 The brown recluse is brownish to tan in color, rather flat, 1/2 to 5/8 inches long with a dark brown "violin" shape on the underside. It may be found in trees, or in dark locations. Victims of a brown recluse bite may exhibit the following signs or symptoms:

1. Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite;
2. Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance;
3. Systemic affects may include a generalized rash, joint pain, chills, fever, nausea and vomiting; and
4. Pain may become severe after 8 hours, with the onset of tissue necrosis.

5.1.5.3 There is no effective first aid treatment for either of these bites. Except for very young, very old or weak victims, these spider bites are not considered to be life threatening, however medical treatment must be sought to reduce the extent of damage caused by the injected toxins.

5.1.5.4 If either of these spiders are suspected or known to be onsite, the SSHO shall brief the site personnel as to the identification and avoidance of the spiders. As with stinging insects, site personnel should report to the SSHO if they locate either of these spiders onsite or notice any type of bite while involved in site activities.

5.1.6 Scorpions

5.1.6.1 Scorpions are basically night animals and contact with humans is usually in the form of a person disturbing a scorpion in its day-time hiding place, which may include gloves or boots/shoes left unattended over night. Scorpions are most commonly observed in the gulf states and southwest, but are also seen in the south and southeast. In the United States the most commonly encountered scorpion is the "bark scorpion", referred to as such due to their preference for hiding under the loose bark of trees or in dead trees/logs. Scorpions are usually flat, straw to reddish brown in color, and range in size from 3/4 to 3 inches in length and are distinguishable by their long telson (tail), that ends in a curved stinger, and their pincher like claws. The scorpion venom of some species is capable of causing death in young or old people, and may cause severe adverse health affects in adults. The signs and symptoms typically associated with scorpion envenomation are highly variable depending upon the species involved, and may only involve localized pain/swelling. However, scorpion stings may cause any or all of the following:

1. Prickling sensation at the time of the sting, followed quickly by severe pain;
2. The victim may experience restlessness, breathing difficulty, convulsion, muscle cramps, nausea/vomiting, fever, headache, dizziness, abdominal pain, hypertension, rapid heart beat and profuse sweating; and
3. Generalized weakness for 24 hours or more following the sting.

5.1.6.2 There is no effective first aid treatment for scorpion stings, however, with very young and very old victims, or for severe envenomation, a polyvalent scorpion anti-venom may be given by an attending physician. Due to the variation in signs/symptoms which may result, any victim of a scorpion sting should be transported to a medical facility for observation and treatment. If possible capture the scorpion for later identification at the medical facility.

5.1.6.3 If scorpions are suspected or known to be onsite, the SSHO shall brief the site personnel as to the identification and avoidance of the scorpions. As with other stinging insects, site personnel should report to the SSHO if they locate scorpions or notice any type of bite while involved in site activities.

5.1.7 Ultraviolet Radiation From Sunlight

5.1.7.1 Skin Affects Resulting From Exposure

Personnel working outdoors in sunny environments risk exposure to ultraviolet (UV) radiation from sunlight. UV radiation produces chemical changes in the skin cells, which vary dependent

upon the time of year, geographic location, hour of the day and personal susceptibility. Generally after initial exposure to sunlight, a reddening of the skin may occur, which normally does not appear for several hours after exposure. This reddening is associated with "sun burn" and may cause pain, discomfort and limit the capabilities of site personnel. If the exposure has been excessive, the reddening of the skin may be accompanied by blistering and peeling of the outer layer of the skin. Another hazard associated with skin exposure to UV radiation from the sun is the production of skin cancer. Epidemiological studies have determined a positive association between excessive exposure to sunlight and skin cancer, with fair skinned people having the greatest risk.

5.1.7.2 Affects of Eye Exposure

Unprotected exposure to strong sunlight may cause photokeratitis (inflammation of the cornea), photoconjunctivitis (inflammation of the outer membrane of the eye), in sensitive persons, the potential for cataracts increases and retinal damage may also occur. Unprotected exposure to bright sunlight may cause acute physiological affects such as partial to complete closure of the eye lids (squinting), watering/tearing of the eyes and visual discomfort. These acute affects may impair personnel from performing assigned duties in an efficient, effective and safe manner and may interfere with the ability of site personnel to safely observe site operations.

5.1.7.3 Protective Measures

Upon exposure to hazardous levels of sunlight, the skin's self defense mechanism is activated. This mechanism involves a pigment in the skin, called melanin, which, upon exposure to the sun, rises to the surface of the skin giving it a tan coloration (suntan), and new melanin is produced in the lower regions of the skin. As moderate exposure increases, or continues, this process also continues and the color of the tan will, in most people, increase in darkness . The melanin in the skin absorbs UV radiation and acts as a protective layer over the skin regions below. This tanning will begin to fade if occasional exposure to sunlight is not continued. To further decrease the potential of receiving harmful exposures from the sun, the following work practices and controls should be implemented during site activities where personnel exposures to hazardous levels of sunlight may occur:

1. Skin exposure to strong sunlight should be minimized through the use of clothing and exposure periods gradually increased during initial annual exposure;
2. Sunscreen lotions with a SPF rating of at least 15 should be applied to exposed areas of the skin prior to initiation of daily operations, and re-applied periodically throughout the day since sweating may remove or dilute the lotion and reduce its effectiveness;
3. When feasible, work areas should be shaded through the use of tarpaulins or tents to protect workers from direct exposure to sunlight;
4. Hats made of a mesh material to allow cooling should be used to help shade and protect the eyes; and

5. For eye protection to bright sunlight, safety glasses with tinted lenses shall be used which meet the requirements of the American National Standards Institute (ANSI) Z80.3-1986 and Z87.1-1989 Standards.

5.1.8 Infectious Wastes

5.1.8.1 Due to the nature of typical hazardous waste sites, there exists the potential that medical and infectious waste could have been buried on site during past site operations. Current regulations provide strict guidelines on the disposal of medical and infectious waste and require infectious waste to be disposed of in clearly marked, red bags or containers. However, this is a relatively new regulatory requirement and past disposal operations may not have involved these type of well marked containers.

5.1.8.2 The hazards associated with medical and other infectious waste include:

1. Contact with contaminated sharps (needles, scalpels, etc.)
2. Exposure to blood or other body fluids contaminated with AIDS (HIV), Hepatitis B (HBV) or other bloodborne pathogens;
3. Exposure to virus and bacterially infected waste; and
4. Exposure to other types of biological hazards such as fungi, parasites, or experimental biological agents, etc.

5.1.8.3 To prevent possible exposure to infectious wastes, site personnel shall take the following precautions:

1. Site personnel shall remain constantly alert for signs that medical or infectious waste is present on site;
2. Site personnel shall, upon its discovery, report the presence of medical or biological waste to the SSHO immediately;
3. During excavations, an observer shall be positioned to observe the bucket and shall immediately notify the operator to halt excavation is suspect medical or biological waste is uncovered during the excavation;
4. If medical or biological waste is discovered, operations in the immediate area shall cease, site personnel shall evacuate the area, and the CO/COR shall be contacted to determine the course of action.

6.0 AUDIT CRITERIA

The following items related to operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;

3. The Documentation of Training form for the Daily Tailgate Safety Briefings; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 102

COLD STRESS PREVENTION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving cold environments.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, and operations involving potential personnel exposure to cold stress. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following American Conference of Governmental Industrial Hygienist (ACGIH) and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with this SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- ACGIH Threshold Limit Values and Biological Exposure Indices, 1993-1994.
- USACE EM 385-1-1, Section 6J

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for all operations involving potential personnel exposure to cold stress. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in site operations shall be familiar with the potential safety and health hazards associated with the conduct of operations in cold environments, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 INTRODUCTION

During activities conducted on UXO and waste sites, cold and/or windy environmental conditions can create serious safety and health threats to site workers. This SOP addresses the potential hazards associated with cold stress, and outlines the procedures for monitoring and controlling those hazards.

5.2 COLD STRESS HAZARDS

The affects experienced by site personnel when working in cold environments depend upon many environmental and personal factors, such as ambient air temperature, wind speed, duration of exposure, type of protective clothing and equipment worn, type of work conducted, level of physical effort, and health status of the worker. In cold environments, overexposure can cause significant stress on the body which can lead to serious, and potentially permanent injury. Cold may affect exposed body surfaces and extremities, or may affect the deeper body tissues and body core. Presented below is information about the most common cold stress disorders, their signs, symptoms, affects, and control techniques.

5.2.1 Cold Stress Disorders

5.2.1.1 Immersion Foot or Trench Foot

These two cold injuries occur as a result of exposure to cool or cold weather and persistent dampness or immersion in water. Immersion foot usually results from prolonged exposure when air temperatures are above freezing, whereas trench foot normally occurs from shorter exposure

at temperatures near freezing. The symptoms for each disorder are similar and include tingling, itching, swelling, pain and/or numbness, lack of sweating, and blisters.

5.2.1.2 Frostbite

Frostbite occurs when there is actual freezing of the water contained in the body tissues. This usually occurs when temperatures are below freezing, but excessive wind can result in frostbite even when ambient temperatures are above freezing. Frostbite can occur from several types of cold exposure, such as: exposure of bare skin to cold and wind; exposure to extremely cold ambient temperatures; skin contact with rapidly evaporative liquids (gasoline, alcohol or cleaning solvents) at temperatures below 39.2°F; or from skin contact with metallic objects whose temperatures are below freezing. The extremities are usually affected first since the body's initial response to cold stress is to decrease the heat loss from the blood by decreasing the blood flow to the extremities. The tissue damage caused by frostbite can be superficial, near the surface of the skin, or extend deep into body tissues which can cause severe tissue damage. During the initial stages of frostbite, the skin may have a prickly or tingling sensation and will later become numb with cold. The appearance of the effected skin may range from superficial redness of the skin to white, hard, frozen-looking tissues.

5.2.1.3 Hypothermia

Hypothermia results when the body looses heat faster than it can be produced. When this occurs, the blood vessels in the skin and extremities constrict, reducing the flow of warm blood to those areas which have a high surface area to volume relation. This reduction in blood flow reduces heat loss and usually affects the peripheral extremities first. Ears, fingers and toes begin to experience chilling, pain and then numbness due to loss of both blood flow and heat. Shivering begins as the body's core temperature begins to drop, and the body uses the shivering to compensate and create metabolic heat. Shivering is often the first sign of hypothermia. The pain and numbness in the extremities is an indication that the heat loss is increasing, but when shivering becomes severe and uncontrollable, the heat loss in the body core has become extreme. Further heat loss produces speech difficulty, reduced mental alertness, forgetfulness, loss of manual dexterity, collapse, unconsciousness and finally death.

5.2.2 Treatment of Cold Stress Disorders

The intent of all cold stress treatment is to bring the deep body core temperature back to its normal temperature of about 98.6°F. Work performed in cold environments should be discontinued temporarily for any worker who exhibits the signs or symptoms associated with hypothermia or frost bite. Workers exhibiting cold stress symptoms should be brought to a warm area and allowed to rest and warm-up. If a worker's clothing becomes wet, which reduces its insulation affect, it should be removed and replaced by dry clothing, or allowed to dry before resuming work. Warm, sweet, non-alcohol, decaffeinated drinks (not coffee) or soup should be

given to increase the body core temperature, and re-warming should be gradual.

5.2.2.1 For frostbite, the victim should be sheltered from the wind and cold and given warm drinks. If the frost bite is superficial, the frozen area(s) should be covered with extra clothing or blankets or warmed against the body. Do not use direct heat, and do not pour hot water over or rub the affected area. Warming should be gentle and gradual. Failure to do this could lead to bleeding in the tissues and increase the possibility of infection. If the frostbite is deep, (i.e. the affected area is frozen and hard to the touch), immediate medical attention should be obtained. The safe thawing of deep frostbite is beyond the expertise and facilities found on site.

5.2.3 Prevention of Cold Stress Disorders

5.2.3.1 Cold Stress Monitoring

Guidance for the monitoring of cold stress is provided by the ACGIH in the Threshold Limit Values and Biological Exposure Indices booklet (latest edition). In order to comply with the cold stress TLV, the following monitoring schedule will be implemented:

1. A suitable thermometer for measuring ambient temperatures shall be available on sites when the air temperature is below 60.8°F;
2. Whenever the air temperature onsite falls below 30.2°F, the temperature shall be measured and recorded at least once every two hours, unless sudden drops in the temperature are expected or noted, then it will be recorded once each;
3. Whenever the air temperature on site falls below 30.2°F, the wind speed shall be measured and recorded together with the air temperature;
4. The equivalent wind chill temperature shall be obtained from Table 102-1, and recorded, in all cases when air speed measurements are required;
5. The SSHO shall utilize the applicable TLV limits listed in Table 102-2 to determine if elevated control measures must be implemented during site activities.

5.2.3.2 Controls Implemented by Site Personnel

During work in cold environments, the SSHO will use the tailgate safety briefing to inform site personnel of the temperature and wind conditions anticipated for the day's site activities. The SSHO will also advise site personnel of the general practices, listed below, which should be utilized in the prevention and control of cold stress.

1. Wearing adequate, appropriately layered clothing, including a water repellant outer layer if precipitation is forecasted;
2. Using layered clothing which should include, an inner most layer (such as cotton or silk) to trap heat and absorb perspiration, an insulating layer of wool or synthetic fiberfill (such as polypropylene), a layer of work weight clothing, and an outer protective layer designed to retain heat and be wind/water proof (such as nylon, or Gortex™);

Table 102-1. Equivalent Chill Temperature

Estimated Windspeed (in mph)	Actual Temperature Reading (° F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (° F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Windspeeds greater than 40 mph have little additional effect	LITTLE DANGER In < 1 hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute				GREAT DANGER Flesh may freeze within 30 seconds			
	Trench foot and immersion foot may occur at any point on this chart.											

Table 102-2. ACGIH Cold Stress TLVs

TLV Temp.	Working Conditions or Task to be Performed	Required Control Measures
< 60.8°F	Any site or work condition	Thermometer required on site
	Fine work performed continuously for more than 10-20 min.	Special provisions for keeping the hands warm, i.e., radiant heaters, warm air jets, etc.
	Tasks with sedentary work load	Gloves are to be used by workers
< 39.2°F	Site with windy conditions	Reduce cooling effect of wind by using shields or an easily removable wind breaker
	Task where exposed areas of the body cannot be protected from cold or frostbite	Auxiliary heating units are to be supplied
	Tasks where clothing may become wet with either perspiration or water	Provisions shall be made to allow site personnel to change into dry clothes
	Workers handling evaporative liquids	Special precautions needed to ensure clothing does not become soaked with liquid
	Tasks with light work load	Gloves are to be used by workers
≤ 35.6°F	Workers who become emersed in water or whose clothing becomes wet	Treatment for hypothermia and immediate change of dry clothing provided
< 30.2°F	Any task	Air temperature and windspeed (if over 5 mph) recorded at least every 4 hours; cover metal handles with insulating material
< 19.4°F Air	Tasks with moderate work	Gloves to be used by workers
< 19.4°F ECT	Any task	Heated warming shelters with warm drinks will be made available for breaks Record ECT along with air temperature readings Warn personnel not to contact unprotected metal parts with bear skin
< 10.4°F ECT	Any task	Buddy system enforced, protect from wind to greatest extent possible, acclimatize workers, moderate workload to prevent perspiration, and conduct worker cold stress training
< -11.2°F or < 0°F with 5 mph wind	Personnel who routinely work at this temperature	Personnel are to be medically certified as suitable for this level of exposure
≤ -25.6 ECT	Any level of work or type of task	No unprotected skin exposure

ECT - Equivalent Chill Temperature.

Air - Ambient air temperature

3. Wearing gloves, socks and a hat that are synthetic or wool insulated;
4. Removing outer layers of clothing during breaks in heated shelters to prevent inner layers from getting wet with perspiration;
5. Covering of all exposed skin and use of a wind breaker in windy, cold conditions;
6. Eating well-balanced meals and maintain adequate intake of non-alcoholic, de-caffeinated fluids;
7. Seeking shelter in a warm protected area when signs and symptoms of cold stress become evident;
8. Protecting clothing from getting wet with perspiration during site activities by monitoring and moderating the level of physical activity, and if necessary, removing excessive layers of clothing; and
9. If the potential exists for clothing to become wet during site operations, site personnel should report to work with an extra set of work and insulated clothing.

5.2.3.3 Controls To Be Implemented On Site

5.2.3.3.1 In addition to the personal control methods listed above, the following measures will be provided to assist site personnel in preventing and abating cold stress:

1. If the effective chill temperature (ECT) is expected to be less than 19.4°F, a heated shelter will be provided both in the SZ, and when permissible, in the EZ to allow personnel to take warming breaks IAW the specified work/rest schedule;
2. Warm drinks, such as hot cocoa, hot cider, hot herbal teas, warm broths or decaffeinated coffee or hot tea will be provided in the warming shelters;
3. If the ECT is less than 19.4°F or if the calm air temperature is less than 20°F, a minimum work/rest regiment of one 10 minute break every hour, with a 30 minute lunch break will be implemented; and
4. For temperatures above 20°F, calm air temperature or above the ECT of 19.4°F the normal work/rest schedule of one 15 minute break in the morning and afternoon, with a 30 minute lunch break will be used as the standard, but site personnel will still be encouraged to take more frequent breaks they begin to experience significant signs or symptoms of cold stress.

5.2.3.3.2 When permitted by site conditions and contamination levels, personnel utilizing shelters inside the EZ will under go an abbreviated decontamination prior to entry. This abbreviated decontamination will include:

1. Soapy water wash and clean water rinse of outer chemical resistant gloves, boots, and if needed suits;
2. Removal of outer and inner chemical resistant gloves; and
3. Washing of exposed hands, face and neck, using handy/baby wipes.

5.2.3.3.3 Upon leaving the warming shelter, EZ personnel will re-don chemical resistant inner and outer gloves, IAW the PPE donning procedures listed in the SSHP.

5.2.3.4 Additional Work/Rest Cycles

To date, there are no Federally or USACE mandated regulations related to work/rest schedules for cold stress. The work/rest cycle outlined in paragraph 5.2.3.3 is a recommended routine, but may not be adequate for all cold weather conditions which may be encountered. The ACGIH has published a work/rest schedule, which is provided in Table 102-3 of this SOP. However, this table only applies to, and should be implemented for, temperatures below -4°F. Therefore, for temperatures above -4°F, workers shall be encouraged to utilize the work rest schedule listed above or to seek shelter in a warm area especially if they exhibit cold stress symptoms such as heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability or euphoria.

5.2.4 Cold Stress Documentation

The SSHO shall be responsible for recording all cold stress related information. This will include training sessions, environmental conditions and environmental monitoring data. Training sessions shall be documented using the EODT Training Roster. Enviromental conditions and monitoring data will be recorded in the Site Safety Log, and/or Site Monitoring Log.

Table 102-3. TLV Work/Rest Schedule for 4-Hour Work Shift *

Air Temp.	No Wind		5 MPH Wind		10 MPH Wind		15 MPH Wind		20 MPH Wind	
°F Approx.	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-4 to -8	Normal	1	Normal	1	Normal	1	Normal	1	Normal	1
-9 to -13	Normal	1	Normal	1	Normal	1	Normal	1	75 min.	2
-14 to -18	Normal	1	Normal	1	Normal	1	75 min.	2	55 min.	3
-15 to -19	Normal	1	Normal	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	Normal	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-25 to -29	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-30 to -34	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-35 to -39	40 min.	4	30 min.	5	Non-emergency work should cease					
-40 to -44	30 min.	5	Non-emergency work should cease							
-45 & Below	Non-emergency work should cease									

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up cycle in a warm location and with an extended break in a warm location (e.g. lunch) at the end of the 4-hours. For light-to-moderate work: apply the schedule one step lower.

2. The following is suggested as a guide for estimating wind velocity if other, more accurate means are not available: 5 mph - light flag moves; 10 mph - light flag fully extended; 15 mph - raises newspaper sheet; 20 mph - blowing and drifting snow.

3. This table applies only to acclimatized workers with appropriate dry clothing for winter work.

* Adapted from the "1993-1994 Threshold Limit Values and biological Exposure Indices, American Conference of Governmental Industrial Hygienist, Cincinnati, OH.

6.0 AUDIT CRITERIA

The following items related to operations conducted in hot or cold environments will be audited to ensure compliance with this SOP:

1. The Daily Operational Log;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefings;
4. The Site Monitoring Log;
5. The Site Safety Log; and
6. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 109

FIRE PREVENTION AND PROTECTION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving fire prevention.

2.0 SCOPE

This SOP applies to all site operations requiring fire prevention and protection. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart F;
- Applicable sections of OSHA General Industry Standard 29 CFR Part 1910, Subpart L; and
- USACE EM 385-1-1, Section 9.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for operations where fire protection and prevention is needed. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to

its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in operations shall be familiar with the potential safety and health hazards associated with the conduct of this SOP, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 CAUSES OF FIRES AND EXPLOSIONS

Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the conduct of site activities, such as moving drums, mixing/bulking of site chemicals and during refueling of heavy or hand held equipment. Some potential causes of explosions and fires include:

1. Mixing of incompatible chemicals, which cause reactions that spontaneously ignite due to the production of both flammable vapors and heat;
2. Ignition of explosive or flammable chemical gases or vapors by external ignition sources;
3. Ignition of materials due to oxygen enrichment;
4. Agitation of shock or friction-sensitive compounds;
5. Welding and cutting operations;
6. Hot surfaces and frictional heat sources;
7. Sparks, whether from static, electrical or mechanical sources;
7. Careless handling of matches, cigarettes and other lighted materials.

5.2 FIRE PREVENTION

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel onsite and members of the general

public. Site personnel conducting operations involving flammable or combustible material shall follow the guidelines listed below to aid in the prevention of fires and explosions.

5.2.1 Ignition Sources

All sources of ignition will be prohibited within 50 feet of a potential fire or explosion hazard. Ignition sources which may be of concern are: smoking; small engines and their exhausts; heavy equipment engines and their exhaust; non-intrinsically safe electrical hand tools, lights, equipment, etc.; steel hand tools capable of creating sparks; open flames; non-intrinsically safe monitoring instruments; and room/area heating devices.

5.2.2 Site Inspections

To ensure adequate fire protection, the SSHO will inspect the site daily to ensure that all flammable and combustible materials are being safely stored in appropriate containers in properly configured and segregated storage areas. The SSHO will also ensure that sources of ignition are removed a safe distance from storage areas.

5.2.3 Storage of Flammable and Combustible Materials

5.2.3.1 Approved Containers

Quantities of flammable liquids greater than one gallon, shall be stored or handled in OSHA approved safety cans only. These cans have a built-in flame arrestor and a tight-fitting self closing lid to reduce the possibility of vapors escaping from the can. For quantities of flammable liquids of one gallon or less, the original container or an OSHA approved safety can shall be used for handling or storage.

5.2.3.2 General Storage Requirements

Site personnel shall utilize the guidelines and procedures listed in this paragraph when storing flammable and combustible materials on site.

1. Flammable materials shall be stored in a segregated area located away from spark or ignition sources, with flagging, or other barrier materials, erected at a radius of fifty feet from the storage area, and "NO SMOKING MATCHES OR OPEN FLAME signs posted at the fifty foot barrier line;
2. If, due to site configuration, a fifty foot radius barrier can not erected around the storage area, signs stating "NO SMOKING MATCHES OR OPEN FLAME WITHIN 50 FEET" will be posted at the storage location;
3. For storage inside a building, no more than 25 gallons of flammable materials may be stored outside of approved fire cabinet, and no more than 60 gallons of flammable or 120 gallons of combustible liquids may be stored in each cabinet;
4. For storage of containers (of not more than 60 gallons each) outside, no more than 1,100 gallons shall be stored in one designated area, with at least five feet separating

storage areas;

5. Outdoor storage areas shall be at least 20 feet from the nearest building, and there shall be a 12 foot wide fire truck access lane within 200 feet of the storage area;
6. Storage areas outside shall be graded to allow collection of spilled material or provided with a 12 inch curbed or earthen dike containment system of sufficient volume to contain the contents stored in the area, and provisions shall be made for drainage or collection of accumulated rain water or spilled materials;
7. Metal drums used for storing flammable/combustible liquids shall be equipped with self-closing safety faucets, vent bung fittings, grounding cables and drip pans, and shall be stored outside buildings in an area approved by the SSHO;
8. The storage area shall be kept free of weeds, debris and other combustible materials not related to the storage; and
9. At least one fire extinguisher of 20B units or greater shall be located between 25 and 75 feet of outdoors storage areas.

5.2.4 Dispensing Flammable and Combustible Liquids

When dispensing flammable or Combustible liquids from one container to another, the following requirements shall apply:

1. Areas where flammable or combustible liquids are dispensed in quantities greater than five gallons shall be separated from other operations must be at least 25 feet;
2. Spill containment shall be provided in the dispensing area;
3. All tanks, hoses and containers of five gallons or less shall be kept in metallic contact during transfer operations;
4. Transfer of flammable liquids in containers in excess of five gallons shall be done only when the two containers are electrically bonded, and the container being dispensed from shall be grounded;
5. Natural or mechanical ventilation shall be provided to maintain flammable vapors below 10% of the lower explosive limit; and
6. Transfer of liquids by air pressure is not permitted and either a non-sparking hand pump or gravity feed shall be used;

5.2.5 Handling Liquids at Point of Final Use

When using flammable or combustible liquids at the point of final use, the following requirements shall apply:

1. Flammable liquids shall be kept in closed containers;
2. Leakage or spillage of flammable or combustible liquids shall be collected and disposed of quickly and properly; and
3. No open flames or other sources of ignition will be allowed within 50 feet of operations involving flammable or combustible liquids.

5.2.6 Service and Refueling Areas

The following requirements shall apply to service and refueling areas:

1. Only approved storage containers, trucks and hoses shall be used;
2. No smoking will be allowed within 50 feet of areas where fueling operations are being conducted, and conspicuous signs shall be posted prohibiting smoking in the area;;
3. The motors of all equipment being fueled shall be shut off during fueling; and
4. A fire extinguisher of at least 20B units or greater shall be located within 75 feet of fueling operations.

5.2.7 Handling and Dispensing

Site personnel shall utilize the guidelines and procedures listed in this paragraph when dispensing flammable and combustible materials.

5.3 FIRE PROTECTION

5.3.1 General Requirements

The general requirements listed below shall be followed to help provide effective fire protection and shall apply to all sites:

1. All areas where potentially explosive/flammable atmospheres may accumulate shall be monitored using a combustible gas indicator;
2. Prior to initiation of site activities involving explosive/flammable materials, all potential ignition sources shall be removed or extinguished;
3. Non-sparking and explosion-proof equipment shall be used whenever the potential for ignition of flammable/explosive gases/vapors/liquids exists; and
4. Dilution or induced ventilation may be used to decrease the airborne concentration of explosive/flammable atmospheres to below 10% of the lower explosive limit.

5.3.2 Training

All site personnel involved in operations where flammable or combustible liquids or materials are used, or may be encountered, shall be given training, as part of the initial mobilization training, which covers the anticipated hazards and the relevant control techniques. This training shall include fire extinguisher training which covers selection and use of fire extinguishers.

5.3.3 Fire Extinguishers

Portable fire extinguishers shall be selected and conspicuously located on site IAW the type of fire or explosion hazard anticipated. To determine the size and type of extinguishers required, consult the SSHP.

5.4 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment (PPE) shall be used in preventing or reducing exposures associated with fire prevention and protection operations.

These requirements will be implemented unless superseded by site specific requirements stated in the Site Safety and Health Plan.

1. Personnel who may come in contact with flammable or combustible liquids shall be assigned appropriate PPE to avoid skin or eye contact with the material; and
2. In the event of an onsite fire, the SSHO will assess the situation, determine the potential hazards and if need be, assign levels of PPE to be worn during fire fighting.

6.0 AUDIT CRITERIA

The following items related to fire protection and prevention operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefing;
4. The Daily Safety Inspection Checklists; and
5. The fire extinguisher inspection cards.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 110

HAZARD COMMUNICATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of products containing hazardous substances.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involving in the use of products containing hazardous substances. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926.59;
- OSHA General Industry Standard 29 CFR Part 1910.1200; and
- USACE EM 385-1-1, Sections 6.A and 6.B.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for all operations involving the use of products containing hazardous substances. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in operations involving hazardous substances shall be familiar with the potential safety and health hazards associated with the conduct of those operations, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 MATERIAL SAFETY DATA SHEETS (MSDS)

5.1.1 MSDS Availability

5.1.1.1 An MSDS for each product containing a hazardous chemical to which employees are or may be exposed, will be obtained and made readily available to all site employees. MSDS's will be located at each project site. The SSHO will be responsible for obtaining and maintaining MSDS's.

5.1.1.2 The SSHO will review relevant MSDS's for significant safety and health information, which will then be passed on to the affected employees during formal training sessions. MSDS's will also be reviewed by the SSHO for completeness. If an MSDS is missing or considered to be incomplete/insufficient, a new MSDS will be requested from the manufacturer.

5.1.1.3 MSDS's will be available for all employees in their work area for review during each work shift. If MSDS's are not available or a new chemical being used on site does not have a corresponding MSDS, the SSHO will obtain the MSDS from the manufacturer as soon as possible.

5.1.1.4 An MSDS which does not specifically identify the hazardous chemicals contained in the project will be accepted if:

1. The information has been classified as a trade secret; and

2. The MSDS contains adequate information related to the physical and health hazards associated with the product.

5.2 CHEMICAL INVENTORY

A Site Specific Chemical Inventory will be maintained by the SSHO. This inventory will include all products containing hazardous chemicals. The Hazardous Chemical Inventory Form (See Figure 1 in Section 7.0) will be used to maintain the site specific chemical inventory.

5.3 LABELING

5.3.1 Container Labeling

No container of hazardous chemicals will be released for use until the following label information is verified:

1. Identification of the chemical;
2. Appropriate hazard warnings; and
3. Name and address of chemical manufacturer, or distributor (applies only to manufacturer's labels).

5.3.2 Secondary Container Labeling

To further ensure that employees are readily provided with information concerning chemicals in their work areas, the SSHO will ensure that all secondary containers are properly labeled with an appropriate hazard communication label. This label must communicate the identity of the hazardous chemicals contained in the product and their appropriate physical and health hazard warnings.

5.4 EMPLOYEE INFORMATION AND TRAINING

5.4.1 General

The SSHO will arrange for employee information and training at the time of initial assignment (for existing hazardous chemicals), whenever a new hazardous chemical is introduced into the work area or an employee changes job locations where new chemicals are encountered.

5.4.2 Required Information

Employees will be trained to recall, in simple language, the following basic information about each hazardous chemical:

1. The basic requirements of the OSHA Hazard Communication Standard, including employee rights under the regulation;
2. Operations/processes where hazardous chemicals are used and the potential for exposure exists;
3. Location of the written Hazard Communication (HAZCOM) Program, the Chemical

Inventory and the MSDSs;

4. How chemicals may be detected/monitored (instrumentation, color, odor, state);
5. Physical hazards (i.e., flammability, reactivity);
6. Chemical hazards, including the effects a chemical has on the body (long and short term) through inhalation, ingestion or skin contact;
7. How workers can project themselves from over exposure or emergency situations (engineering controls, work practices, personal protective devices and emergency procedures);
8. Steps that have been taken to lessen or prevent exposure to hazardous chemicals through implementation of the HAZCOMP;
9. Spill response procedures for chemical emergencies;
10. Emergency and first aid procedures to follow if employees are over exposed to any hazardous chemicals; and
11. How to read labels and review MSDS's to obtain appropriate hazard information.

5.4.3 Documentation of Training

Hazardous Communication Training will be documented by the SSHO using the Employee Hazard Communication and Training Checklist (See Figure 2 in Section 7.0).

5.5 HAZARDS FROM NON-ROUTINE TASKS

Periodically, employees are required to perform potentially hazardous, non-routine tasks which may involve chemical or physical hazards. Prior to starting work on such tasks, the SSHO will give each affected employee information about the hazards to which they may be exposed. This training will be documented in the Site Training Log, and will include:

1. Specific hazards (chemical and physical);
2. Protective safety measures to be utilized; and
3. Measures that have been or will be taken to lessen the hazards, including ventilation, respirators, PPE, a standby person, and emergency procedures.

5.6 INFORMING CLIENTS/SUBCONTRACTORS

5.6.1 The SSHO will ensure that outside clients/subcontractors are provided with the following information to allow them to work safely on site:

1. Hazardous chemicals to which they may be exposed while on the job site;
2. Precautions and protective measures the employees may take to avoid possible exposure; and
3. The rules and regulations regarding fire and ignition sources around flammable materials, and rules regarding smoking, welding, grinding, etc.

5.6.2 Each client/subcontractor will be instructed to inform the SSHO of any hazardous

chemicals which they bring on site and will provide a copy of the MSDS for each specific chemical(s).

5.7 INDUSTRIAL HYGIENE SURVEY

5.7.1 Periodic surveys will be performed to evaluate the potential for employee exposure to chemicals on project sites. These surveys will be used to assess exposure levels and the effectiveness of engineering, work practice and personal protective equipment controls.

5.7.2 These efforts will be coordinated by the SSHO and the FM/SR UXO Super, and will include:

1. A walk-through evaluation of potential chemical exposures utilizing the chemical inventory, MSDS's, and, when required, air sampling equipment;
2. A review of occupational illness records for trends of hazard exposure;
3. A review of engineering controls and personal protective measures; and
4. Recommendations for future control methods.

5.7.3 Where a question exists concerning employee exposure to hazardous chemicals, engineering controls or PPE requirements, the CIH will be contacted immediately.

5.8 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following operational precautions personal protective equipment shall be used in preventing or reducing exposures associated with operations involving the use of products containing hazardous substances.

1. Operations where hazardous substances are used will be conducted in well ventilated areas, and where needed and available, direct reading instruments will be used to assess personnel exposure; and
2. All personnel will wear chemical protective gloves, clothing, etc., as specified by the MSDS.

6.0 AUDIT CRITERIA

The following items related to operations conducted under this SOP will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Site Specific Chemical Inventory Forms;
3. The Documentation of Training form for the initial site hazard training;
4. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
5. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

Attachment 1 . . . . . Site Specific Chemical Inventory Form
Attachment 2 . . . . . Documentation of Hazard Communication Training Form

SITE SPECIFIC CHEMICAL INVENTORY FORM

Site Name/Location: _____ Site Safety Officer: _____

_____

DATE	PRODUCT NAME	SUPPLIER'S NAME AND ADDRESS	HAZARDOUS CHEMICALS	MSDS AVAILABLE	CONTAINER SIZE/TYPE	LOCATION STORED

Attachment 1

DOCUMENTATION OF HAZARD COMMUNICATION TRAINING

SITE INFORMATION

Site Name:	Date:
Location:	Instructor:

TRAINING ELEMENTS COVERED

Initial	Topic	Initial	Topic
	Requirements of 29 CFR 1910.1200		Target organs affected
	Elements of HAZCOM Program		Physical hazards (fire, explosion, etc.)
	Local of Program, MSDS's & Inventory		Detection of and protection from exposure
	Hazardous substance operations/processes		Spill/emergency response
	Acute/chronic health hazards		Labeling requirements

HAZARDOUS SUBSTANCES/PRODUCTS AND MSDS's REVIEWED

Initial	Hazardous Substance/Product	Initial	Hazardous Substance/Product

TRAINING COURSE ATTENDANTS

My signature below indicates that I have received training in the above listed topics as they relate to the hazardous substances and products with which I work, and I am familiar with the requirements of the *EODT* Hazard Communication Program.

Name (printed)	Signature	Company/Organization

"Use or disclosure of data contained on this sheet is subject to the restrictions on the title page of this document."

DOCUMENTATION OF HAZARD COMMUNICATION TRAINING

Location:	Date:

TRAINING COURSE ATTENDANTS (cont.)

My signature below indicates that I have received training in the above listed topics as they relate to the hazardous substances and products with which I work, and I am familiar with the requirements of the *EODT* Hazard Communication Program.

Name (printed)	Signature	Company/Organization

Attachment 2

"Use or disclosure of data contained on this sheet is subject to the restrictions on the title page of this document."

STANDARD OPERATING PROCEDURE 111

HEAT STRESS PREVENTION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving hot environmental conditions.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, and operations involving potential personnel exposure to heat stress. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following American Conference of Governmental Industrial Hygienist (ACGIH) and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with this SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- ACGIH Threshold Limit Values and Biological Exposure Indices, 1993-1994.
- USACE EM 385-1-1, Section 6J

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for all operations involving potential personnel exposure to heat stress. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information

related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in site operations shall be familiar with the potential safety and health hazards associated with the conduct of operations in hot environmental conditions, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 INTRODUCTION

During activities conducted on UXO and waste sites, hot environmental conditions can create serious safety and health threats to site workers. This SOP addresses the potential hazards associated with heat stress, and outlines the procedures for monitoring and controlling those hazards.

5.2 HEAT STRESS

Heat stress is one of the most common (and potentially serious) illnesses that can affect site personnel. The most common cause of heat stress during site activities is the affect that PPE has on the bodies natural cooling mechanism. Impermeable PPE interferes with the evaporation of perspiration and causes the body to retain metabolic and environmentally induced heat. Individuals will vary in their susceptibility and degree of response to heat stress. Factors which may predispose a worker to heat stress, or increase susceptibility, include: lack of physical fitness; lack of acclimatization to hot environments; degree of hydration; level of obesity; current health status (i.e., having an infection, chronic disease, diarrhea, etc.); alcohol or drug use; and the worker's age and sex. For the remainder of this SOP reference to "liquids" shall indicate water or an electrolyte replacement solution - not tea, coffee or soft drinks.

5.2.1 Heat Stress Disorders

5.2.1.1 Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet chafing clothes. This condition can decrease a worker's ability to tolerate hot environments.

1. Symptoms: Mild red rash, especially in areas of the body which sweat heavily.
2. Treatment: Decrease amount of time in protective gear and provide powder such as corn starch or baby powder to help absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes if needed.

5.2.1.2 Heat Cramps

Heat cramps are caused by a rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat related cramps are often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke.

1. Symptoms: Acute, painful spasms of voluntary muscles such as the back, abdomen and extremities.
2. Treatment: Remove victim to a cool area and loosen restrictive clothing. Stretch and massage affected muscles to increase blood flow to the area. Have patient drink one to two cups of liquids immediately, and every twenty minutes thereafter. Consult with physician if condition does not improve. If available, an electrolyte replacement solution should be taken along with water. Consumption of soft drinks will not be adequate and may aggravate the condition.

5.2.1.3 Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by excessive loss of fluids from the body. This condition leads to inadequate blood supply and cardiac insufficiency. Heat exhaustion is less dangerous than heat stroke, but nonetheless must be treated. If allowed to go untreated, heat exhaustion can quickly develop into heat stroke.

1. Symptoms: Pale or flushed, clammy, moist skin, profuse perspiration, and extreme weakness. Body temperature is basically normal or slightly elevated, the pulse is weak and rapid, and breathing is shallow. The individual may have a headache, be dizzy or nauseated.
2. Treatment: Remove the individual to a cool, air-conditioned place, loosen clothing, elevate feet and allow individual to rest. Consult physician, especially in severe cases. Have patient drink one to two cups of liquids immediately, and every twenty minutes thereafter. Total liquid consumption should be about one to two gallons per day. If the signs and symptoms of heat exhaustion do not subside, or become more severe, immediate medical attention will be required.

5.2.1.4 Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the heat regulating mechanisms of the body. The failure of the individual's temperature control mechanism causes the perspiration system to stop working correctly. When this occurs, the body core temperature rises very rapidly to a point (105+°F) where brain damage and death will result if the person is not cooled quickly.

1. Symptoms: The victims skin is hot, and may or may not be red and dry, due to the fact that the individual may still be wet from having sweat while wearing protective clothing earlier; nausea; dizziness; confusion; extremely high body temperatures, rapid respiratory and pulse rate; delirium; convulsions; unconsciousness or coma.
2. Treatment: Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. Cool the victim by either sponging or immersing the victim in very cool water to reduce the core temperature to a safe level (<102° F). If conscious, give the victim cool liquids to drink. Observe the victim and obtain immediate medical help. Do not give the victim caffeine or alcoholic beverages.

5.2.2 Preventative Measures

5.2.2.1 Minimal Preventative Measures

In order to avoid heat related illnesses, proper preventative measures shall be implemented whenever environmental conditions dictate the need. The preventative measures listed in this paragraph represent the minimal steps to be taken and shall include the following procedures:

1. The SSHO shall examine each site worker prior to the start of daily operations in order to determine the individuals susceptibility to heat stress. Workers exhibiting factors which make them susceptible to heat stress will be closely monitored by the SSHO.
2. Site workers shall be trained to recognize and treat heat related illnesses. This training shall include the signs, symptoms and treatment of heat stress disorders as outlined in paragraph 5.2.1 of this SOP.
3. Workers will be encouraged to drink a minimum of sixteen ounces of liquids prior to start of work in the morning, after lunch and prior to leaving the site at the conclusion of the days activities. Disposable four to twelve ounce cups and liquids shall be provided onsite. Acceptable liquids will include water and an electrolyte replacement solution, with the intake of each being equally divided. Liquids containing caffeine are to be avoided.
4. When ambient conditions and site workload requirements dictate, as determined by the SSHO, workers will be encouraged to drink a minimum of sixteen (16) to thirty-two (32) ounces of liquids during each rest cycle.

5. A shelter or shaded rest area will be provided where workers may be protected from direct sunlight during rest periods.
6. Monitoring of ambient or physiological heat stress indices shall be conducted to allow prevention and/or early detection of heat induced stress. Monitoring shall be conducted IAW paragraph 5.2.3 of this SOP.
7. Site workers will be given time to acclimatize to working in hot environments. Acclimatization usually takes two to six days and allows the worker's body to become adjusted to working in hot environments. This process involves a gradual increase of the workload over the two to six day period. The recommended acclimatization schedule suggests starting workers at fifty percent of the anticipated work load and increasing each day by ten percent. For fit or trained individuals, the acclimatization period may be shortened to two or three days.

5.2.2.2 Designated Sheltered Rest Areas

5.2.2.2.1 To allow site personnel may seek refugee from the radiant heat, ESE will provide one or more designated sheltered rest areas in both the EZ and the SZ. In addition, cool non-caffeinated liquids (i.e., water, electrolyte replacement solutions, fruit drinks, etc.) will be provided to the personnel utilizing these areas. Whenever possible, these areas will also be provided with fans to circulate the air under the shelter, thereby enhancing the cooling effect of perspiration.

5.2.3.2.2 Personnel inside the EZ who enter the sheltered EZ rest area and are wearing Modified Level D PPE, as defined in this SSHP, will under go an abbreviated decontamination prior to entry. This abbreviated decontamination will include:

1. Soapy water wash and clean water rinse of outer chemical resistant gloves, boots, and if needed suits;
2. Removal of outer and inner chemical resistant gloves; and
3. Washing of exposed hands, face and neck, using handy/baby wipes.

5.2.2.2.3 Upon leaving the shelter, EZ personnel will re-don chemical resistant inner and outer gloves, IAW the PPE donning procedures listed in the SSHP.

5.2.3.3 Additional Preventative Measures

When possible and/or feasible, the following measures will also be implemented to aid in prevention or reduce the affects of heat induced stress:

1. Designated rest areas will be provided with ventilation to aid in reducing the air temperature, and if possible, or necessary, air conditioning devices will be used to maintain the rest area temperature between 72 and 76°F.

2. Cooling devices will be provided to aid in body heat exchange. Cooling devices may include cooling jackets, vests or suits and field showers or hose-down areas. Depending on the severity of the heat exposure some form of artificial cooling may be required to ensure protection of the workers.
3. Workers will be encouraged to achieve and maintain an optimum level of physical fitness. Increased physical fitness will allow workers to better tolerate and respond to hot environments and heavy work loads. In comparison to an unfit person, a fit person will have: less physiological strain; a lower heart rate and body temperature; and a more efficient sweating mechanism.

5.2.3 Physiological Heat Stress Monitoring

When site personnel are engaged in site activities involving the use of semi-permeable or impermeable clothing in ambient temperatures greater than 70°F, physiological monitoring shall be conducted. The goal of all heat stress monitoring is to ensure that the worker's body temperature does not exceed 100.4°F. The physiological monitoring methods listed below are to be implemented based upon the severity of the heat and work load. As a minimum, the SSHO shall monitor the worker's heart rate as an indication of potential heat stress. However, if monitoring with the heart rate method indicates the need for closer, more direct monitoring, the oral temperature method will be implemented. The need for monitoring body water loss will be determined by the SSHO, and will be based upon observation of the sweat loss experienced by site personnel during their work cycle. The frequency of physiological monitoring shall be determined using the information presented in Table 111-1.

5.2.3.1 Heart Rate Monitoring

The worker's baseline heart rate should be recorded prior to initiation of site activities by measuring the radial pulse rate for thirty seconds. After each work cycle, the heart rate should be measured by taking the pulse rate (PR) as early as possible into the resting period. Taking the radial (wrist) pulse rate is the preferred method, however the carotid (neck) pulse rate may be taken if a worker has difficulty finding the radial pulse. The PR at the beginning of the rest period should not exceed one hundred and ten (110) beats per minute (bpm). If the PR is higher than 110 bpm, the next work period should be shortened by thirty-three percent, while the length of the rest period stays the same. If the PR exceeds 110 bpm at the beginning of the next rest period, the work cycle should be further shortened by thirty-three percent. This procedure is continued until the PR at the beginning of the rest cycle is maintained below 110 bpm.

5.2.3.2 Oral Temperature Monitoring

If deemed necessary by the SSHO, 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 or at a frequency determined by Table 111-1. Whenever the OT exceeds 99.6°F, the work cycle must be shortened by one third, without changing the length of the rest period. If a worker's OT has exceeded 99.6°F, test the OT again at the end of the rest cycle, and do not allow the worker to return to work until the OT drops below 99.6°F. If a worker's OT exceeds 100.4°F the worker shall not be allowed to work in impermeable or semi-permeable PPE for the remainder of that work day.

Table III-1. Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers [a, d]

ADJUSTED TEMPERATURE[b]	NORMAL WORK ENSEMBLE[c]	IMPERMEABLE ENSEMBLE
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°- 90°F (30.8°- 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°- 87.5°F (28.1°- 28.1°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°- 82.5°F (25.2°- 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°- 77.5°F (22.5°- 25.2°C)	After each 150 minutes of work	After each 120 minutes of work

[a] For work levels of 250 kilocalories/hour.

[b] Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows. Use decimal expression of % sunshine).

[c] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

[d] Source: NIOSH/OSHA/USCG/EPA. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. DHHS (NIOSH) 85-115. Cincinnati, OH.

5.2.3.3 Body Weight Loss

If expected site conditions and work requirements have the potential for causing excessive fluid loss, the SSHO shall monitor the workers fluid loss by weighing each worker prior to and again at the conclusion of each days site activities. This will be needed to ensure that proper hydration is being maintained and that the total amount of water weight loss through out the day does not exceed 1.5% of the employee's body weight. Body weights will be taken with the workers wearing undergarments only. If, as determined by the SSHO, site conditions and work requirements cause an extreme amount of fluid loss, body weights will also be taken prior to the lunch break. Calculation of the water weight loss, and assessing the effectiveness of hydration shall be conducted as follows:

1. Subtract the ending weight (W_{ending}) from the daily starting weight (W_{start}) to obtain the weight lost (W_{lost}) for a given work period: (W_{start}) - (W_{ending}) = (W_{lost}).
2. Multiply the starting weight by 1.5% to obtain permissible weight loss (W_{perm}): (W_{start}) x 0.015 = (W_{perm}).
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.

5.2.4 Wet Bulb, Dry Globe Temperature (WBGT) Monitoring

For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 75°F, the SSHO shall conduct WBGT monitoring to assist in controlling the potential for site workers experiencing heat related adverse health affects. The SSHO shall use a real-time direct reading WBGT monitor, and after estimating the work load, use the values expressed in Table 111-2, to determine the work/rest schedule to be implemented. The values outlined in this table are designed such that nearly all acclimatized, fully clothed workers 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 SSHO may also implement the OT and water weight loss monitoring outlined in paragraphs 5.2.3.2 and 5.2.3.3.

Table 111-2. Permissible WBGT Heat Exposure Threshold Limit Values*

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 workers wearing single layer summer type clothing. Use of semi or totally impermeable clothing require monitoring IAW the Physiological Heat Stress Monitoring found in paragraph 5.2.3 of this SOP. As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.

* Source: American Conference of Governmental Industrial Hygienist (ACGIH). 199-1994 Threshold Limit Values and Biological Exposure Indices. Cincinnati, OH.

5.2.5 Heat Stress Documentation

The SSHO shall be responsible for recording all heat stress related information. This will include training sessions, WBGT and physiological monitoring data. Training sessions shall be documented using the EODT Documentation of Training Form. Pulse rate monitoring data will be recorded on the Heat Stress Monitoring Log (see Section 7.0, figure 5-1), with the enviromental conditions, WBGT, OT and/or water loss calculations being recorded in the Site Safety Log, and/or Site Monitoring Log.

6.0 AUDIT CRITERIA

The following items related to operations conducted in hot or cold environments will be audited to ensure compliance with this SOP:

1. The Daily Operational Log;
2. The Site Safety and Monitoring Logs;

3. The Documentation of Training form for the initial site hazard training;
4. The Documentation of Training form for the Daily Tailgate Safety Briefings;
5. The Heat Stress Monitoring Log; and
6. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

The Heat Stress Monitoring Log (Figure 111-1) is attached to this SOP and will be used for documenting the results of pulse rates to assess the physiological affects of heat on exposed personnel.

FIGURE 5-1. HEAT STRESS MONITORING LOG

Date: _____ Site Name: _____ Conditions: _____

SSHO: _____ Location: _____ _____

Name	Organization	Start Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate

Remarks and Observations:

Figure 111-1

STANDARD OPERATING PROCEDURE 112

HEAVY EQUIPMENT OPERATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of heavy equipment.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involved in the conduct of heavy equipment operations. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart O;
- Applicable sections of OSHA General Industry Standard 29 CFR Part 1910, Subpart N; and
- USACE EM 385-1-1, Section 16.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for heavy equipment operations. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are

discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in heavy equipment operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

The operational control techniques to be used during conduct of heavy equipment operations are discussed below:

1. The operation of heavy equipment shall be limited to authorized personnel specifically trained in its operation;
2. A competent person shall visually inspect heavy equipment daily prior to operation, and report any abnormalities/deficiencies to the SSHO;
3. The operator shall use the safety devices provided with the equipment, including seat belts, and backup warning indicators and horns shall be operable at all times;
4. While in operation, all personnel not directly required in the area shall keep a safe distance from the equipment;
5. The operator's cab shall be kept free of all non-essential items and all loose items shall be secured;
6. Personnel shall avoid moving into the path of operating equipment and areas blinded from the operator's vision shall be avoided;
7. Heavy equipment requiring an operator shall not be permitted to run unattended;
8. Except for equipment designed to be serviced while in operation, all equipment shall be shut down and positive means taken to prevent its operation while repair or

servicing is being conducted;

9. All equipment shall be secured at the end of the day, or when not in operation, with the blades/buckets of earth moving equipment placed on the ground;
10. Equipment operated on the highway shall be equipped with turn signals visible from the front and rear;
11. Stationary machinery and equipment shall be placed on a firm foundation and secured before being operated;
12. All points requiring lubrication during operation shall have fittings so located or guarded to be accessible without hazardous exposure;
13. Mobile type equipment, operating within an off-highway job site not open to public traffic, shall have a service brake system and a parking brake system capable of stopping and holding the equipment fully loaded on the grade of operation;
14. Heavy equipment shall be shut down prior to and during fueling operations;
15. All equipment with windshields shall be equipped with powered wipers, and equipment that operates under conditions that cause fogging or frosting of windshields shall be equipped with operable defogging or defrosting devices;
16. Whenever the equipment is parked, the parking brake shall be set, and equipment parked on inclines shall have the wheels chocked or track mechanism blocked and the parking brake set;
17. Personnel shall not work or pass under the buckets or booms of loaders in operation;
18. Each bulldozer, scraper, drag-line, crane, motor grader, front-end loader, mechanical shovel, back hoe, dump truck, and other similar equipment shall be equipped with at least one dry chemical fire extinguisher, having a minimum UL rating of 5-B:C
19. When heavy equipment must negotiate in tight quarters, or if operators of earth moving equipment cannot see the bucket, a secondary person shall be stationed to guide the operator; and
20. Additional riders shall not be allowed on equipment unless it is specifically designed for that purpose (i.e., there is an additional seat with a seat belt).

5.2 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposures associated with heavy equipment operations. These requirements will be implemented unless superseded by site specific requirements stated in the Site Safety and Health Plan.

1. Heavy equipment operators will have received training which addresses the safe operation of the equipment to be used; and
2. Heavy equipment operators shall wear the level of personal protective equipment as specified in the Site-specific Safety and Health Plan.

6.0 AUDIT CRITERIA

The following items related to heavy equipment operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 113

CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the lock out/tagout (LO/TO)of hazardous energy sources.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, and operations involved in the conduct of LO/TO procedures. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926.417;
- OSHA General Industry Standard 29 CFR Part 1910.147; and
- USACE EM 385-1-1, Section 12.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for all operations where personnel may be exposed to the hazards of stored or potential energy. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety

briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in LO/TO operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 PREPARATION FOR SHUTDOWN

The following steps will be conducted prior to the shutdown or isolation of machines or equipment for servicing or maintenance:

1. Lockout and tagout procedures shall be implemented by an authorized personnel only;
2. Authorized personnel shall fully understand the type and magnitude of the energy to be controlled, the means necessary for energy isolation/control, and be able to recognize applicable hazardous energy sources;
3. Prior to maintenance or servicing, the authorized personnel will shut down equipment or machinery by the normal stopping procedure (close valve, open switch, etc.);
4. All sources of hazardous energy will be physically located and the equipment or machine will be deactivated so that the equipment or machine is completely isolated from all energy sources (electrical, hydraulic, pneumatic, etc.);
5. Locks/Tags shall be assigned to each authorized employee by the SSHO, and a LO/TO Device Issuance Log will be maintained by the SSHO (See Figure 1 of Section 7.0); and
6. The authorized personnel conducting the LO/TO will notify all affected personnel in the area that maintenance and servicing is required, and that the equipment or machine must be shut down and locked/tagged out to perform the maintenance or servicing.

5.2 APPLICATION OF LO/TO DEVICES

To ensure the complete control of hazardous energy, the following procedural steps will be followed whenever LO/TO must be conducted;

1. Once all energy sources have been identified, all authorized personnel who will be conducting servicing or maintenance shall affix their own assigned lock and/or tag to the energy controlling devices leading to the equipment or machine;
2. The locks and/or tags will be used to hold these energy controlling devices in a safe or off. position;
3. Stored or residual energy must be dissipated or restrained, as with hydraulic systems, gas, steam, and water pressure, etc., by such methods as blocking and/or bleeding of the stored/residual energy;
4. When the configuration of the controlling device for equipment or machines cannot be secured with a lock, a tag will be used in place of the lock and additional measures will be taken (remove fuses, blocking lines, disconnecting power supply, etc.) to ensure that the status of equipment or machines is in the zero-energy state; and
5. When tagout devices are used instead of lockout devices, they must be applied in such a manner as to provide the same level of personnel protection as would be afforded by a lockout device.

5.3 VERIFICATION OF ISOLATION

5.3.1 All authorized personnel responsible for the LO/TO will witness or individually verify that the equipment or machine is completely de-energized to its full capacity by:

1. Checking to ensure that no employees are exposed;
2. Attempting to energize or activate the equipment of machine using the normal operational control; and
3. Testing to ensure the equipment or machine will not operate.

5.3.2 If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation will be conducted continually until servicing or maintenance has been completed, or the potential for accumulation no linger exists.

5.3.3 After these steps have been accomplished, the authorized person(s) conducting the verification will return the operating controls to the "off" or "neutral" position. Only after these verification steps have been accomplished can the equipment or machinery be considered safe for servicing or maintenance.

5.4 RELEASE FROM OF LO/TO

In order to ensure the safe and effective removal of LO/TO devices, the following steps will be conducted to allow release from LO/TO:

1. The authorized person(s) who conducted the LO/TO will inspect the area in and around the equipment or machine to ensure non-essential items (tools, spare parts, etc.) and all affected employees have been safely positioned or removed;
2. The authorized person(s) will verify that the operating controls are in the "off" or "neutral" position;
3. The authorized person(s) will notify affected personnel in the area that the equipment or machine is to be re-energized;
4. The authorized person(s) who originally placed the LO/TO devices will remove the lock(s) and/or tag(s) from the energy controlling device(s), and re-energize the equipment or machine;
5. The authorized person will notify affected personnel in the area that the equipment or machine is ready for use; and
6. Lock(s) and/or tag(s) shall be returned to the SSHO when the maintenance/servicing task is complete.

5.5 ABSENCE OF THE AUTHORIZED PERSON(S) DURING REMOVAL

5.5.1 These procedures are to be followed whenever the authorized person(s) who placed the LO/TO devices is not on site (sick or vacation) at the time of removal. If the authorized employee is on site, LO/TO device(s) shall be removed only by the person(s) to it was assigned.

5.5.2 In the event that the authorized person(s) cannot be located on site, the SSHO will make all reasonable attempts to ensure that the authorized person(s) is in fact not on site at the time of removal. Once it has been established that the authorized person(s) is not on site, the LO/TO device(s) assigned may then be removed by the Energy Control Coordinator. When the authorized employee returns to the facility, he/she will be informed by the Energy Control Coordinator that the LO/TO devices were removed during his/her absence

5.6 GROUP LO/TO

5.6.1 When equipment or machine maintenance or servicing is performed by a group of individuals, group LO/TO will be utilized to provide for the safety of all affected individuals. Primary responsibility for the safe operation of group LO/TO will be vested in the SSHO, who will conduct the following:

1. Ascertain the exposure status of individual personnel with regard to the lockout or tagout of the equipment or machine; and
2. Will coordinate the affected work forces and ensure continuity of protection.

5.6.2 During operations which involve more than one authorized person, each authorized person will affix their personally assigned LO/TO device to the group lock, group lock box, or comparable mechanism. This will be accomplished when each person begins work and removal

of these LO/To devices shall occur only when work on the equipment or machine has been completed.

5.6.3 Once each individual lock/tag has been affixed and the LO/TO has been verified by the authorized personnel, the normal LO/TO procedures, as outlined in Sections 5.1 thru 5.5, shall be followed.

5.7 SHIFT OR PERSONNEL CHANGE

Specific instruction shall be utilized during shift or personnel changes to ensure the continuity of LO/TO protection, including provision for the orderly transfer of locks or tags between off-going and on-coming employees. This shall be conducted to minimize personal exposure to hazards from the unexpected energizing or start-up of the equipment or machine, or the release of stored energy.

6.0 TRAINING and COMMUNICATION

6.1 TRAINING OF AFFECTED PERSONNEL

Each person working in the are where LO/TO procedures must be implemented shall be instructed in the purpose and use of the LO/TO procedure, and about the prohibitions related to attempts to re-start or re-energize equipment or machinery which are locked or tagged out.

6.2 LOCKOUT TRAINING FOR AUTHORIZED LO/TO PERSONNEL

6.2.1 Each person who will be authorized to conduct LO/TO procedures shall receive training in the following areas prior to using this procedure:

1. The function and purpose of this SOP;
2. Recognition of hazardous energy sources;
3. Types and magnitude of the hazardous energy which may be encountered on site;
4. The means necessary for energy isolation and control;
5. Where tags may be used, training will include procedures for affixing tags and a discussion of the limitations of tagout; and
6. Hands-on practice training with locks and tags prior to implementing LO/TO activities.

6.2 TAGOUT TRAINING FOR AUTHORIZED EMPLOYEES

In the event that only tagout procedures and techniques are used on site, authorized personnel shall be trained in the following limitations of tags:

1. Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock;
2. When a tag is attached to an energy isolating means, it is not to be removed without

authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated;

3. Tags must be legible and understandable by all authorized and affected personnel whose work operations are, or may be, in the area;
4. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidently detached during use; and
5. The importance of the fact that tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered on site..

6.4 EMPLOYEE RETRAINING

Retraining of authorized and affected personnel shall be conducted at least annually to reestablish employee proficiency and to introduce new or revised control methods and procedures. Retraining will also be conducted whenever the periodic inspections, as outlined in Section 8.0 of this SOP reveal inadequacies in the authorized person's knowledge or use of this LO/TO SOP. Also, retraining may be necessary due to changes in job assignments, equipment, machinery, or processes that introduces a new hazard.

7.0 LOCKOUT/TAGOUT MATERIALS AND HARDWARE

All locks, tags, chains, key blocks, or other devices for isolating, securing, blocking, bleeding or isolating energy source shall be provided to the authorized personnel at no charge to these personnel. These devices shall be identified and used solely for the purpose of LO/TO.

7.1 LOCKOUT/TAGOUT DEVICE REQUIREMENTS

All LO/TO devices utilized for protection against unexpected energizing or start up of the equipment or machines, or release of stored energy shall meet the following requirements:

1. LO/TO devices shall be of durable construction capable of withstanding the environment for the maximum period of time these devices are exposed;
2. Tagout devices shall be constructed and printed so that exposure to weather conditions or corrosive environments will not cause the tag to deteriorate or become illegible.
3. LO/TO devices shall be standardized within the facility by color, shape, and/or size, and print and format of tagout devices shall be standardized.
4. Lockout devices will prevent removal without the use of excessive force or unusual techniques, such as bolt cutters or metal cutting tools.
5. Tagout devices, including their means of attachment, shall prevent inadvertent or accidental removal.
6. The material used to attach a tagout device shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being

at least equivalent to a one-piece, environment-tolerant nylon cable tie.

7. Tagout devices shall warn against hazardous conditions if the equipment or machine is energized and shall include a legend such as: DO NOT START; DO NOT OPEN; DO NOT CLOSE; DO NOT ENERGIZE; DO NOT OPERATE, etc.
8. Lockout and tagout devices shall indicate the identity of the employee applying the device(s).

7.2 OTHER PROTECTIVE MATERIALS

Authorized LO/TO personnel will supplied all other protective materials such as blanks, blocks, chains, supports, etc., needed to ensure that all potentially hazardous energy is controlled.

8.0 PERIODIC INSPECTIONS

The SSHO shall conduct periodic inspections of the on site LO/TO procedures at least monthly to ensure that this SOP and its requirements are being followed.

9.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel shall wear and utilized the type and level of PPE outlined in the SSHP or specified by the SSHO when conducting LO/TO operations.

10.0 AUDIT CRITERIA

The following items related to LO/TO operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. Canceled tagout tags;
3. The Lockout/Tagout Issuance Log;
4. The Documentation of Training form for the initial site hazard training;
5. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
6. The Daily Safety Inspection Checklist.

11.0 ATTACHMENTS

Figure 1 attached to this SOP is the Lockout/Tagout Issuance Log, which will be used to record the LO/TO equipment issued to each authorized person.

ISSUE LOG FOR LOCKOUT/TAGOUT DEVICES

LOCK/TAG #	NAME OF AUTHORIZED EMPLOYEE	DESCRIPTION/TYPE OF DEVICE ISSUESD	ISSUED			RETURNED		
			DATE	TIME	BY	DATE	TIME	BY

Figure 1

STANDARD OPERATING PROCEDURE 114

MATERIAL HANDLING AND LIFTING

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving material handling.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involved in the conduct of material handling. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subparts H and N ;
- Applicable sections of OSHA General Industry Standard 29 CFR Part 1910, Subpart H; and
- USACE EM 385-1-1, Section 14.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for operations involving material handling. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in material handling operations, shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFE MATERIAL HANDLING AND LIFTING TECHNIQUES

The safety and health hazards and operational control techniques to be used during conduct of material handling operations are discussed below:

5.1.1 Engineering Controls

Whenever heavy or bulky material is to be moved, the size, shape, weight, distance and path of movement of the object must be considered, and the following hierarchy shall be followed in selecting a means for material handling:

1. Elimination of material handling need through engineering design;
2. Movement of the material by mechanical device (i.e., lift truck, crane etc.);
3. Movement by manual means using mechanical aid (i.e., dolly or cart); and
4. Movement by manual means with protective equipment (i.e.,lifting belt or lifting monitor).

5.1.2 Safe Work Practices

The following fundamentals address the proper manual material lifting procedures:

1. A firm grip on the object is essential, therefore the hands and object shall be free of oil, grease and water, which might prevent a firm grip;
2. The hands, and especially the fingers shall be kept away from any points that cause them to be pinched or crushed, especially when setting the object down;
3. The item shall be inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces and pinch points, and gloves shall be used, if necessary, to protect the hands;
4. The feet shall be placed far enough apart for good balance and stability;
5. Personnel shall ensure that solid footing is available prior to lifting the object;
6. When lifting, get as close to the load as possible, bend the legs at the knees, and keep the back as straight as possible;
7. To lift the object, the legs are straightened from their bending position;
8. Never carry a load that you cannot see over or around;
9. When placing an object down, the stance and position are identical to that for lifting, with the back kept straight and the legs bent at the knees, the object is lowered;
10. If needed, personnel shall be provided with back support devices to aid in preventing back injury during lifting activities;
11. Materials will not be moved over or suspended over personnel unless positive precautions have been made to protect personnel from falling objects; and
12. Where movement of materials may be hazardous to persons, taglines or other devices shall be used to control loads being handled by hoisting equipment.

5.1.3 Two Person Lifting When two or more people are required to handle an object, coordination is essential to ensure that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each person, if possible, shall face the direction in which the object is being carried.

5.2 MATERIAL STORAGE

To ensure the safety and health of site personnel, the general guidelines listed below shall be followed when materials are stored on site. For more detailed guidelines pertaining to the staorage of specific items such as lumber, bricks, pipe, reinforcing steal, etc., consult the references listed in Section 3.0 of this SOP.

1. All materials shall be stored in orderly piles or stacks away from walkways and roadways, and accessways around stored material shall be kept clear;
2. All materials stored in tiers, whether in bags, containers or bundles, shall be stacked, blocked or interlocked and limited in height to ensure the material is stable and to prevent sliding or collapse;

3. Materials shall be stored at a height that is as low as practical and shall not be stored at a height greater than 20 feet;
4. Flammable and combustible materials shall be stored IAW the provisions outlined in SOP 109, Fire Protection and Prevention;
5. All personnel shall be in a safe position while materials are being loaded or unloaded from vehicles;
6. Noncompatable materials shall not be stored together;
7. Reusable lumber shall have all nails withdrawn before being stored;

5.3 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing accidents associated with material handling operations. These requirements will be implemented unless superseded by site specific requirements stated in the Site Safety and Health Plan.

1. When handling materials, proper gloves will be worn to prevent puncture, laceration or abrasion; and
2. Gloves will be selected according to the nature, material and condition of the item(s) to be lifted.

6.0 AUDIT CRITERIA

The following items related to material handling operations will be audited to ensure compliance with this SOP:

1. The Daily Operational Log;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 115

HEARING CONSERVATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the personnel exposure to high noise levels.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, and operations involving noise exposure. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926.59;
- OSHA General Industry Standard 29 CFR Part 1910.95; and
- USACE EM 385-1-1, Section 5.C.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated into site specific plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for operations which involve personnel exposure to high noise sources. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information

related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in high noise operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFETY AND HEALTH HAZARDS

The safety and health hazards associated with the conduct of operations in high noise environments may include the following:

1. Physical trauma to the middle or inner ear, resulting in conductive hearing loss which may cause permanent damage, may heal naturally or may be repaired through surgical techniques;
2. Onset of sensorineural hearing loss caused by the destruction of sound sensing nerves in the inner ear;
3. Interference with voice communication and concentration;
4. Interference with site personnel's ability to detect emergency alarms; and
5. Increase in emotional and physiological stress.

5.2 NOISE EXPOSURE MONITORING

5.2.1 General Requirements

Noise exposure monitoring will be conducted to evaluate the potential for employee exposure to noise levels in excess of those outlined in Table 1. Employees will be given the opportunity to observe any noise measurements conducted and will be informed if they have been exposed to noise at or above the OSHA Action Level. The purpose of work place noise monitoring is to:

1. Collect data to identify noise areas where exposures exceed the OSHA Action Level;

2. Identify affected employees to be included in the Hearing Conservation Program (HCP);
3. Enable proper selection of hearing protection; and
4. Provide data that will assist in the designing of engineering and work practice controls;

5.2.2 Noise Monitoring Procedure

5.2.2.1 The objective of noise monitoring is to identify those operations which may cause personnel to receive an excessive exposure to noise. Typical site operations which have a real potential for causing over exposures are: drill rig operations; brush clearing operations, using gas powered weed eaters, chain saws or brush hogs; and soil excavation and moving operations, involving backhoe, front-end loaders and similar heavy equipment. Whenever sound level or noise dosimetry monitoring is conducted, the monitoring equipment will be used, calibrated and maintained IAW manufacturer's specifications. Sound level and noise dosimetry monitoring data will be recorded on the

5.2.2.2 Operations which have a potential for causing over exposures will be identified in the SSHP. When these operations are initiated, The SSHO will conduct sound level monitoring to determine if noise levels in the hearing zone meet or exceed 85 dBA. If an operation is identified which causes exposures greater than 85 dBA, the SSHO will conduct noise dosimetry monitoring of the personnel working in the area. Continuous noise dosimetry will be conducted for at least 85% of the work shift duration and the SSHO will provide a description of the noise exposure potential for any non-monitored periods during the work shift. The microphone for the noise dosimeter will be positioned in the hearing zone nearest the noise source.

5.2.3 Repeated Exposure Monitoring

Sound level and noise dosimetry monitoring shall be repeated whenever a change in operations, equipment, or protective measures increases noise exposure such that additional employees may be exposed at or above the 85 dBA action level. Monitoring will also be repeated if existing noise protective measures are rendered ineffective.

5.3 OPERATIONAL CONTROL TECHNIQUES

5.3.1 Engineering Controls

Whenever feasible, engineering controls will be utilized to reduce personnel exposure to high noise levels. Typical engineering controls include: reduction in the speed or energy input for vibrating sources; installation of dampening devices to absorb vibration; isolation of site personnel from the noise source, or isolation of the noise source from the work area; and construction of sound absorbing physical barriers between the noise source and the site personnel.

5.3.2 Work Practice Controls

Work practice controls can also be used to reduce personnel exposures and may involve the use of the following: routine maintenance of machinery/equipment; and increasing the distance between personnel and the noise source. At no time is it acceptable to use worker rotation into and out of high noise areas as a method of reducing individual exposure.

5.3.3 Personal Protective Equipment

5.3.3.1 Use of Hearing Protection Devices

Hearing protectors shall be made available to all personnel working in areas where the where exposures to noise are, or may be, equal to or greater than the 85 dBA action level. Hearing protectors will be required, and will be worn by all personnel whose noise exposure exceeds the OSHA PELs listed in Table 5-1 of this SOP. Also, any employees who have experienced an standard threshold shift, as identified by audiogram testing, must use hearing protectors when exposures are at or above the 85 dBA action level.

5.3.3.2 Attenuation of Hearing Protection Devices

All hearing protection devices shall be evaluated by the SSHO for attenuation using the Noise Reduction Rating (NRR) which appears on equipment packaging. Attenuation of hearing protection devices will be calculated using the procedures found in Appendix B of 29 CFR 1910.95. Hearing protector attenuation shall be adequate to reduce exposure to an 8-hour TWA of 90 dBA or less.

5.4 EMPLOYEE TRAINING

Personnel who are exposed to noise levels at or above the 85 dBA action level shall receive initial and annual training. The training shall, at a minimum, include the following:

1. The contents of the OSHA Occupational Noise Exposure Standard and the HCP;
2. The effects of noise on hearing;
3. The purpose of hearing protectors; the advantages, disadvantages, and the attenuation of various types;
4. Instructions on selection, fitting, use, and care of hearing protectors; and
5. The purpose of audiometric testing, and an explanation of the test procedures.

TABLE 1
PERMISSIBLE NOISE EXPOSURE LEVELS

DURATION PER DAY (HRS)	SOUND LEVEL (dBA)
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ (or less)	115

6.0 AUDIT CRITERIA

The following items related to operations involving high noise exposure will be audited to ensure compliance with this SOP:

1. The Site Daily Operational, Safety and Monitoring Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training forms for the Daily Tailgate Safety Briefings; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 117

SANITATION, HOUSE KEEPING AND ILLUMINATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to site sanitation, house keeping and illumination practices.

2.0 SCOPE

This SOP applies to all site operations and personnel, to include subcontractor personnel. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with this SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart D;
- OSHA General Industry Standards 29 CFR Part 1910.120 and 141;
- USACE EM 385-1-1, Section 2.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources required to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is properly implemented, and for assuring safe and sanitary conditions are maintained during site activities. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the daily tailgate safety briefing and that information related to its daily implementation is documented in the Site Operational

Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefing. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

All personnel, including subcontractor personnel, shall be familiar with the work practices and control techniques listed in this SOP which will be used to ensure proper site sanitation, house keeping and illumination.

5.1.1 Potable Water Supply

An adequate supply of potable (drinkable) water shall be provided onsite at all times, and shall be supplied IAW the following provisions:

1. Containers used for potable water shall be capable of being tightly closed, equipped with a tap and maintained in a clean sanitary condition;
2. A container used for distribution of drinking water shall be clearly labeled as to its contents and not used for any other purpose;
3. Water shall not be dipped from the container and use of a common cup shall not be allowed; and
4. Where single service cups are provided, separate sanitary containers shall be provided for the storage of the unused cups and for the disposal of the used cups.

5.1.2 Nonpotable Water

Outlets and storage containers for nonpotable water, such as water for fire fighting or decontamination shall be clearly labeled to indicate that the water is not suitable for drinking, washing or cooking. There shall at no time be a cross connection or open potential between a system furnishing potable water and a system furnishing nonpotable water.

5.1.3 Toilet Facilities

Temporary toilet facilities shall be located at the site, in the SZ. Chemical, recirculating, combustion or flush toilets may be used to fulfill this requirement. Each temporary toilet shall be in good repair, naturally lighted, ventilated, with tight fitting doors, lockable from the inside, and shall be serviced at least weekly.

5.1.3.1 The minimum requirements for toilet facilities can be found in the OSHA standard 29 CFR 1910.120(n). However, to ensure sanitary and adequate facilities, portable toilet facilities will be provided on the basis of one toilet for every ten to fifteen workers assigned to the site

5.1.4 Washing Facilities

Hand and face washing facilities shall be set up in the SZ, and shall be utilized by all personnel exiting the CRZ. As a minimum, disposable handy wipes/baby wipes, and trash receptacles will be made available to allow site personnel to wash exposed skin surfaces after exiting the CRZ.

5.1.5 Site Housekeeping

All work areas shall be maintained in a clean/neat fashion, free of loose debris and scrap. Any materials/equipment not being used shall be removed from the work area and stored or disposed of accordingly. All work areas shall be supplied with a waste receptacle with a tight fitting lid, the contents of which shall be emptied in such a manner as to avoid creating unsanitary conditions. Break rooms and other areas where food is served or consumed shall be supplied with a waste receptacle with a tight fitting lid, which shall be maintained in a sanitary conditions with the contents emptied on a daily basis. To allow for the daily maintenance and inspection of the machinery and heavy equipment on site, a self closing flammable/combustible waste can for oil/solvent soaked rags shall be maintained in areas where maintenance operations occur.

5.2 ILLUMINATION

As a general rule, site personnel will not be permitted to work during the period between thirty minutes before sundown to thirty minutes after sunrise. To ensure that site personnel have the minimum level of lighting needed to perform their tasks, or if site operations must be conducted at night, illumination levels in Table 1 shall be used as the minimum lighting allowed during the conduct of site related activities.

Table 1, Minimum Illumination Levels

Foot-candles	Area of Operation
5	General site area, tunnels, shafts and underground work areas, inside facilities, such as warehouses, hallways, and exitways.

3	Excavation and waste areas, field maint., active storage and fueling areas.
10	General shops, storerooms, dressing and eating areas, maintenance areas.
30	First aid stations, infirmaries and offices.

5.3 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing hazards associated with improper sanitation, illumination and house keeping. These requirements will be implemented unless superseded by site specific requirements stated in the Site Safety and Health Plan.

1. Personnel disposing of medical/biological wastes will, as a minimum, use rubber gloves, and any other PPE deemed necessary by the SSHO;
2. Medical and biological wastes shall be disposed of in bags and containers which are designed and labeled specifically for disposal of such materials;
3. Personnel handling refuse from food handling areas will use rubber/latex gloves when cleaning trash receptacles; and
4. Personnel handling flammable/combustible wastes, shall wear the level and type of PPE prescribed by the SSHO.

6.0 AUDIT CRITERIA

The following items related to site sanitation, illumination and house keeping will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 118

ACCIDENT PREVENTION SIGNS, TAGS AND LABELS

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the need to post signs, tags or labels to inform personnel of site hazards.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involving the need to post site hazards with signs, tags or labels. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926.200;
- OSHA General Industry Standard 29 CFR Part 1910.145; and
- USACE EM 385-1-1, Section 8.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for all operations where safety and health hazards require the posting of signs and labels. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and

that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

5.1.1 General Requirements

An important element of site safety involves providing site personnel with information related to hazardous operations, areas and materials. To ensure effective, consistent communication of these hazards, the following areas and hazards shall be posted with appropriate signs or labels:

1. All site control zones where specific training, medical surveillance or personal protective equipment (PPE) is required for entry will be posted to restrict unauthorized or unqualified personnel from entering the area;
2. All areas where operations are conducted which create the potential for personnel exposure to chemical or physical hazards (i.e., noise, respiratory hazards, etc.) will be posted with signs indicating the type of hazard and the PPE to be worn in the area;
3. Signs, labels, or tags shall be visible at all times when the hazard or problem exists, and shall be removed or covered when the hazard or problem no longer exists;
4. Piping systems shall be identified with color-coded labels to ensure personnel are informed of the contents of the pipes;
5. In the event that radio frequencies present a hazard to personnel, appropriately colored and configured signs will be posted;
6. Containers of hazardous materials, which do not have adequate warning labels, will be labeled LAW the hazard communication requirements found in SOP 106;
7. All site personnel shall be informed as to the meaning of the various signs, tags and labels used throughout the site;
8. The location of first aid and fire protection equipment will be conspicuously posted; and
9. Signs, tags or labels will be used and conspicuously displayed when lock out/tag out

procedures are used for the isolation of hazardous or stored energy.

5.1.2 Color Schemes

For all signs, labels and tags (except piping systems) the following color scheme will apply:

1. Red - Designates dangerous conditions, emergency stop controls, fire detection and suppression equipment and containers of flammable liquids;
2. Orange - Designates dangerous parts of machinery or energized equipment;
3. Yellow - Designates conditions requiring caution, marking dangerous chemicals, marking physical hazards, and markings for ionizing radiation;
4. Green - Designates safety equipment and operator devices, and location of first aid and safety equipment (other than fire fighting equipment); and
5. Blue - Designates information of a non-safety nature.

5.1.3 Selection of Sign, Labels and Tags

In addition to the requirements listed above, the following guidelines will be incorporated in the selection and display of signs, labels and tags:

1. Danger signs shall have the word "DANGER" in white on a black oval background and shall indicate a specific immediate danger, capable of causing irreversible damage or injury and indicates that specific precautions be taken to avoid the danger;
2. Caution signs shall have the word "CAUTION" in yellow on a black background and shall be used to call attention to a specific potential hazards, capable of causing severe but reversible damage or injury, against which proper precautions should be taken;
3. General safety signs shall have key words in white on a green background and shall indicate notices of general practice and rules related to health, first aid, medical equipment, sanitation, housekeeping and general safety; and
4. General information signs shall have the word "NOTICE" in white on a blue background and shall provide general information required to avoid confusion or misunderstanding;

5.2 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel will wear the type and level of PPE specified in the SSHP to prevent or reduce exposures associated with hazardous operations which must be posted with signs.

6.0 AUDIT CRITERIA

The following items related to the posting of signs, labels and tags will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;

STANDARD OPERATING PROCEDURE 119

POWER AND HAND TOOL OPERATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of power and hand tools.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, involved in the conduct of operations involving power and hand tools. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with this SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart I;
- Applicable sections of OSHA General Industry Standard 29 CFR Part 1910, Subpart O; and
- USACE EM 385-1-1, Section 13.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for power and hand tool operations. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in power and hand tool operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFETY AND HEALTH OPERATIONAL CONTROL TECHNIQUES

5.1.1 Power Tools

Power tools have great capability for inflicting serious injury upon personnel if they are not used and maintained properly. To control the hazards associated with power tool operation, the safe work practices listed below shall be observed when using power tools:

1. Operation of power tools shall be conducted by authorized personnel familiar with the tool, its operation, and safety precautions;
2. Power tools shall be inspected prior to use, and defective equipment shall be removed from service until repaired;
3. Power tools designed to accommodate guards shall have such guards properly in place prior to use;
4. Loose fitting clothing or long hair shall not be permitted around moving parts;
5. Hands, feet, etc., shall be kept away from all moving parts;
6. Maintenance and/or adjustments to equipment shall not be conducted while it is in operation or connected to a power source;

7. An adequate operating area shall be provided, allowing sufficient clearance and access for operation;
8. Electrical tools shall be operated IAW the applicable specifications outlined in SOP 105; and
9. Good housekeeping practices shall be followed at all times.

5.1.2 Hand Tools

Use of improper or defective tools can contribute significantly to the occurrence of accidents onsite. Therefore, the work practices listed below shall be observed when using hand tools:

1. Hand tools shall be inspected for defects prior to each use;
2. Defective hand tools shall be removed from service and repaired or properly discarded;
3. Tools shall be selected and used in the manner for which they were designed;
4. Be sure of footing and grip before using any tool;
5. Do not use tools that have split handles, mushroom heads, worn jaws, or other defects;
6. Gloves shall be worn to increase gripping ability and/or if cut, laceration or puncture hazards exist during the use of the tool;
7. Safety glasses or a face shield shall be used if use of tools presents an eye/face hazard;
8. Do not use makeshift tools or other improper tools;
9. When working overhead, tools shall be secured to ensure they cannot fall on someone below;
10. Use non-sparking tools in the presence of explosive vapors, gases, or residue;
11. If hand tools become contaminated they must be properly decontaminated, bagged, marked and held for disposition by COE On-Site Coordinator; and
12. Tools used in the EZ which have porous surfaces, such as wooden or rubber coated handles, shall be discarded as contaminated upon termination of site activities, unless testing can prove the absence of contamination.

5.2 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposures associated with power and hand tool operations. These requirements will be implemented unless superceeded by site specific requirements stated in the Site Safety and Health Plan.

1. Hard hat and steel-toed safety boots shall be worn when working with power or hand tools;
2. Safety glasses with side shields shall be worn at all times when operating, servicing or working around hand or power tools;
3. Hearing protection shall be worn if hand/power tool operation has the potential for noise exposures greater than 85 dBA TWA;

4. Leather, or other similarly protective, gloves shall be worn when using hand/power tools; and
5. Protective face shields shall be sorn for all operations which have the potential for generating flying fragments, objects, chips, particles, etc.

6.0 AUDIT CRITERIA

The following items related to power and hand tool operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 120-D

UXO/OE OPERATIONS - DEMOLITION/DISPOSAL OPERATIONS

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of demolition/disposal operations on sites contaminated with unexploded ordnance (UXO) or ordnance and explosives (OE).

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, involved in the conduct of UXO/OE demolition/disposal operations on a UXO contaminated site. This SOP is not intended to contain all of the requirements needed to ensure complete compliance, and should be used in conjunction with project plans and applicable Federal, state and local regulations. Consult the documents listed in section 3.0 of this SOP for additional compliance issues.

3.0 REGULATORY REFERENCES

Applicable sections and paragraphs in the documents listed below will be used as references for the conduct of UXO demolition/disposal operations:

- EODT Corporate Safety and Health Program;
- OSHA General Industry Standards, 29 CFR 1910;
- OSHA Construction Standards, 29 CFR 1926;
- CEHNC Safety Concepts and Basic Considerations for Unexploded Ordnance;
- USACE EM 385-1-1, Safety and Health Requirements Manual;
- DoD 4145.26-M, Contractor's Safety Manual for Ammunition and Explosives;
- DoD 4160.21-M, Defense Reutilization and Marketing Manual;
- DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards;
- AR 385-64, Ammunition and Explosive Safety;
- AR 385-10, Army Safety Manual;
- DA PAM 385-64, Ammunition and Explosives Safety Standards;
- TM 9-1300-2-6, Ammunition and Explosive Standards;
- TM 9-1300-200, Ammunition General;
- TM 9-1300-214, Military Explosives;
- TM 60A-1-1-31, EOD Disposal Procedures;
- AR 190-11, Physical Security of Arms, Ammunition and Explosives; and
- ATF 5400.7, Alcohol Tobacco and Firearms Explosives Laws and Regulations;

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The EODT Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will be responsible for assuring that adequate safety measures and housekeeping are taken during all phases of site operation, to include demolition activities, and shall visit site demolition locations as deemed necessary to ensure that demolition operations are carried out in a safe, clean, efficient and economical manner.

4.3 DEMOLITION SUPERVISOR

Prior to initiation of demolition operations, the SUXOS shall designate an experienced and trained UXO Supervisor to act as the Demolition Supervisor (DS). The demolition activities shall then be conducted under the direct control of the DS, who will have the responsibility of supervising all demolition operations within the area. The DS shall be responsible for training all on-site UXO personnel regarding the nature of the materials handled, the hazards involved and the precautions necessary. The DS will also ensure that the Daily Operational Log, Ordnance Accountability Log, EODT Demolition Shot Records and inventory records are properly filled and accurately depict the demolition events and demolition material consumption for each day's operations. The DS shall be present during all demolition operations or designate a competent, qualified person to be in charge during any absences.

4.4 SITE SAFETY AND HEALTH OFFICER

The Site Safety and Health Officer (SSHO) for the site is responsible for ensuring that all demolition operations are being conducted in a safe and healthful manner, and is required to be present during all OE demolition operations. The only exception to this rule is when the project site has multiple sites conducting various types of UXO investigation and remediation operations being conducted concurrently with periods where there may be continuous demolition operations throughout the day. In that event a demolition team SSHO will be designated. This individual will report to the SSHO and assume the SSHO's responsibilities at the demolition range. In this situation, the SSHO will conduct periodic safety audits of the demolition team and assist the demolition team SSHO in the performance of his duties.

4.5 QUALITY CONTROL SPECIALIST

The Quality Control Specialist (QCS) is responsible for ensuring the completeness of demolition operations and for weekly inspecting the Ordnance Accountability Log, the Daily Operational Log,

the EODT Demolition Shot Record and the inventory of OE and demolition material. The QCS, assisted by demolition team personnel, will inspect each demolition pit and an area of up to 250 feet in radius after each demolition shot to ensure there are no kickouts, hazardous UXO/OE components or other hazardous items. In addition, the pit will be checked with a magnetometer and large metal fragments four inches or greater, and any hazardous debris will be removed on a per use basis. Any UXO/OE discovered during the QC check will be properly stored for destruction at a later date. Extreme caution must be exercised when handling UXO/OE which has been exposed to the forces of detonation.

5.0 GENERAL OPERATIONAL AND SAFETY PROVISIONS/PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in operations on UXO/OE contaminated sites shall be familiar with the potential safety and health hazards associated with the conduct of demolition/disposal operations, and with the work practices and control techniques used to reduce or eliminate these hazards. During demolition operations, general safety provisions listed below shall be followed by all demolition personnel, at all times. Non-compliance with the general safety provisions listed may result in positive discipline, to include termination of employment:

- All safety regulations applicable to demolition range activities and demolition and OE materials involved shall be complied with.
- Chemical weapons/munitions items will not be destroyed at the demolition range unless special variances and/or permits are issued by both the appropriate regulatory agency and the appropriate command group.
- Demolition of any kind is prohibited without the express permission from the client.
- The quantity of OE to be destroyed will be determined by the range limit, as specified in the DRP.
- In the event of an electrical storm, or heavy snow or dust storms, immediate action will be taken to cease all demolition range operations and evacuate the area.
- In the event of a fire or unplanned explosion, if possible, put out the fire, if unable to do so, notify fire department and evacuate the area. If injuries are involved, remove victims from danger, administer first aid and seek medical attention.
- The DS is responsible for reporting all injuries and accidents which occur to the SSHO.
- Employees will not tamper with any safety devices or protective equipment.
- Any defect or unusual condition noted that is not covered by this attachment will be reported immediately to the DS or SSHO.
- Methods of demolition shall be IAW this procedure and approved changes thereto.
- Adequate fire protection and first aid equipment shall be provided at all times.
- All personnel engaged in the destruction of OE shall wear under and outer garments made of natural fiber, close-weave clothes, such as cotton. Synthetic material such as nylon is not authorized unless treated with anti-static material.
- Care will be taken to minimize exposure to the smallest number of personnel, for the shortest time, to the least amount of hazard, consistent with safe and efficient operations.
- Work locations will be maintained in a neat and orderly condition.
- All hand tools shall be maintained in a good state of repair.
- Each heavy equipment and/or vehicle operator will have in his possession a valid operator's permit, i.e., state driver's license.

- Equipment and other lifting devices designed and used for lifting will have the load rating and date of next inspection marked on them. The load rating will not be exceeded and the equipment will not be used without a current inspection date.
- Leather or leather-palmed gloves will be worn when handling wooden boxes, munitions or UXO/OE.
- Lifting and carrying require care. Improper methods cause unnecessary strains. Observe the following preliminaries before attempting to lift or carry:
  - When lifting, keep your arms and back as straight as possible, bend your knees and lift with your leg muscles; and
  - Be sure you have good footing and hold, and lift with a smooth, even motion.
- The demolition range shall be provided with telephone and/or radio communication.
- Motor vehicles and material handling equipment (MHE) used for transporting OE or demolition materials must meet the following requirements:
  - Exhaust systems shall be kept in good mechanical repair at all times.
  - Lighting systems shall be an integral part of the vehicle.
  - One Class ABC rated, portable fire extinguisher shall, if possible, be mounted on the vehicle outside of the cab, on the driver's side, and one Class ABC fire extinguisher shall be mounted inside the cab.
  - Wheels of carriers must be chocked and brakes set during loading and unloading.
  - No demolition material or OE shall be loaded into or unloaded from, motor vehicles while their motors are running.
- Motor vehicles and MHE used to transport demolition material and OE shall be inspected prior to use to determine that:
  - Fire extinguishers are filled and in good working order.
  - Electrical wiring is in good condition and properly attached.
  - Fuel tank and piping are secure and not leaking.
  - Brakes, steering and safety equipment are in good condition.
  - The exhaust system is not exposed to accumulations of grease, oil, gasoline, or other fuels, and has ample clearance from fuel lines and other combustible materials.
- Employees are required to wear leather or rubber gloves when handling demolition materials. The type of glove worn is dependent on the type of demolition material.
- A red warning flag, such as a "Bravo Flag" or a wind sock, will be displayed at the entrance to the demolition range and, if applicable, the entrance gate shall be locked when demolition work is in process.
- Unless otherwise directed, all demolition shots will be tamped with a minimum of two feet of clean earth/dirt.
- An observer will be stationed at a location where there is a good view of the air and surface approaches to the demolition range before material is detonated. It shall be the responsibility of the observer to order the DS to suspend firing if any aircraft, vehicles or personnel are sighted approaching the general demolition area.
- Two-way radios shall not be operated on the demolition range while the pit is primed or during the priming process. The charts shown in Attachment 1 of this SOP, pages 120D-1-3 and 120D-1-4, have been extrapolated from Tables 2-3 and 2-4 of TM 9-1375-213-12.
- No Demolition operation will he left unattended during the active portion of the operation (i.e., during the burn or once any explosives or UXO/OE are brought to the range).
- A minimum area of 200 feet in diameter shall be cleared of dry grass, leaves and other extraneous combustible materials around the demolition pit area.

- No demolition activities will be conducted if there is less than a 2,000 foot ceiling or if wind velocity is in excess of 20 mph.
- Demolition shots must be fired during daylight hours (i.e., between 30 minutes after sunrise and 30 minutes before sunset).
- No more than two persons shall ride in a truck transporting demolition material or OE, and no person shall be allowed to ride in the trailer/bed.
- Vehicles shall not be refueled when carrying demolition material or OE, and must be 100 feet from magazines or trailers containing such items before refueling.
- All explosive vehicles will be cleaned of visible explosive and other contamination before releasing the vehicles for other tasks.
- Prior to conducting any other task, personnel shall wash their face and hands after handling demolition material or OE.
- Demolition pits shall be spaced at least 50 feet apart, with no more than 10 pits prepared for a series of shots at any one time.

6.0 SPECIAL REQUIREMENTS FOR DEMOLITION ACTIVITIES

The following safety and operational requirements shall be followed during demolition range operations. Any deviations from this procedure shall be allowed only after receipt of written approval from the EODT PM and the client. Failure to adhere to the requirements and procedures listed in the paragraphs below could result in serious injury or death, therefore complete compliance with these requirements procedure will be strictly enforced.

6.1 GENERAL REQUIREMENTS

The general demolition range requirements listed below shall be followed at all times:

- Attachment 1 of this SOP, Explosive Hazards Tables, will be adhered to in all demolition operations.
- Material awaiting destruction shall be stored at not less than intra-line distance, based on the largest quantity involved, from adjacent explosive materials and from explosives being destroyed. The material shall be protected against accidental ignition or explosion from fragments, grass fires, burning embers or detonating impulses originating in materials being destroyed.
- OE or bulk explosives to be destroyed by detonation should be detonated in a pit not less than three feet deep and covered with earth which protrudes not less than two feet above existing ground level. The components should be placed on their sides or in a position to expose the largest area to the influence of the demolition material. The demolition material should be placed in intimate contact with the item to be detonated and held in place by tape or earth packed over the demolition materials. The total quantity to be destroyed below ground at one time shall not exceed the range limit.
- Detonations will be counted to ensure detonation of all pits. After each series of detonations, a search shall be made of the surrounding area for unexploded UXO and OE. Items such as lumps of explosives or unfuzed ammunition, may be picked up and prepared for the next shot. Fuzed ammunition or items which may have internally damaged components will be detonated in place, if possible.

- Prevailing weather condition information will be obtained from the U.S. Weather Service and the data logged in the Demolition Shot Log before each shot or round of shots.
- All shots shall be dual primed.
- A minimum of 30 seconds will be maintained between each detonation.
- After each detonation and at the end of each day's operations, surface exposed scrap metal, casings, fragments, and related items shall be recovered from the demolition range and disposed of IAW contracted procedures, which must be IAW all applicable environmental regulations. All collected scrap metal will be 100% inspected for absence of explosive materials by demolition range personnel and certified by the SUXOS and the QCS.
- When operated in accordance with the conditions of this procedure the demolition range should not present a noise problem to the surrounding community. However, if a noise complaint is received, the name, address and phone number of the complainant should be recorded and reported to the SUXOS, who in turn, will report it to the client.
- Whenever possible, during excavation of the demolition pits, contour the ground so that runoff water is channeled away from the pits. If demolition operations are discontinued for more than two weeks, the pits should be back filled until operations resume.
- Upon completion of the project, all disturbed demolition areas will be thoroughly inspected for OE. Depending upon contract requirements, the site may have to be leveled, seeded and mulched to establish a permanent vegetative cover to inhibit erosion. At a minimum, the holes/pits will be filled in and contoured.
- Prior to and after each shot, the EODT Demolition Shot Record is to be filled out by the DS with all applicable information. This record will be kept with the Ordnance Accountability Log and reflect each shot.

6.2 ELECTRIC DETONATOR USE

The following requirements are necessary when using electric detonators and blasting circuits:

- Electric detonators and electric blasting circuits may be energized to dangerous levels from outside sources such as static electricity, induced electric currents and radio communication equipment. Safety precautions will be taken to reduce the possibility of a premature detonation of the electric detonator and explosive charges of which they form a part. Radios will not be operated while the pit is primed or during the priming process.
- The shunt shall not be removed from the leg wires of the detonator until the continuity check of the detonator.
- When uncoiling or straightening the detonator leg wires, keep the explosive end of the detonator pointing away from the body and away from other personnel. When straightening the leg wires, do not hold the detonator itself, rather hold the detonator leg wires approximately one inch from the detonator body. Straighten the leg wires by hand, do not throw or wave the wires through the air to loosen them.
- Prior to use, the detonators shall be tested for continuity. To conduct the test, place the detonators in a pre-bored hole in the ground or place them in a sand bag, and walk facing away from the detonators and stretch the wires to their full length, or to 25 feet, whichever is less, being sure to not pull the detonators from the hole or sand bag. With the leg wires stretched to their full length, test the continuity of the detonators one at a time by unshunting the leg wires and attaching them to the galvanometer and checking for continuity. After the test, re-shunt the wires by twisting the two ends together. Repeat this process for each detonator until all detonators have been tested. This process shall be accomplished at least

25 feet from any OE or demolition materials and out of the demolition range personnel and vehicle traffic flow pattern. In addition, all personnel on the demolition range shall be alerted prior to the test being conducted.

NOTE: When testing the detonator, prior to connecting the detonator to the firing circuit, the leg wires of the detonator must be shunted by twisting the bare ends of the wires together immediately after testing. The wires shall remain short circuited until time to connect them to the firing line.

- At the power source end of the blasting circuit, the ends of the wires shall be shorted or twisted together (shunted) at all times, except when actually testing the circuit or firing the charge. The connection between the detonator and the circuit firing wires must not be made unless the power end of the firing wires are shorted and grounded or the firing panel is off and locked.
- The firing line will be checked using pre-arranged hand signals or through the use of two-way radios if the demolition pit is not visible from the firing point. If radios are used, communication shall be accomplished a minimum of 25 feet from the demolition pit and detonators. The firing line will be checked for electrical continuity in both the open and closed positions, and will be closed/shunted prior to connecting the detonator leg wires.
- OE to be detonated/vented shall be placed in the demolition pit and the demolition material placed/attached in such a manner as to ensure the total detonation/venting of the OE. Once the OE and demolition material are in place and the shot has been tamped, the detonators will be connected to the firing line. Prior to connecting any firing or detonator leg wires, all personnel involved must be grounded. If possible, this process will be conducted while the detonators are still in the test hole or sand bag. The connected detonators will then be carried to the demolition pit with the end of the detonator pointed away from the individual. The detonators are then connected to the detonation cord, Non-El, etc., ensuring that the detonator is not covered with tamping material to allow for ease of recovery/investigation in the event of a miss-fire.
- Prior to making connections to the blasting machine, the entire firing circuit shall be tested with a galvanometer for electrical continuity and ohmic resistance to ensure the blasting machine has the capacity to initiate the shot.
- The individual assigned to make the connections at the blasting machine or panel will not complete the circuit at the blasting machine or panel and will not give the signal for detonation until satisfied that all personnel in the vicinity have been evacuated to a safe distance. When in use, the blasting machine or its actuating device shall be in the blaster's possession at all times. When using the panel, the switch must be locked in the open position until ready to fire, and the single key must be in the blaster's possession.
- Prior to initiating a demolition shot(s), a warning will be given, the type and duration of such will be determined by the prevailing conditions at the demolition range. At a minimum, this should be an audible signal using a siren, air horn or megaphone which is sounded for a duration of one minute, five minutes prior to the shot(s) and again one minute prior to the shot(s).

6.3 DETONATING CORD USE

The following procedures are required when using detonating cord (det cord):

- Det cord should be cut using approved crimpers and only the amount required should be removed from inventory.

- When cutting det cord, the task should be performed outside the magazine.
- For ease of inventory control, only remove det cord in one foot increments.
- Det cord should not be placed in clothing pockets or around the neck, arm or waist, and should be transported to the demolition location in either an approved "day box" or a cloth satchel, depending upon the magazine location and proximity to the demolition area.
- Det cord should be placed at least ten feet away from detonators and demolition materials until ready for use.
- When ready to "tie in" either the det cord to demolition materials, or det cord to detonator, the det cord will be connected to the demolition material and secured to the UXO/OE. The cord is then strung out of the hole and secured in place with soil, being sure to leave a one foot tail exposed outside the hole.
- Once the hole is filled, make a loop in the det cord that is large enough to accommodate the det cord detonator, place the detonator in the loop and secured it with tape. The explosive end of the detonator will face down the det cord toward the demolition material or parallel to the main line.
- In all cases, ensure there is sufficient det cord extending out of the hole to allow for ease of detonator attachment and detonator inspection/replacement should a misfire occur.
- If the det cord detonators are electric, they will be checked, tied in to the firing line and shunted prior to being taped to the loop. If the det cord detonators are non-electric, the time/safety fuse will be prepared with the igniter in place prior to taping the detonators to the det cord loop. If the det cord detonators are Non-El, simply tape the detonators into the loop as described above.
- In the event that a time/safety fuse is used, and an igniter is not available and a field expedient initiation system is used (i.e., matches), do not split the safety fuse until the detonator is taped into the det cord loop.

6.4 TIME/SAFETY FUSE USE

The following procedures are required when using a time/safety fuse:

- Prior to each daily use, the burn rate for the time/safety fuse must be tested to ensure the accurate determination of the length of time/safety fuse needed to achieve the minimum burn time of five minutes needed to conduct demolition operations.
- To ensure both ends of the time/safety fuse are moisture free, use approved crimpers to cut six inches off the end of the time/safety fuse roll and place the six inch piece in the time/safety fuse container.
- If quantity allows, accurately measure and cut off a six foot long piece of the time/safety fuse from the roll.

Note: In the event of an emergency situation when the quantity time/safety fuse is limited, a minimum of two feet of fuse can be used to conduct the burn rate test.

- Take the six foot section out of the magazine and attach a fuse igniter.
- In a safe location, removed from demolition materials and UXO/OE, ignite the time/safety fuse, measure the burn time from the point of initiation to the "spit" at the end, and record the burn time in the DS's Log
- To measure the burn time, use a watch with a second hand or chronograph.

- To calculate the burn rate in seconds per foot, divide the total burn time (in seconds) by the length (in feet) of the test fuse.
- Whenever using time/safety fuse for demolition operations, the minimum amount of fuse to be used for each shot will be the amount needed to permit a minimum burn time of five minutes.

6.5 PERFORATOR USE

The following procedures are required when using perforators:

- Only remove from inventory the number of perforators required to perform the task.
- Transport perforators in an approved "day box", cloth satchel or plastic container, depending upon magazine location and proximity to the demolition operations.
- Keep perforators stored at the demolition site at least 25 feet away from detonators and demolition materials until ready for use.
- When ready to use, place the det cord through the slot on the perforator and knot the det cord, ensuring the cord fits securely and has good continuity with the perforator.
- Once the det cord is secure, place the perforator in the desired location and secure it in place.
- Proceed from this point as described in para 6.3.

6.6 USE OF TWO-COMPONENT EXPLOSIVES

The following procedures are required when using two-component explosives as demolition material:

- Only remove from inventory the amount of two-component required to perform the task.
- When transporting the solid and liquid, they need only be placed apart in the bed of a truck.
- Do not mix the solid and liquid components until certain that it will be used, since the resulting mixture is classified as a Class 1.1 explosive by DOT.
- When mixing the solid and liquids components, follow the manufacturer's instructions, while being sure to wear rubber gloves and goggles. Mix components in an area away from other demolition materials, the UXO/OE, and if possible, sheltered from the wind.
- Once the components have been mixed, it is essential that the lid to the solid bottle is put on securely as soon as possible after mixing to prevent evaporation of the liquid.
- Attach the det cord as recommended by the manufacturer, place the assembled unit in the desired location in the hole and secure the unit.
- Proceed from this point as described in para 6.3.

6.7 DEMOLITION RANGE INSPECTION SCHEDULE

The demolition range inspection schedule outlined in Table 120D-1 will be followed at all sites where demolition operations are being conducted. This inspection shall be conducted by the SSHO and will be documented in the Site Safety Log. If any deficiencies are noted, demolition operations shall be suspended and the deficiency reported to the SUXOS and DS. Once the deficiencies are corrected, demolition operations may be resumed.

Table 120D-1: Demolition Range Inspection Schedule

Check List Item	Inspection Schedule
Site Vehicle	Weekly or Prior to Use
Explosive Carrier Vehicle	Weekly or Prior to Use
Range Access/Egress Route	Weekly or Prior to Use
Entrance Gate/Lock	Daily, Prior to Use and After Use
Storage Trailer/Magazine	Daily, Prior to Use and After Use
Fire Extinguishers	Monthly and Prior to Use
Personal Protective Equipment	Prior to Use
Circuit Testing Device	Prior to Use
Demolition Site	Prior to Use
Operating Equipment	Prior to Use
Hospital Route	Prior to Use

7.0 METEOROLOGICAL CONDITIONS

In order to control the effects of demolition operations and to ensure the safety of site personnel, the following meteorological limitations and requirements shall apply to demolition operations:

- Demolition operations will not be conducted during electrical storms or thunderstorms.
- Demolition operations shall be restricted to periods when surface wind speed is less than 20 miles per hour.
- Demolition operations will not be conducted during periods of visibility of less than one mile caused by, but not limited to, dense fog, blowing snow, rain, sand or dust storms.
- Demolition shall not be carried out on extremely cloudy days which are defined as: overcast (more than 80% cloud cover) with a ceiling of less than 2,000 feet.
- Demolition operations will not be conducted during any atmospheric inversion condition (low or high altitude).
- Demolition operations will not be conducted during periods of local air quality advisories.
- Demolition operations will not be initiated until 30 minutes after sunrise, and will be secured at least 30 minutes prior to sunset.

8.0 PRE-DEMOLITION/DISPOSAL PROCEDURES

8.1 PRE-DEMO/DISPOSAL OPERATIONAL BRIEFING

It is the belief of EODT that the success of any operation is dependent upon a thorough brief, covering all phases of the task, which is presented to all affected personnel. The DS will brief all personnel involved in range operations in the following areas:

- Type of OE being destroyed.
- Type, placement and quantity of demolition material being used.
- Method of initiation (electric, non-electric or Non-El).
- Means of transporting and packaging OE.
- Route to the disposal site.
- Equipment being used (i.e., galvanometer, blasting machine, firing wire, etc.).
- Misfire procedures.
- Post shot clean up of range.

8.2 PRE-DEMO/DISPOSAL SAFETY BRIEFING

The EODT SSHO will conduct a safety brief for all personnel involved in range operations in the following areas:

- Care and handling of explosive materials.
- Personal hygiene.
- Two man rule and approved exceptions.
- Potential trip/fall hazards.
- Horse play on the range.
- Stay alert for any explosive hazards on the range.
- Location of emergency shelter (if available).
- Parking area for vehicles (vehicles must be positioned for immediate departure, with the keys in the ignition).
- Location of range emergency vehicle (keep engine running).
- Wind direction (to assess potential toxic fumes).
- Location of first aid kit and fire extinguisher.
- Route to nearest hospital or emergency aid station.
- Type of communications in event of an emergency.
- Storage location of demolition materials and OE awaiting disposal.

8.3 TASK ASSIGNMENTS

Individuals with assigned tasks will report the completion of the task to the DS. The types of tasks which may be required are:

- Contact local Police, Fire personnel, USCG and FAA as required.
- Contact hospital/emergency response personnel if applicable.
- Secure all access roads to the range area.
- Visually check range for any unauthorized personnel.
- Check firing wire for continuity and shunt.
- Prepare designated pits as required.
- Check continuity of detonators.
- Check time/safety fuse and its burn rate.
- Designate a technician to maintain custody of blasting machine, fuse igniters or Non-El initiator.
- Secure detonators in a safe location.
- Place UXO/OE in pit and place charge in desired location.

8.4 PREPARING EXPLOSIVE CHARGE FOR INITIATION

To prepare the explosive charge for initiation, the procedures listed below will be followed:

- Insure firing wire is shunted.
- Connect detonator to the firing wire.
- Isolate or insulate all connections.
- Prime the demolition charge.
- Place demolition charge on OE.
- Depart to firing point (if using non electric firing system, obtain head count, pull igniters and depart to designated safe area).
- Obtain a head count.
- Give one minute warning signal, using a bullhorn or siren, five minutes prior to detonation, and again at one minute prior to detonation.
- Yell **"fire in the hole"** three times (or an equivalent warning) and take cover.
- If using electric firing system connect firing wires to blasting machine and initiate charge.
- Remove firing wires from blasting machine and shunt.
- Remain in designated safe area until DS announces **"All Clear"**. This will occur after the DS has gone and inspected the pit(s).

9.0 POST DEMOLITION/DISPOSAL PROCEDURES

Do not approach a smoking hole or allow personnel out of the designated safe area until cleared to do so, and follow the below listed procedures:

- After the "All Clear" signal, check pit for low orders or kick outs.
- Mag pit and remove any large fragmentation.
- Back fill hole as necessary.
- Police up all equipment.
- Notify police, fire, etc. that the operation is complete.

10.0 MISFIRE PROCEDURES

A thorough check of all equipment, firing wire and detonators will prevent most misfires. However, if a misfire does occur, the procedures outlined below shall be followed.

10.1 ELECTRIC MISFIRES

To prevent electric misfires, one technician will be responsible for all electrical wiring in the circuit. If a misfire does occur, it must be cleared with extreme caution, and the responsible technician will investigate and correct the situation, using the steps outlined below:

- Check firing line connections to the blasting machine and make a second attempt to initiate charge.
- If unsuccessful, disconnect and connect to another blasting machine (if available) and attempt to initiate charge.
- If unsuccessful, commence a 30 minute wait period.

- After the wait period has expired the designated technician will proceed down range to inspect the firing system; a safety observer must watch from a protected area.
- Disconnect and shunt the detonator wires, connect a new detonator to the firing circuit and prime the charge without disturbing the original detonator (replacement detonator must have been checked for continuity as outlined in para 6.2, after disconnecting the defective detonator).
- Follow normal procedures for effecting initiation of the charge.

10.2 NON-ELECTRIC MISFIRES

Working on a non electric misfire is the most hazardous of all operations. Occasionally, despite all painstaking efforts, a misfire will occur. Investigation and corrective action should be undertaken only by the technician that placed the charge, using the following procedure:

- If charge fails to detonate at the determined time, initiate a 30 minute wait period plus the time of the safety fuse, i.e., 5 minute safety fuse plus thirty (30) minutes for a total of 35 minute wait period.
- After the wait period has expired, a designated technician will proceed down range to inspect the firing system. A safety observer must watch from a protected area.
- Prime the shot with a new non electric firing system and install a new fuse igniter.
- Follow normal procedures for initiation of the charge.

10.3 NON-EL MISFIRE

The use of a shock tube for blast initiation can present misfires which require the following actions:

- If charge fails to detonate, it could be the result of the shock tube not firing. Visually inspect the shock tube, if it is not discolored (i.e., slightly black), it has not fired.
- If it has not fired, cut a one foot piece off the end of the tube, re-insert the tube in the firing device and attempt to fire again.
- If the device still does not fire, wait 30 minutes and proceed down range to replace the shock tube per instructions outlined below.
- If the tube is slightly black, then a "Black Tube" misfire has occurred, and the shock tube will have to be replaced. When replacing the shock tube, be sure to remove the tube with the detonator in place. Without removing the detonator from the end of the tube, repackage the defective tube and return it to the supplier for credit.

11.0 RECORD KEEPING REQUIREMENT

To document the demolition operations procedures and the completeness of the demolition of OE, the following record keeping requirements shall be met:

- The client or EODT (as directed) will obtain and maintain all required permits.
- The DS will ensure the accurate completion of the logs, and the SUXOS and QCS will monitor the entries in the log for completeness, accuracy and compliance with meteorological conditions.

- The DS shall enter the appropriate data on the Ordnance Accountability Log and the Demolition Shot Record, to reflect the OE destroyed, and shall complete the appropriate information on the Explosives Accountability Log (a.k.a. the Magazine Data Card) which indicates the demolition materials used to destroy the OE.
- The quantities of OE recovered must also be the quantities of OE destroyed or disposed of as scrap.
- EODT will retain a permanent file of all Demolition Records, including permits, Magazine Data Cards, training records, inspector reports, waste manifests if applicable, and operating logs.
- Copies of ATF License and any state or local permits must be on hand.

12.0 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposure to the hazards associated with UXO/OE demolition/disposal operations. These requirements will be implemented unless superseded by site specific requirements stated in the SSHP.

1. Steel-toed safety boots will not be worn by personnel conducting demolition/disposal operations, unless a toe crush hazard exists, in which case personnel will wear boots with plastic or fiber toed safety toes;
2. Unless a serious head, eye or face hazard exists, UXO personnel will not be required to wear hard hats, safety glasses or face shields when conducting operations involving the handling of demolition explosives or UXO/OE; and
3. In the event that a serious head, eye or face hazard does exist, UXO personnel will wear the required PPE, but positive means shall be required to secure the PPE and prevent it from falling and causing an accidental detonation.

13.0 AUDIT CRITERIA

The following items related to demolition/disposal operations on a UXO/OE contaminated site will be audited to ensure compliance with this SOP:

1. The EODT Demolition Shot Record
2. The Site Daily Operational and Safety Logs;
3. The OE Operations Daily/Weekly Report;
4. The Safety Training Attendance Forms, for the initial site hazard training;
5. The Safety Training Attendance Forms, for the Daily Tailgate Safety Briefings;
6. The Daily Safety Inspection and Audit Log.

14.0 ATTACHMENTS

The following attachment to this SOP will be reviewed by all UXO-qualified personnel participating in demolition/disposal activities.

Attachment 1 ..... Explosive Hazards Tables

ATTACHMENT 1

TO STANDARD OPERATING PROCEDURE 120D

EXPLOSIVE HAZARDS TABLES

INTRODUCTION

The following tables are to be used during demolition operations, and will be used to calculate minimum safe distances as they relate to fragmentation range, mobile RF, television and FM broadcasting transmitters. Table 1 is to be utilized when computing fragmentation ranges. It is essential when computing the explosive weight, that you include the explosive weight of the demolition/counter charge, propellant, etc. If you have a fraction of any kind, i.e. 1 pound, 12 ounces, you go to the next highest weight to compute fragmentation range.

The fragmentation ranges are for open, unbarricaded shots. If there is a protective shelter with overhead protection, you may be closer to the shot. However, every effort will be made to adhere to the appropriate fragmentation range regardless of shelter or depth the shot is buried.

If you are using multiple pits you must insure that all pits are within the appropriate fragmentation range. If this is not possible, you may consider detonating smaller quantities in the outer pits to be in compliance. At no time will you violate the fragmentation range without the written approval of the client.

Tables 2 and 3 are for determining the minimum safe distances between different types of radio and television transmitters when electric detonators are in use.

TABLE 120D-1-1:COMPUTATION OF FRAGMENTATION RANGES

Explosive Weight [a]	Frag Range [b]	Explosive Weight	Frag Range	Explosive Weight	Frag Range	Explosive Weight	Frag Range
1	330	16	832	31	1037	46	1182
2	416	17	849	32	1048	47	1191
3	476	18	865	33	1058	48	1199
4	524	19	881	34	1069	49	1208
5	564	20	896	35	1079	50	1214
6	598	21	910	36	1090	75	1392
7	631	22	925	37	1100	100	1532
8	660	23	938	38	1110	150	1752
9	686	24	952	39	1119	200	1931
10	710	25	965	40	1129	250	2079
11	734	26	978	41	1138	300	2208
12	756	27	990	42	1147	350	2327
13	776	28	1002	43	1156	400	2432
14	795	29	1024	44	1165	450	2528
15	814	30	1025	45	1174	500	2620

NOTE: For the purpose of computing fragmentation range, consider all explosives, including those used to counter charge, propellant, etc, when determining the total explosive weight.

a - Weight in pounds
b - Distance in feet

Formula: 100 X Cube Root of Explosive Weight = Frag Range in Meters.

NOTE: To convert feet to meters, use: Feet X 0.305 = Meters.
To convert meters to feet, use: Meters X 3.28 = Feet

TABLE 120D-1-2:
MINIMUM SAFE DISTANCE BETWEEN MOBILE RF TRANSMITTERS AND ELECTRIC BLASTING OPERATIONS

MINIMUM SAFE DISTANCE (FEET)					
Transmitter Power (Watts)	MF 1.6 to 3.4 MHZ Industrial	HF 28 to 29.7 MHZ Amateur	VHF 35 to 36 MHZ Pub. Use 42 to 44 MHZ Pub. Use 50 to 64 MHZ Amateur	VHF 144 to 148 MHZ Amateur 150.8 to 161.6 MHZ Public Use	UHF 450 to 460 MHZ Public Use
5 [1]					
10	40	100	40	15	10
50	90	220	90	35	20
100	125	310	130	50	30
180 [2]				65	40
250	200	490	205	75	45
500 [3]			290		
600 [4]	300	760	315	115	70
1,000 [5]	400	980	410	150	90
10,000 [6]	1,250		1,300		

1 Citizens band radio (Walkie-Talkie) (26.96 to 27.23 MHZ) - Minimum safe distance - five feet.)
2 Maximum power for 2-way mobile units in VHF (150.8 to 161.6 MHZ range) and for 2-way mobile and fixed station units in UHF (450 to 460 MHZ range).
3 Maximum power for major VHF 2-way mobile and fixed station units in 35 to 44 MHZ range.
4 Maximum power for 2-way fixed station units in VHF (150.8 to 161.6 MHZ range).
5 Maximum power for amateur radio mobile units.
6 Maximum power for some base stations in 42 to 44 MHZ band and 1.6 to 1.8 MHZ band.

NOTE: To convert feet to meters, use: Feet X 0.305 = Meters.
To convert meters to feet, use: Meters X 3.28 = Feet

TABLE 120D-1-3: MINIMUM SAFE DISTANCE BETWEEN TV AND FM BROADCASTING TRANSMITTERS AND ELECTRIC BLASTING OPERATIONS

Effective radiative power (watts)	Minimum safe distances (feet)		
	Channels 2 to 6 and FM	Channels 7 to 13	UHF
up to 1,000	1,000	750	600
10,000	1,800	1,300	600
100,000 [1]	3,200	2,300	1,100
316,000 [2]	4,300	3,000	1,450
1,000,000	5,800	4,000	2,000
5,000,000 [3]	9,000	6,200	3,000
10,000,000	10,200	7,400	3,500
100,000,000			6,000

1 Present maximum power, Channels 2 and 6 and FM.

2 Present maximum power, Channels 7 and 13.

3 Present maximum power, Channels 14 to 83.

STANDARD OPERATING PROCEDURE 120-E

UXO/OE OPERATIONS - EXPLOSIVES ACQUISITION, STORAGE, ACCOUNTABILITY AND TRANSPORT

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the acquisition, storage, accountability and transport of explosives and unexploded ordnance (UXO) or ordnance and explosives (OE) waste.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, involved in the conduct of operations on a site with UXO contamination. This SOP is not intended to contain all requirements needed to ensure compliance. Consult the documents listed in section 3.0 of this SOP for additional compliance issues.

3.0 REGULATORY REFERENCES

Procedures and information contained in this document were obtained from the below listed references:

- CEHNC Safety Concepts and Basic Considerations for UXO;
- EODT Corporate Safety and Health Program (CSHP);
- OSHA, 29 CFR 1910, Occupational Safety and Health Standards;
- OSHA, 29 CFR 1926, Construction Standards;
- Applicable sections of DOT, 49 CFR Parts 100 to 199, Transportation;
- ATF P 5400.7, ATF-Explosives Law and Regulations;
- CEHNC EM 385-1-1, Safety and Health Requirements Manual;
- DoD 4145.26-M, Contractors' Safety Manual for Ammunition and Explosives;
- DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards;
- DA PAM 385-64, Ammunition and Explosives Safety Standards;
- AR 385-64, Ammunition and Explosives Safety Standards;
- AR 385-10, The Army Safety Program;
- AR 385-16, System Safety Engineering and Management;
- AR 385-40 w/USACE Supplement, Accident Reporting and Records;
- TM 9-1300-200, Ammunition General;
- TM 9-1300-206, Military Explosives.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM), in conjunction with the Senior UXO Supervisor (SUXOS), is responsible for the initial quantity and type of demolition material ordered. The initial requisition should be of sufficient quantity to support the project for a 90-day period. In the event the project is scheduled to run for less than 90 days, only one requisition will be made, if possible.

4.2 SENIOR UXO SUPERVISOR

The SUXOS will be responsible for all subsequent requisitions for demolition materials. He will accomplish this by submitting a purchase order (PO) request through the PM, who approves it and forwards it to accounting for the preparation of a PO. Accounting then forwards the PO to the Program Administrator for action.

5.0 REQUISITION PROCEDURES

The requisition of explosives will be IAW EODT policy, which requires that three quotes be obtained to ensure the best possible price for the task. Of paramount importance in this process is the determination of the location of the supplier(s). Generally, response time to requisitions is better for those suppliers closest to the site. Additionally, there is the possibility of leasing explosives magazines from the supplier.

6.0 LICENSE/PERMIT

6.1 FEDERAL LICENSE

In order to requisition explosives, EODT must have a valid BATF license/permit (See Figure 120E-1) on hand to include an Authorization List (See Figure 120E-2) for the receipt of explosives. These two documents must be on file at EODT with the Director of Operations and each explosive supplier must also have a copy of each in order to sell to EODT. A copy of the ATF license and an authorization list for the project site will be maintained at the site.

6.2 STATE BLASTERS LICENSE

In some instances, it will be necessary for one or more UXO technicians to obtain a State Blasters License from the state in which the project is located. This is accomplished by contacting the State Fire Marshall or Safety Office to determine the requirements and schedule for the test. Only those individuals licensed by the State may actually shoot the shot.

6.3 STATE/COUNTY PERMITS

In some instances, it is necessary to obtain a state or county permit to conduct OB/OD. This is accomplished by contacting the State Fire Marshall or County Fire Department for instructions.

7.0 EXPLOSIVES RECEIPT

Only those individuals named on the Authorization list may sign for explosives from the shipper. In order to ensure the quantity shipped is the same as the quantity listed on the shipping documents, two EODT personnel will inventory the shipment prior to signing for it.

7.1 SHIPPING DOCUMENTS

Explosive shipments generally are accompanied by the explosive suppliers Bill of Lading (B/L) (see Figure 120E-3) and the freight companies shipping document (see Figure 120E-4). The initial inventory will include reconciling the two documents with the actual shipment. Regardless of the outcome of the initial inventory, one copy of the B/L and the freight company shipping document will be attached to a copy of the PO request and the PO. One copy of each of the four documents will be kept on file on site and one complete copy forwarded to the corporate office.

7.2 RECEIPT DISCREPANCIES

In the event there is a discrepancy between the amount shipped and the amount received, the SUXOS will immediately contact the explosive supplier and inform him of the discrepancy. It then is the responsibility of the supplier and shipper to rectify the situation and inform EODT of the results. The supplier and/or shipper must then correct their documents and forward same to the site. In any event, only the amount received will be entered on the Explosives Accountability Record/Magazine Data Card (See Figure 120E-5).

8.0 EXPLOSIVES STORAGE

Demolition operations require the availability and storage of explosive demolition materials. To the maximum extent possible, local government or existing facilities will be used. Existing facilities are desirable due to their low cost and pre-approval, negating transport and set up. EODT will comply with local storage procedures when using Government facilities. When required to provide explosive storage, EODT will:

- Use approved ATF Type 2 outside storage structures or government furnished magazines;
- Locate, install, and maintain the magazines to comply with the magazine criteria and quantity distance requirements established in DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards;
- Install a lightning arrestor system and have it checked by an electrician for specification conformance;

- Establish security, such as fencing and lighting, to prevent unauthorized access and theft.

8.1 MAGAZINES

Generally, Type 2 outdoor magazines will be used, which will consist of a box, trailer, semi-trailer or other mobile facility. It is bullet, fire, weather, theft-resistant and must be well ventilated. The ground around outdoor magazines must slope away for drainage or other adequate drainage provided. When unattended, vehicular magazines must have wheels removed or otherwise effectively be immobilized by using pin locking devices.

8.1.1 Exterior Construction

The exterior and doors are to be of not less than ¼ inch steel and lined with at least two inches of hardwood. Magazines with top openings will have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

8.1.2 Hinges and Hasps

Hinges and hasps will be attached to doors by welding, riveting or bolting (nuts on inside of door). Hinges and hasps will be installed so they cannot be removed when the doors are closed and locked.

8.1.3 Locks

Each door will be equipped with two padlocks fastened in separate hasps and staples. Padlocks must have at least five tumblers or five blades and a case-hardened shackle of at least ⅜ inch diameter. Padlocks will be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples.

8.1.4 Signage/Placarding

ATF and DoD require that all magazines be appropriately posted for content hazard class, fire fighting hazard and an emergency notification list. Magazines will be placarded IAW DoD 4145.26M and TM9-1300-206. In most instances, this will require a Fire Division Class 1 for the recovered UXO magazines and a Fire Division Class 3 for the demolition material, excluding detonators, which are Fire Division Class 4. If in doubt and unable to obtain guidance from a reputable source, label the contents with the next highest hazard. In the event you have two fire division or hazard class items in the same magazine, use the higher hazard division/class placard.

Note

Emergency Notification List: An emergency notification list containing the name, telephone number and local address of the individuals to be notified in the event of an emergency, will be posted on the outside and inside of the magazine door. These individuals should be the same individuals authorized to sign for explosives.

8.1.5 Compatibility

Explosive compatibility will be maintained IAW DoD 4145.26M and TM9-1300-206. Table No. 1 lists the various storage compatibility groups and Table No. 2 is the compatibility chart. In certain instances, it may be necessary to store incompatible items in the same magazine. If this should occur, then the incompatible items will be physically separated by a barricade, such as sandbags, within the magazine. This situation should be an interim occurrence and avoided it at all possible.

8.1.6 Key Control

Magazines will remain locked except when receipts and issues are being made. The two locks on the magazines will require two different keys to unlock. One key will be kept by the SUXOS and the second key by the Ordnance Accountability Officer (OAO). This procedure ensures that access to the magazines cannot be made without obtaining the two keys and no one individual can gain access to the magazines.

9.0 EXPLOSIVES ACCOUNTABILITY

Upon receipt and verification of explosive demolition material, the magazine data card is filled out as shown in Figure No. 5 and kept in the magazine on top of the listed item. A duplicate copy is maintained by the OAO, who is either the SSHO or QCS.

9.1 USAGE INVENTORY

Following each occurrence of a receipt or issue of explosive material, the OAO will conduct a joint inventory in conjunction with the demo team leader, drawing out or returning the explosives. Only those items issued/returned will be inventoried. The OAO will appropriately annotate the two sets of magazine data cards.

9.2 WEEKLY INVENTORY

The last day of each work week, the SUXOS, the OAO and a third individual (who will be changed each week) will conduct an inventory and record results on the two sets of magazine data cards.

9.3 DISCREPANCIES

In the event there is a discrepancy during any inventory, the item will be recounted a minimum of two additional times. If a discrepancy still exists, the EODT PM, CEHNC CO/COR and BATF will be notified. All actions from this point will be dictated by BATF.

10.0 EXPLOSIVES AND OE TRANSPORTATION REQUIREMENTS

Transportation of OE and explosives will comply with all Federal, state, and local regulations. Permits are not required under CERCLA for on-site or on Federal installation transportation of explosives or OE. Off-site shipment of OE will be made using commercial carriers approved to transport ammunition and explosives. For off-site shipment:

- OE will be packaged IAW 49 CFR part 173, if possible;
- Drivers will be provided DD form 836(Special Instructions for Motor Vehicle Drivers);
- Vehicles will be inspected using DD form 626, Motor Vehicle Inspection, and be properly placarded;
- Compatibility requirements will be observed;
- The load shall be well braced and, except when in closed vans, covered with a fire-resistant tarpaulin.

10.1 FEDERAL INSTALLATIONS/ON-SITE

Transportation of explosives and OE on-site and on Federal installations will comply with the following:

- Vehicles will be inspected per occurrence, using EODT Weekly Vehicle Inspection Checklists and will be properly placarded;

- Explosives will be transported in closed vehicles whenever possible. When using an open vehicle, explosives will be covered with a flame resistant tarpaulin (except when loading/unloading);
- Vehicle engine will not be running. Wheel chokes and brakes set when loading/unloading explosives;
- Beds of vehicles will have either a plastic bed liner, dunnage, or sand bags to protect the explosives from contact with the metal bed and fittings;
- Vehicles transporting explosives will have a first aid kit, two 10 BC rated fire extinguishers, and communications capabilities;
- Initiating explosives, such as detonators, will remain separated at all times;
- Compatibility requirements will be observed;
- Operators transporting explosives will have a valid drivers license; and
- Drivers will comply with posted speed limits, but will not exceed a safe and reasonable speed for conditions. Vehicles transporting explosives off-road will not exceed 25 mph.

TABLE 120E-1

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION

GROUP A

Cyclonite (RDX), dry
HMX, dry
Lead azide, wet
Lead styphnate, wet
Mercury fulminate, wet
PETN, dry
RDX (cyclonite), dry
Tetracene, wet

GROUP B

Detonators
Fuses (except chemically-actuated fuses containing ampules which may initiate, directly or indirectly, explosives and explosives-loaded components which are assembled in the conventional manner to form the finished explosive fuse).
Mines, practice, AP, M17
Percussion elements
Primer detonators

GROUP C

Ammunition, blank and saluting, cannon
Ammunition, .50 caliber, except API and incendiary rounds
Ammunition, 20mm, practice and high pressure test
Ammunition, 25mm, with inert projectile
Ammunition, 27mm, caseless
Ammunition, 30mm, ball and high pressure test
Ammunition, 30mm, practice and training
Ammunition, 37mm and 40mm, TP and AP
Ammunition, 40mm, practice, M407A1, M382, and M385
Benite
Baron potassium nitrate
Cartridge, 90mm, canister, AP
Cartridges, practice, over 40mm
Catapults, aircraft ejection seat, M3A1, M4A1, M5
Charge, propelling, not assembled to projectiles EC powder

Detonating cord (primacord)
Nitrocellulose
Fuel (solid), emergency power unit
Propellant
Rockets, practice, 3.5-inch
Rocket motors, M3, M5, M6, M10, M13, M26, M30, M37, M42, M53, M66; Pershing 1st and 2nd stages; Spartan 1st, 2nd, and 3rd stages

GROUP D

Adapter booster
Ammonium nitrate, except in original shipping container or equivalent
Ammonium perchlorate, except when particle size is over 15 microns and in original shipping container or equivalent
Ammonium picrate (Explosive D)
Bangalore torpedoes
Baratol
Black powder, bulk
Bombs, demolition
Bombs, fragmentation
Bombs, general purpose
Boosters
Boosters, auxiliary
Bursters
Charge, demolition, snake
Charge, springing earth rod, blast driven
Charge, supplementary, HE
Compositions A, A-2, A-3, A-4, B, B-3, C, C-2, C-3, and C-4
Cutter, cable M1
Cyclonite (RDX), wet
Cyclotol
Demolition Blocks
Destructor, HE, M10
Detonating cord (primacord) exposed to detonation hazard at less than intra line distance
Dynamite
Ednatol
Explosive D
Explosives, cratering
Grenades, rifle, AT (except pentolite loaded)
HMX, wet

Mine, APERS, MN, M14 (w/integral fuse)
Mines, antipersonnel (bounding type)
Mines, antipersonnel (cast iron block)
Mines, HEAT
Nitrocellulose wet 8-30% water exposed to detonation hazards at less than intra line distance
Nitroguanidine
Nitrostarch
Octol
PBX
pentolite
PETN, wet
Picratol
Picric acid
Projectiles, HE, fuzed or unfused
RDX (Cyclonite), wet
Rocket heads, HE and HEAT (except pentolite loaded) w/o motors
Shaped charges
Tetranitrocarbazole (TNC)
Tetryl
Tetrytol
TNT
Tritonal
Torpex

GROUP E
Ammunition, HEP
Ammunition, 20mm, HE, HEI and functional packs containing HE and HEI
Ammunition, 30mm, HEDP
Ammunition, 37mm, HE
Ammunition, 40mm, HE, RDX loaded
Ammunition, 40mm, HE, M406, M386, M441, and M463
Ammunition, 57mm through 81mm, except WP smoke, HEP and blank
Ammunition, fixed and semifixed, 90mm through 106mm, loaded with ammonal, amatol, Explosive D, composition B or TNT
Cartridge, heavy mortar, over 81mm (including 81mm M56), except chemical loaded
Cartridge, light mortar, 81mm or less (excluding 81mm M56), except chemical loaded
Redeye guided missiles, packaged 3 complete rounds w/launcher
Rockets, HEAT, 3.5-inch, complete round
Rockets, HE, 2.75-inch (in LAU-3/A rocket launcher)

GROUP F

Grenades, hand offensive

Grenades, fragmentation

GROUP G

Ammunition, .50 caliber API and incendiary

Ammunition, 20mm, API

Ammunition, 20mm, incendiary and functional packs containing incendiary, except those containing HE or HEI

Ammunition, 40mm, riot control and pyrotechnic loaded, except WP smoke

Bombs, photoflash

Cartridge, igniter, M2

Cartridge, illuminating

Cartridge, photoflash

Cartridge cases, primer (w/o propellant)

Charge, igniter assembly, for practice hand grenades

Charge, spotting, APR practice, M8

Chemical ammunition, Group B, tear or smoke producing, w/explosive components, over 40mm

Chemical ammunition, Group B, tear or smoke producing, w/o explosive components

Chemical ammunition, Group D, containing flammable solids, except for TEA or TPA, w/o explosive components

Chemical ammunition, Group D, fixed or semi-fixed rounds, containing flammable solids, except for TEA or TPA

Clusters, incendiary bomb, M31 and M32 (w/o fuzing components)

Destroyer, file, M4

Detonation, simulator, explosive M80

Grenade, hand, smoke, HC, M8

Grenades, hand, CN, M7A1, w/fuse M201A1

Grenades, hand, CS, M7A3, w/fuse M210A1

Grenades, hand, CN1, ABC, M25A1, w/fuse C12

Grenades, hand, CM1, ABC, M25A2, w/fuse C12

Grenades, illuminating and incendiary

Grenades, practice, w/spotting charge

Grenades, rifle, smoke, XM48E1 and M22 and M23

Grenades, smoke (except WP and PWP)

Grenades, riot control, CS1, M25A2

Igniter, spotting charge

Igniters for rocket motors (e.g., M12, M18, M20 and M29)

Ignition cartridge for trench mortar ammunition

Illuminating compositions (consolidated in final press operations)
mines, practice, w/spotting charge and/or fuse
Nuclear fire marker device 11-F2
Photoflash powder
primers, artillery and cannon, percussion and electric
Projectiles, illuminating
Rocket, riot control agent, CS, 2.75-inch FFAR, MX99
Simulators, M110, M115, M116, M117, M118, M119 and XM142
Smoke pots
Spotting charges (cartridge for miniature practice bombs)

GROUP H

Chemical ammunition, Group C
Grenades, WP
Grenade rifle, WP, M19

GROUP J

Chemical ammunition, Group D, containing flammable liquids or gels, with or w/o explosive components
Chemical ammunition, Group D, fixed and semifixed rounds, containing flammable liquids or gels with or without explosive components

GROUP K

Chemical ammunition, Group A, with or without explosive components
Chemical ammunition, Group B, with or without explosive components, designed for toxic or incapacitating effects greater than lachrymation
Rockets, toxic chemical agents, complete rounds

GROUP L

Aluminum powder
Ammonium nitrate
Ammonium perchlorate
Ammunition, pentolite loaded
Chemical Ammunition, Group A, without explosive components
Chemical ammunition, Group B, without explosive components, designed for toxic or incapacitating effects more severe than lachrymation
Chemical ammunition, Group D, TEA or TPA components
Chlorates
DNT

Fuzes, chemically-actuated, containing ampoules which may initiate directly or indirectly, explosives and explosives loaded components which are assembled in the conventional manner to form the finished explosive fuse
Magnesium powder
Grenades, rifle, AT (pentolite loaded)
Nitrates (inorganic), except ammonium nitrate (in original shipping container or equivalent)
Perchlorates
Peroxides, solid
Rocket heads, pentolite loaded, w/o motors
Zirconium (types I and II, spec. FED 1665)

GROUP S
Ammunition, 40mm, canister and multiple projectile
Ammunition, small arms, less than .50 caliber
Explosive bellows
Firing devices
Fuse lighters
Fuse safety
Squibs commercial

TABLE 120E-2: STORAGE COMPATIBILITY CHART

GROUPS	A	B	C	D	E	F	G	H	J	K	L	S
A	X	Z										Z
B	Z	X										X
C			X	Z	Z		Z					X
D			Z	X	X							X
E			Z	X	X							X
F						X						X
G			Z				X					X
H								X				X
J									X			X
K										X	U	
L										U		
S	Z	X	X	X	X	X	X	X	X			X

Note:

1. The marking "X" at an intersection of the above chart indicates that these groups may be combined in storage. Otherwise, mixing is either prohibited or restricted per Note 2 below.
2. The marking "Z" at an intersection of the above chart indicates that, when warranted by operational considerations or magazine non-availability, and when safety is not sacrificed, these groups may be combined in storage.
3. Equal numbers of separately packaged components of complete rounds of any single type of ammunition may be stored together. When so stored, compatibility is that of the assembled rounds; i.e., WP Filler in Group H, HE Filler in Groups D, E, or F, as appropriate.
4. Group K required not only separate storage from other groups, but also requires that munitions having different toxic chemical agent fillers be stored separately from each other.
5. The marking "U" on above chart indicates that leaking toxic chemical munitions of one agent type, i.e., GB, with or without explosive components, may be stored together in one magazine specifically designated for storage of leakers of that agent type.
6. Ammunition designated "PRACTICE" by NSN and nomenclature may be stored with the fully loaded ammunition it simulates.

11.0 AUDIT CRITERIA

The following items related to explosives acquisition, storage, accountability and transport will be audited to ensure compliance with this SOP:

1. The EODT Demolition Shot Record
2. The Site Daily Operational and Safety Logs;
3. The OE Operations Daily/Weekly Report;
4. The Safety Training Attendance Forms, for the initial site hazard training;
5. The Safety Training Attendance Forms, for the Daily Tailgate Safety Briefings;
6. The Daily Safety Inspection and Audit Log; and
7. The EODT Explosives and Accountability Log.

FIGURE 120E-1: BATF LICENSE/PERMIT

DEPARTMENT OF THE TREASURY—BUREAU OF ALCOHOL, TOBACCO AND FIREARMS

LICENSE/PERMIT (18 U.S.C. CHAPTER 40, EXPLOSIVES)

In accordance with the provision of Title XI, Organized Crime Control Act of 1970, and the regulations issued thereunder (27 CFR Part 55), you may engage in the activity specified in this license/permit within the limitation of Chapter 40, Title 18, United States Code and the regulations issued thereunder, until the expiration date shown. See "WARNING" and "NOTICE" on back.

DIRECT ATF CORRESPONDENCE TO	CHIEF, F & E LICENSING CENTER BATF, P.O. BOX 2994 ATLANTA, GA 30301-2994	LICENSE/ PERMIT NUMBER	1-TN-001-33-7H-97374
		EXPIRATION DATE	AUGUST 1, 1997
NAME	LICENSED PREMISES: EOD TECHNOLOGY, INC		10511 HARDIN VALLEY RD BLDG C KNOXVILLE, TN 37932
TYPE OF LICENSE OR PERMIT	33 - USER OF HIGH EXPLOSIVES		
CHIEF, F & E LICENSING CENTER	Doug A Haynes		

PURCHASING CERTIFICATION

I certify that this is a true copy of a license/permit issued to me to engage in the activity specified

(SIGNATURE OF LICENSEE/PERMITTEE)

LICENSEE OR PERMITTEE MAILING ADDRESS

EOD TECHNOLOGY, INC
10511 HARDIN VALLEY RD
BLDG C
KNOXVILLE, TN
37932

The licensee/permittee named herein shall use a reproduction of this license/permit to assist a transferor of explosives to verify the identity and status of the licensee/permittee as provided in 27 CFR Part 55. The signature on each reproduction must be an ORIGINAL signature.

ATF F 5400.14/5400.15, Part 1 (8/89)

FIGURE 120E-2: AUTHORIZATION LIST

EODT EXPLOSIVES PURCHASE/RECEIPT AUTHORIZATION LIST

Address and County: _____

_____

Federal License #: _____ Expiration Date: _____

The following persons are agents, employees, or representatives of the undersigned, and are authorized to order or acquire explosive materials on behalf of EOD TECHNOLOGY, INC.:

Name and Home Address	Driver's License No.	Soc. Sec. Number	Place of Birth

The undersigned certifies the foregoing information to be true and correct to the best of his knowledge and belief, and that he will communicate any additions or deletions to the foregoing list to EOD Technology, Inc.

_____	_____
Corporate Officer	Date

FIGURE 120E-3: BILL OF LADING

IN CASE OF EMERGENCY INVOLVING THIS SHIPMENT, CONTACT CHEMTREC AT 1-800-424-9300 FOR ASSISTANCE

In case of emergency call:
Telephone 316-597-2552

UNIFORM BILL OF LADING
- NOT NEGOTIABLE -

SHIPPER № 920886

Shipping Location XG-Hallowell, Ks.

SLURRY EXPLOSIVE CORPORATION
P.O. BOX 348
COLUMBUS, KANSAS 66725
Telephone (316) 597-2552

ATF No.: 5KS011-03000312

Date 11-26-91

SOLD TO NAME	ENN Technology, Inc. 435	SHIP TO NAME	[illegible]
ADDRESS	111 Robertsville Road	ADDRESS	Attn: Lapyan Chan
CITY	Oak Ridge	COUNTY	165 Fieldcrest Avenue
STATE	Tennessee 37831	CITY & STATE	Edison NJ 08837

CUSTOMER PHONE:	CUST. P.O. NO.	DATE SHIPPED	Received By:
201-225-2000		11-26-91	

FOB:	TRUCK Round Trip Mileage	TRAILER # / TRUCK #	CUSTOMER ATF NO.:	OUTSIDE CARRIER
Hallowell			N/A	ABF

Total Quantity Weight	No. and Type of Packages	H.M.	PROPER SHIPPING MEMO - HAZARD CLASS	"DOT" or "IATA"
			High Explosive - Class A Explosive	✓
			Ammonium Nitrate - Fuel / Oil Mixture - Blasting Agent	✓
			Ammonium Nitrate (no organic coating) - Oxidizer	UN1942
			Ammonium Nitrate Mixed Fertilizer - Oxidizer	UN2067
			Blasting Agent, n.o.s. - Blasting Agent	✓
			Fuse Safety - Class C Explosive	✓
			Fuel Oil - Combustible Liquid	UN1993
			Detonators, Class A Explosives	✓
			Detonators, Class C Explosives	✓
			Cord, Detonating Flexible - Class A Explosive	✓
			Cord, Detonating Flexible - Class C Explosive	✓
			Oxidizer, Corrosive, Liquid, n.o.s. - Oxidizer	NA1693
			Oxidizer, n.o.s. - Oxidizer	UN1479
200	20--	****	Nitromethane - Lid Qty - Flammable Liquid	UN1261
400	20--	***	Ammonium Nitrate (No Organic Coating Lid. Qty.) - Oxidizer	UN1942

PLACARDS APPLIED

EXPLOSIVES A
DANGEROUS
BLASTING AGENTS
OXIDIZER
FLAMMABLE
COMBUSTIBLE LIQUID

DOT EXEMPTION

- ☐ 4453
- ☐ 5206
- ☐ 8674
- ☐ _____

LBS / UNITS	DATE CODE	PRODUCT CODE	ITEM	UNIT PRICE	IMPOST	TOTAL AMOUNT
000						
125/5 cs	112490	0074200	T-100 Yellow Solid			
375/15 cs	111790	0074200	" "			
220/20 cs	110191	0074100	T-100 Yellow Liquid Liter			
		Y	Hfr Ins Surcharge			
			Freight Charges			

	H/T	H/T	SUB TOTAL
SALES TAX	STATE	%	
	LOCAL	%	
TOTAL DUE			

This sale is expressly made conditional on assent to all of the terms and conditions stated herein, including those stated on the reverse side hereof.

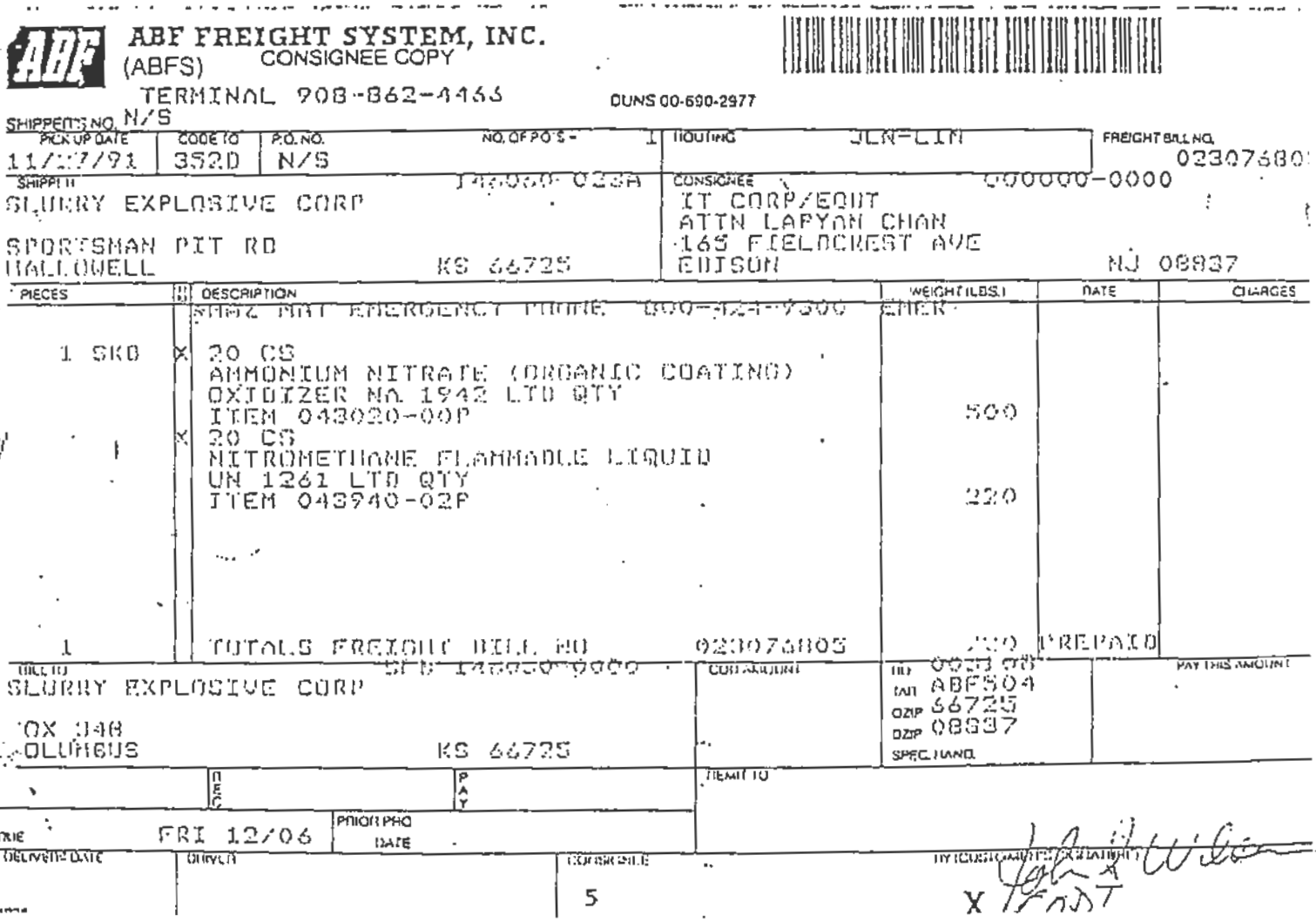
CERTIFICATE

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

BY Wm. Terry Wright, Operations Manager
Plant / Warehouse

SPECIAL INSTRUCTIONS: MSDS Enclosed

FIGURE 120E-4: EXAMPLE FREIGHT COMPANY SHIPPING DOCUMENT



ABF FREIGHT SYSTEM, INC.
(ABFS) CONSIGNEE COPY
TERMINAL 908-862-4466 DUNS 00-690-2977

SHIPPER'S NO. N/S

PICK UP DATE	CODE TO	P.O. NO.	NO. OF PO'S	ROUTING	FREIGHT BILL NO.
11/27/91	3520	N/S	1	JLN-LIN	02307680

SHIPPER
SLURRY EXPLOSIVE CORP
SPORTSMAN PIT RD
HALLOWELL KS 66725

CONSIGNEE 000000-0000
IT CORP/EQUT
ATTN LARYAN CHAN
165 FIELDCREST AVE
EDISON NJ 08837

PIECES		DESCRIPTION	WEIGHT (LBS.)	RATE	CHARGES
		SHAZ MAT EMERGENCY PHONE 800-424-9300 CHEM			
1 SKD	X	20 CS AMMONIUM NITRATE (ORGANIC COATING) OXIDIZER NA 1942 LTD QTY ITEM 043020-00P	500		
	X	20 CS NITROMETHANE FLAMMABLE LIQUID UN 1261 LTD QTY ITEM 043940-02P	220		
1		TOTALS FREIGHT BILL NO 02307680S	720	PREPAID	

BILL TO
SLURRY EXPLOSIVE CORP
BOX 348
OLUMBUS KS 66725

COD AMOUNT

TO 0023 08
TAT ABFS04
DZIP 66725
DZIP 08837
SPEC HAND

PAY THIS AMOUNT

REC
PAY

REMIT TO

DELIVERY DATE FRI 12/06
PRIOR PRO DATE
DELIVERY DATE
DRIVER
CONSIGNEE 5
SHIPPER/CONSIGNEE/AUTHORIZED REPRESENTATION
X

EODT Explosive Accountability Record
(Magazine Data Card)

Product Code/FSN:	Nonmenclature:	Location:
Date Code/Lot NR:	Qty Per Case:	Qty of Cases:

Date	Bill of Lading/ Voucher NR	Received From/ Issued To	Qty Received	Qty Issued	Balance	Intials	

FIGURE 120E-5: EXPLOSIVES ACCOUNTABILITY RECORD/MAGAZINE DATA CARD

EODT Explosive Accountability Record
(Magazine Data Card)

Product Code/FSN: 0074200	Nonmenclature: T-100, Yellow Stick, Solid	Location: Raritan (Edison, NJ)
Date Code/Lot NR: 112490	Qty Per Case: 34	Qty of Cases: 5

Date	Bill of Lading/ Voucher NR	Received From/ Issued To	Qty Received	Qty Issued	Balance	Intials	
11/30	980886	SEC via ABF Freight	170		170		
12/05	980886	Demo Team/B. Brindle		34	136		
12/07	980886	Demo Team/D. Garron		136	136		
12/10	980886	Weekly Inventory			0		
12/10	980886	Demo Team/ D. Garron	36		36		
12/12	980886	CEHNC-Project Closed Out		36	0		
		SAMPLE					

FIGURE 120E-5: EXPLOSIVES ACCOUNTABILITY RECORD/MAGAZINE DATA CARD

STANDARD OPERATING PROCEDURE 107

EXCAVATION AND TRENCHING

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving excavation or trenching.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involving soil excavation or trenching. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart P; and
- USACE EM 385-1-1, Section 25.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 FIELD MANAGER/SENIOR UXO SUPER (FM/SR UXO SUPER)

The FM/SR UXO SUPER will ensure that this SOP is implemented for excavation or trenching operations. The FM/SR UXO SUPER will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 TEAM LEADER/UXO SUPERVISOR (TL/UXO SUPER)

The TL/UXO SUPER shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER (SSHO)

The SSHO will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

4.5 TRENCHING AND EXCAVATION COMPETENT PERSON

A trenching and excavation competent person is one who by virtue of experience or training is capable of identifying existing and predictable hazards in the surroundings or working conditions and is authorized to take corrective actions. This person may be the SSHO, a registered professional engineer or other site personnel with the appropriate knowledge and experience needed to accurately assess trenching/excavation hazards. The competent person will be responsible for inspecting the trenching/excavation when employee exposure to potential hazards can be reasonably expected. The inspection shall be conducted daily prior to personnel entry into the trench/excavation site and after every rainstorm or other hazard increasing occurence. The competent person shall complete the Daily Excavation Checklist (see Figure 2) each time the excation is inspected and shall post a copy of the inspection at the excavation site.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in excavation or trenching operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

The safety and health hazards and operational control techniques to be used during conduct of excavation or trenching operations are discussed below:

1. Prior to initiation of any excavation or trenching activity, the location of underground utilities and installations shall be determined;
2. When the excavation/trench achieves a depth of five feet, a competent person shall inspect the excavation or trench prior to entry by personnel to determine if there are any indications that a cave-in could occur;
3. An excavation or trench greater than five feet in depth shall be inspected daily by a competent person prior to commencement of work activities;

4. Evidence of cave-ins, slides, sloughing, or surface cracks will be cause for work to cease until necessary precautions are taken to safeguard workers;
5. Excavations five feet or deeper, will be sloped at an angle of one and one half horizontal to one vertical (34 degrees measured form the horizon);
6. Excavations five feet or deeper which can not be sloped as specified in item 5 above shall require a registered engineer to design the sloping/benching/support system;
7. Protective systems shall be selected from OSHA 29 CFR 1926 Subpart P and/or designed by a registered professional civil engineer;
8. Spoils and other materials shall be placed 2 ft. or more from the edge of the excavation or trench;
9. Materials used for sheeting, shoring, or bracing shall be in good condition;
10. Timbers shall be sound, free of knots, and of appropriate dimensions for the trench;
11. Safe access shall be provided into the excavation(s) by means of a gradually sloped personnel access/egress ramp, or ladders or stairs will be provided;
12. Ladders used shall extend 3 ft. above grade level and be secured from movement;
13. Excavations 4 ft. or more in depth shall have a means of egress at a frequency such that lateral travel to the egress point does not exceed 25 ft.;
13. Walkways or bridges with standard guardrail shall be provided where employees are required or permitted to cross over excavations;
14. If the depth of an excavation or trench is greater than 4 feet, it shall be inspected by the SSHO to determine if it meets the criteria for a confined space;
15. Accumulated water inside an excavation or trench shall be removed prior to entry by personnel;
16. If an excavation or trench is determined to be a Confined Space the requirements set forth in the Confined Space Program found in the EODT CSHP shall apply;
17. All excavations or trenches shall be properly barricaded or flagged off to prevent personnel from accidently falling into the excavation or trench; and
18. IAW the requirements of 29 CFR 1926.651(g), if an excavation or trench is greater than 4 feet in depth, and the potential for having a hazardous atmosphere inside the excavation or trench exists, then the atmosphere shall be tested for oxygen deficiency and toxicity prior to entry by site personnel.

5.2 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Personnel shall wear the appropriate level of protection as specified in the SSHP. The PPE outlined in the SSHP will have been selected IAW the chemical and physical hazards anticipated for the given task. Additionally, no site personnel shall enter a trench or excavation site until it has been inspected by a competent person and all safety and health related precautions and controls have been implemented.

6.0 AUDIT CRITERIA

The following items related to excavation or trenching operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Daily Excavation Checklist;
3. The Documentation of Training form for the initial site hazard training;
4. The Documentation of Training form for the Daily Tailgate Safety Briefing; and
5. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

1. The Daily Excavation Checklist

DAILY EXCAVATION CHECKLIST

	W/C	N/C	N/A
1. Has the excavation or trench been inspected by a competent person and have the safety requirements been established?	☐	☐	☐
2. Have the underground utilities been identified and located?	☐	☐	☐
3. Has the protection system (shoring, benching, sloping, etc.) been selected and installed and monitored daily?	☐	☐	☐
4. Are adjacent surfaces encumbrances removed or barricaded?	☐	☐	☐
5. Where employees are permitted to cross over excavation, are walkways or bridges provided?	☐	☐	☐
6. Are ramps and bridges designed by a competent person?	☐	☐	☐
7. Are stairways, ladders, ramps, or other safe means of egress provided within 25 feet of every employee?	☐	☐	☐
8. If mobile equipment must operate next to the excavation, are suitable barricades, flagging, stop logs, or beams provided to prevent encroachment on bank edges?	☐	☐	☐
9. Are employees exposed to overhead loads handled by lifting or excavating equipment?	☐	☐	☐
10. Is atmospheric monitoring (confined space program) conducted in excavations where hazardous atmospheres could reasonably be present?	☐	☐	☐
11. If the excavation or trench is classified as a confined space, is the appropriate rescue equipment readily available?	☐	☐	☐

Key: W/C - Within compliance N/C - Not in compliance N/A - Not applicable

DAILY EXCAVATION CHECKLIST (con't)

	W/C	N/C	N/A
12. If there is a water hazard present, are adequate precautions in place to prevent flooding?	☐	☐	☐
13. If adjacent structures (building foundations, sidewalks, roadways, etc.) are undermined by the excavation, has a suitable support system been designed by a registered professional engineer?	☐	☐	☐
14. Employees must be protected from falling loose rock and soil. Is the spoil at least two feet back from the edge?	☐	☐	☐
15. Is the excavation and trench checklist being maintained at the excavation site and in the site records?	☐	☐	☐
CALIFORNIA ONLY			
1. Has CAL-OSHA been contacted for an excavation permit?	☐	☐	☐
2. Is the permit on file and accessible for review during an inspection?	☐	☐	☐

KEY: W/C - Within compliance N/C - Not in compliance N/A - Not Applicable

CORRECTIVE ACTIONS

_____

_____

_____

_____

_____

Date Completed: _____

Competent Person: _____ _____

Signature Printed Name

Figure 2

STANDARD OPERATING PROCEDURE 116
SITE RULES AND PROHIBITED PRACTICES

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements, procedures and site standing orders applicable to the conduct of operations on site. These standing orders outline the rules which will be strictly enforced during all on site activities.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, who are involved in operations in the exclusion, contamination reduction and support zones (EZ, CRZ, and SZ). The rules and prohibited practices outlined here are required to help ensure the safety and health of all site personnel, the environment and the general public. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926.65;
- OSHA General Industry Standard 29 CFR Part 1910.120; and
- USACE EM 385-1-1, Section 28.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for all operations. The SUXOS will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 UXO SUPERVISOR

The UXO Supervisor (UXOS) shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP. In the absence of a SUXOS, the UXOS shall be responsible for implementing the SUXOS responsibilities outlined in para 4.2.

4.4 SITE SAFETY AND HEALTH OFFICER

The Site Safety and Health Officer (SSHO) will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All site personnel, including contractor and subcontractor personnel, involved in any site operation shall be familiar with the rules and prohibited practices listed in this SOP. The items outlined in the standing orders listed below are considered to be the minimum rules and prohibited practices which will be enforced onsite. This list may be expanded by the SSHO, based upon site conditions and characteristics. Since the safety and health of all site personnel, the environment and the general population is of paramount importance, all personnel will be expected to follow the standing orders at all times. Violation of these standing orders, or those imposed by the SSHO, may lead to personal injury or property damage, and may be grounds for positive disciplinary action.

5.1 SITE STANDING ORDERS

5.1.1 General Standing Orders For The Site

The standing orders listed below shall be followed at all times by on-site personnel conducting operations in any location of the site.

1. The SSHP and all other required safety and health guidelines will be complied with at all times.
2. All necessary and feasible precautions will be taken to prevent injury to personnel.
3. Potentially harmful situations will be immediately reported to the SSHO.
4. Spillage and splashing of hazardous materials will be prevented to the extent possible, and spills of hazardous materials will be reported to the SSHO.
5. Good housekeeping shall be practiced by keeping the work area neat, clean and orderly.
6. All personal injuries, no matter how minor, will be reported to the SSHO.
7. Site equipment shall be maintained in good working order, and defective equipment shall be reported to the SSHO.
8. Personnel shall properly inspect, use and maintain PPE as required by the SSHP;

9. Running and horseplay are prohibited in all areas of the site, at all times.
10. Tobacco product use, eating, drinking, application of cosmetics or other hand to face activities are allowed only in designated areas.
11. Ignition of flammable materials in any work zone is prohibited, unless directed by the SSHO.
12. Buddy System procedures shall be enforced during all site operations.
13. The number of personnel in the SZ, CRZ or EZ shall be the minimum number necessary to perform work tasks in a safe and efficient manner.
14. Site personnel shall check in with the SSHO prior to leaving the site, and again upon returning to the site.
15. Site personnel will report to the SSHO any medical conditions or medications which could affect their ability to perform operations safely.
16. Site visitors are to be escorted by UXO qualified personnel at all times, and site operations will cease if non-UXO qualified personnel enter an area where UXO operations are being conducted.
17. Site personnel shall perform only those tasks which they are trained and qualified to perform.
18. Site personnel shall remain aware of site conditions at all times and shall alert the SSHO to any changes which could pose additional hazards.
19. "When in doubt. Don't do it". Ask questions first.

5.1.2 Standing Orders For The CRZ.

The standing orders listed below shall be followed at all times by on-site personnel conducting operations in the CRZ.

1. No tobacco product use, eating, drinking, application of cosmetics or other hand to face activities are allowed in this area, unless specifically provided for in the SSHP.
2. No matches or lighters in this zone.
3. Check-in/out at the access control point upon entrance to or exit from this zone.
4. Personnel handling potentially contaminated items shall wear appropriate PPE as prescribed by the SSHP.
5. Enter/Exit only through designated corridors.
6. Only "Buddies" enter/exit through this zone, no one passes through here alone, unless directed by the SSHO, and then only when line of sight can be maintained.
7. Hands and face shall be thoroughly washed upon leaving this zone.
8. Remember - "The Contamination Stops Here". Do your best to keep it that way.

5.1.3 Standing Orders For The EZ

The standing orders listed below shall be followed at all times by on-site personnel conducting operations in the EZ.

1. No tobacco product use, eating, drinking, application of cosmetics or other hand to face activities are allowed in this area.
2. No matches or lighters in this zone.
3. Check-in/out at the access control point upon entrance to or exit from this zone.
4. Always have your buddy with you in this zone, and follow the buddy system procedures.
5. No personnel allowed in this area without appropriate PPE as specified by the SSHP.
6. Remain alert to site conditions and report any changes or unusual occurrences to the SSHO.
7. Contact with contaminated or potentially contaminated surfaces should be avoided;
8. Whenever possible, do not walk through puddles, mud or any discolored ground surface.
9. Do not kneel on the ground or lean, sit or place equipment on drums, containers, potentially contaminated vehicles or the ground unless the potentially contaminated surface has been covered with plastic.
10. Visual or verbal contact shall be maintained between the site personnel and the Command Post at all times.
11. Remember - Site Safety and Health is Everyone's Responsibility. Do your part.

5.2 USE OF MODIFIED WORK SCHEDULES TO CONTROL EXPOSURES

Except as outlined in the Heat and Cold Stress SOPs, modification of work schedules is not considered to be an acceptable method to control personnel exposure to chemical or physical hazards. Any and all other feasible and effective means of controlling the degree and level of exposure, to include the use of personal protective equipment, will be developed and used prior to using modified work schedules as a means of control. Only in extreme cases where no other feasible, effective control method is available will work schedules be modified to reduce exposures. In the event that modified work schedules must be used, the procedures for monitoring the respective hazard and modifying personnel work schedules will be clearly outlined in the monitoring section of the SSHP.

5.3 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel will at all times comply with safety precautions, safe work practices and PPE requirements detailed in the SSHP for each task. Deviation from assigned safety precautions, practices and PPE will be allowed only after approval by the SSHO and the responsible contractor and/or client safety and health personnel.

6.0 AUDIT CRITERIA

The following items related to site operations will be audited to ensure compliance with this SOP:

1. The Daily Operational, Safety and Monitoring Logs;
2. The Documentation of Training form for the initial site hazard training;

3. The Documentation of Training form for the Daily Tailgate Safety Briefings; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

STANDARD OPERATING PROCEDURE 120-B
UXO/OEW OPERATIONS - MECHANICAL SIFTING

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of material separation operations involving the use of mechanical sifting equipment.

2.0 SCOPE

This SOP applies to all site personnel, to include contractor and subcontractor personnel, and operations involving the separation of material through the use of mechanical sifting equipment. This SOP is not intended to contain all requirements needed to ensure regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

The following Occupational Safety and Health Administration (OSHA) standards and U.S. Army Corps of Engineers (USACE) requirements directly apply to the conduct of operations associated with the SOP. In the event other hazards are associated with the conduct of this SOP, consultation of other SOPs and regulatory references may be needed.

- OSHA Construction Industry Standard 29 CFR Part 1926, Subpart O;
- OSHA General Industry Standard 29 CFR Part 1910, Subparts N and O; and
- USACE EM 385-1-1, Sections 16 A and B and Section 17 A.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

4.2 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for sifting operations. The SUXOS will also ensure that relevant sections of this SOP are discussed in the tailgate safety briefings and that information related to its daily implementation is documented in the Site Operational Log.

4.3 UXO SUPERVISOR

The UXO Supervisor (UXOS) shall be responsible for the field implementation of this SOP and for implementing the safety and health requirements outlined in section 5.0 of this SOP. In the absence

of a SUXOS, the UXOS shall be responsible for implementing the SUXOS responsibilities outlined in para 4.2.

4.4 SITE SAFETY AND HEALTH OFFICER

The Site Safety and Health Officer (SSHO) will be responsible for ensuring that the safety and health hazards and control techniques associated with this SOP are discussed during the initial site hazard training and the daily tailgate safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to ensure their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

All personnel, including contractor and subcontractor personnel, involved in sifting operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards.

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

The safety and health hazards and operational control techniques to be used during conduct of sifting operations are discussed below:

1. Daily tailgate safety meetings will be conducted, and noted in the Safety Log, as to the safety and health concerns pertaining to that days use of sifting equipment;
2. Sifting equipment and support vehicles shall be equipped with fire extinguishers;
3. When maintenance or servicing is to be accomplished on power driven equipment, the immediate source of power shall be controlled (refer to lockout/tagout SOP);
4. Sifting operations shall be restricted to daylight hours;
5. All site personnel shall be informed of the location of the "Kill Switch" for each piece of sifting related equipment on site;
6. Refer to SOP for heavy equipment for safety concerns relating to the use of the heavy equipment which will be used to load the sifter and remove sifted soils;
7. One UXOS will be assigned to each piece of sifting equipment, and will be responsible for its operation and the safety and health of its operators;
8. Only UXO qualified personnel will conduct sifting operations and debris separation;
9. Personnel will be positioned at their designated work stations prior to the start of sifting operations, and the sifting operation will start at the UXOS signal;
10. Once operations begin, only UXO-Qualified personnel may enter the work area;
11. Due to potential ordnance contamination, the heavy equipment operators will carefully place the material to be sifted into the sifting equipment hoper;
12. Any overflow form the sifter will be inspected by UXO-Qualified personnel, segregated as required, and returned to the hopper for processing;

13. Material passing down the conveyor belts will be visually inspected for UXO/OEW and any items identified as being UXO/OEW related will be removed and segregated into non-sparking containers;
14. As each load of soil processes through the sifting screens, the UXOS will periodically inspect the sifting screens to determine if UXO/OEW have been separated from the soil;
15. If UXO/OEW is present on the sifter screens, the UXOS will inspect the UXO/OEW to ensure it is safe to remove from the sifter and that it is not CWM;
16. If an ordnance item is identified being too hazardous to handle, all operations at that sifting unit will be discontinued and the personnel in that area will be evacuated;
17. If the UXO is determined to be CWM, all personnel with in 500 meters of the CWM will be evacuated, with the exception of two UXO qualified personnel who will be positioned at a safe distance up wind to observe the sifter unit with the CWM;
18. If an unsafe UXO or a CWM UXO is identified, the SUXOS will be notified. The SUXOS will notify the Corps of Engineers On Site Representative who will then summon military EOD or TEU support, and control of the site will be turned over to the military EOD upon their arrival.

5.2 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposures associated with sifting operations. These requirements will be implemented unless superseded by site specific requirements stated in the Site Safety and Health Plan.

1. Hard hats, steel-toe safety boots and protective gloves shall be worn when sifting equipment is in operation and when maintenance is being performed on the equipment;
2. Safety glasses shall be worn around sifting equipment unless full face respirators are required to be worn; and
3. Hearing protection shall be worn when sifting equipment is in operation unless the SSHO has measured and determined the noise levels to be less than 85 dBA TWA.

6.0 AUDIT CRITERIA

The following items related to sifting operations will be audited to ensure compliance with this SOP:

1. The Daily Operational and Safety Logs;
2. The Documentation of Training form for the initial site hazard training;
3. The Documentation of Training form for the Daily Tailgate Safety Briefings; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments associated with this SOP.

APPENDIX H

OF THE

WORK PLAN

FOR THE

OPEN BURNING GROUNDS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

VOLUME II

MATERIAL SAFETY DATA SHEETS

Contract Number: DACA87-97-D-0005
Task Order Number: 0003

Prepared For:

The U.S. Army Engineering and Support Center
Huntsville, Alabama

Prepared By:

EOD Technology, Inc.
10938 Hardin Valley Road
Knoxville, Tennessee 37932

November 1997

MATERIAL SAFETY DATA SHEET

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

NO. 469

FUEL OIL NO. 2

Date October 1981

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: FUEL OIL NO. 2
DESCRIPTION: Mixture of petroleum hydrocarbons; a distillate oil of low sulfur content.
OTHER DESIGNATIONS: ASTM D396, GE Material D27B1A, CAS #068-476 302
MANUFACTURER: Available from many suppliers, including:
AMOCO Oil Co.
200 East Randolph Drive
Chicago, Illinois 60601

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Fuel Oil No. 2		
Complex mixture of paraffinic, olefinic, naphthenic, and aromatic hydrocarbons		8-hr TWA 5 mg/m^3 (mineral oil mist)*
Sulfur content	<0.5	
Benzene**	<100 ppm	

*Current OSHA standard and ACGIH (1981) TLV

**A low benzene level reduces carcinogenic risk. Fuel oils are exempted under the benzene standard (29 CFR 1910.1028)

SECTION III. PHYSICAL DATA

Boiling point range, deg F, ——— Ca 340-675
Solubility in water ——————— negligible
Viscosity at 38 C, cSt ——————— 2.0-3.6
Specific gravity (H_2O=1) -- <0.876
Pour point, deg C ------ below -6

Appearance and Odor: Clear, bright liquid with a mild petroleum odor.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air, % by volume	LOWER	UPPER
100F min (TCC)	257 C (495F)		0.6	7.5

Extinguishing Media: Dry chemical, carbon dioxide, foam, water spray. Use a water spray to cool fire exposed containers. Use a smothering technique for extinguishing fire of this combustible liquid. Do not use a forced water stream directly on oil fire as this will only scatter the fire. Material is an OSHA Class II combustible liquid.
Firefighters should wear self-contained breathing apparatus and full protective clothing.

SECTION V. REACTIVITY DATA

This is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not undergo hazardous polymerization.
Incompatible with strong oxidizing agents; heating greatly increases fire hazard.
THermal-oxidative degradation may yield various hydrocarbons and hydrocarbon derivatives (partial oxidation products), CO_2 and CO and SO_2.

NO. 469

SECTION VI. HEALTH HAZARD INFORMATION

TLV 5 mg/m^3 oil (mist) (See Sect II)

Inhalation of excessive concentrations of vapor or mist can be irritating to the respiratory passages and can cause the following symptoms: headache, dizziness, nausea, vomiting, and loss of coordination. Prolonged or repeated skin contact may cause irritation of the hair follicles and block the sebaceous glands. This produces a rash of acne pimples and spots, usually on the arms and legs. (Good personal hygiene will prevent this).

Chemical pneumonitis may result when ingestion occurs and oil is aspirated in the lungs.

FIRST AID:

Eye Contact: Flush thoroughly with running water for 15 min. including under eyelids.

Skin Contact: Remove contaminated clothing. Wipe excess oil off with a dry cloth. Wash affected area well with soap and water.

Inhalation: Remove to fresh air. Restore and/or support breathing as required.

Ingestion: Do not induce vomiting.

Seek medical assistance for further treatment, observation and support.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of leaks or spills. Remove sources of heat or ignition.

Provide adequate ventilation. Clean-up personnel to use protection against liquid contact and vapor or mist inhalation. Contain spill by diking. Small spills can be contained by using absorbants, such as rags, straw, polyurethane foam, activated carbon, and sand. Clean up spills promptly to reduce fire or vapor hazards.

DISPOSAL: May be disposed of by a licensed waste disposal company, or by controlled incineration or burial in an approved landfill.

Follow Federal, State and Local regulations. Report large oil spills.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide adequate ventilation where operating conditions (heating or spraying) may create excessive vapors or mists. Use explosion proof equipment. Provide approved respiratory apparatus for nonroutine or emergency use. Use an approved filter & vapor respirator when vapor/mist concentrations are high. Wear protective rubber gloves and chemical safety glasses where contact with liquid or high mist conc. may occur. Additional suitable protective clothing may be required depending on working conditions. An eye-wash fountain and washing facilities to be readily available near handling and use areas.

Launder soiled or contaminated clothing before reuse (at least weekly laundering of work clothes is recommended).

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers in a cool, dry, well-ventilated area away from sources of open flame, heat, strong oxidizing agents, and ignition. Protect containers from physical damage. Use non sparking tools and explosion-proof electrical equipment. Prevent static electric sparks.

Avoid prolonged skin contact and breathing of vapors or mists.

No smoking in areas of use. Follow good hygienic practice in the use of this material. Do not wear oil contaminated clothing. Do not put oily rags into pockets. Wash exposed skin areas several times a day with soap and warm water when working with this material. DOT Classification: COMBUSTIBLE LIQUID

ATA SOURCE(S) CODE: 1,6,7,12

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Gerium Publishing Corporation extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS J. M. Miller

Industrial Hygiene and Safety 10-12-81

MEDICAL REVIEW: 21 October 1981

1 JOHS 979
S.C. JOHNSON & SON, INC.
DEEP WOODS OFF! FOR SPORTSMEN INSECT REPELLENT V
7408D51-2
03/14/94
JOHNSON WAX Material Safety Data Sheet Page 1

S.C. Johnson Wax
1525 Howe Street
Racine, Wisconsin 53403

Emergency Medical Phone: (800) 228-5635 Ext 092
Informational Contact: Terry A. Meyers
Phone: (800) 725-6737

********** Section I - Product Identification **********

	HMIS RATING	NFPA RATING
4=Very High		
3=High		
2=Moderate	HEALTH: 1	HEALTH:
1=Slight	FLAMMABILITY: 4	FLAMMABILITY:
0=Insignificant	REACTIVITY: 0	REACTIVITY:

PRODUCT NAME: DEEP WOODS OFF! FOR SPORTSMEN INSECT REPELLENT V
PRODUCT NUMBER: 7408D51-2
SERIAL NUMBER: 001
ISSUE DATE: 03/14/94
SUPERCEDES DATE: NA

********** Section II - Ingredient Information **********

WEIGHT %	INGREDIENT AND EXPOSURE LIMIT
< 1.00	Other Isomers Exposure Limit: NE
2-15	Propane, Isobutane, N-Butane (CAS#106-97-8, 75-28-5, 74-98-6) Exposure Limit: 800 PPM ACGIH\OSHA TWA NOT ESTABLISHED 1000 PPM OSHA PEL
40	N,N-diethyl-meta-toluamide (DEET) (CAS#134-62-3) Exposure Limit: NOT ESTABLISHED
50-60	Ethyl Alcohol (CAS#64-17-5) Exposure Limit: 1000 PPM ACGIH\OSHA TWA

There are no ingredients subject to the reporting requirements under California's Proposition 65.

All components of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

********** Section III - Physical Data **********

APPEARANCE\ODOR: Dispensed as a spray mist with citrus odor
VAPOR PRESSURE (mm Hg): ND
SOLUBILITY IN WATER: Appreciable
FREEZING POINT (F): NA
pH: NA
SPECIFIC GRAVITY (H2O=1): 0.82
PERCENT VOLATILE BY VOLUME (%): NA
VAPOR DENSITY (Air=1): ND
BOILING POINT (F): ND
EVAPORATION RATE (Butyl Acetate=1): NA

********** Section IV - Fire and Explosion Information **********

1 JOHS 979
S.C. JOHNSON & SON, INC.
DEEP WOODS OFF! FOR SPORTSMEN INSECT REPELLENT V
7408D51-2
03/14/94

FLASH POINT (F) (Method Used): under 20(TCC) (Propellant)
FLAMMABLE LIMITS: ND
EXTINGUISHING MEDIA: Foam. CO2. Dry Chemical. Water Fog.
SPECIAL FIREFIGHTING PROCEDURES: Normal fire fighting procedures may be used. Fight fire from maximum distance or protected area. Cool and use caution when approaching or handling fire-exposed containers. Fire fighters should wear self-contained breathing apparatus and protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS: No special hazards known.

********** Section V - Health Hazard Data **********

PRIMARY ROUTE OF ENTRY: Eye contact. Ingestion.
SIGNS AND SYMPTOMS: Direct contact of product with eyes can cause irritation. Product may cause distress and illness if taken internally.
FIRST AID PROCEDURES: Flush eyes with water for 15-20 minutes. If irritation persists, seek medical aid. If product is swallowed, seek medical aid at once.

********** Section VI - Reactivity Data **********

STABILITY-CONDITIONS TO AVOID: None known
INCOMPATIBILITY: None known
HAZARDOUS DECOMPOSITION PRODUCTS: When exposed to fire, produces normal products of combustion.
HAZARDOUS POLYMERIZATION: Will not occur.
HAZARDOUS POLYMERIZATION-CONDITIONS TO AVOID: None known

********** Section VII - Spill or Leak Procedures **********

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Eliminate all ignition sources. Rinse affected area thoroughly with water.
WASTE DISPOSAL INFORMATION: Recycle empty aerosol can to nearest steel recycling center. Use up package or give to someone who can.

********** Section VIII - Special Protection Information **********

RESPIRATORY PROTECTION: No special requirements under normal use conditions.
VENTILATION: General room ventilation adequate.
PROTECTIVE GLOVES: No special requirements under normal use conditions.
EYE PROTECTION: No special requirements under normal use conditions.
OTHER PROTECTIVE MEASURES: Use good personal hygiene practices.

********** Section IX - Special Precautions **********

PRECAUTIONARY LABELING: CAUTION: Harmful if swallowed. Causes eye irritation. Avoid contact with eyes and lips. May cause skin reaction in rare cases.
PRECAUTIONARY LABELING (cont.): Do not expose treated surfaces near fire or flame until alcohol has evaporated. Flammable! Contents under pressure. Do not use near fire, heated surfaces, sparks or flame. See Section X.
OTHER HANDLING AND STORAGE CONDITIONS: Keep out of reach of children.

****

1 JOHS 979
S.C. JOHNSON & SON, INC.
DEEP WOODS OFF! FOR SPORTSMEN INSECT REPELLENT V
7408D51-2
03/14/94

ADDITIONAL INFORMATION: NFPA 30B Level 2 Store away from heat or flame in an area inaccessible to children.

********** Section XI - Transportation Information **********

DOT CLASS: ORM-D.
DOT #: NA
SHIPPING NAME: Insecticides or insect repellents, NOI, other than poison.
DOT NOTES: Consumer Commodity.
SECTIONS OF MSDS WITH CHANGES: NA
EPA REGISTRATION #: 4822-398

****

The information herein is given in good faith. No warranty, expressed or implied is made. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations. The information contained in this form is is confidential and is submitted solely for your organization's internal use. R-106 (Rev 5 - 10/90)

UNLEADED GASOLINE

34310019 Revised 19-NOV-1994 Printed 13-JAN-1995

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : DU001044

Tradenames and Synonyms

AUTOMOTIVE UNLEADED GASOLINE
PETROL
MOTOR SPIRITS
GASOLINE - UNLEADED
CC0379

Company Identification

MANUFACTURER/DISTRIBUTOR
PURCHASED MATERIAL

PHONE NUMBERS
Transport Emergency : CHEMTREC: 1-800-424-9300
Medical Emergency : 1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
GASOLINE	8006-61-9	100
*BENZENE	71-43-2	0.1-4.9
*ETHYLBENZENE	100-41-4	~2
*CUMENE	98-82-8	~1
*PSEUDOCUMENE	95-63-6	~2
*METHYL T-BUTYL ETHER	1634-04-4	<15
*XYLENES	1330-20-7	~12
*TOLUENE	108-88-3	~15

* Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Components (Remarks)

Components listed above are typical for Conoco produced gasoline. Gasoline is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical, specifications. It may contain various proprietary additives.

This MSDS does not cover leaded gasoline.

HAZARDS IDENTIFICATION

Potential Health Effects

Primary Routes of Exposure/Entry: Skin, Inhalation.

Signs and Symptoms of Exposure/Medical Conditons Aggravated by Exposure: A few studies have indicated that workers exposed many years to high concentrations of benzene have a slightly higher incidence of leukemia. Benzene can also be toxic to the blood and blood-forming tissues.

Studies with mice or rats have shown that some petroleum distillates have caused either damage or tumors of the kidneys or tumors of the liver. However, kidney effects were not seen in similar studies involving guinea pigs, dogs or monkeys. Also, the significance of the liver tumors in rodents is highly speculative.

Mouse skin painting studies have shown that petroleum middle distillates (boiling range of 100-700 deg F; naphtha, jet fuel, diesel fuel, kerosene, etc.) can cause skin cancer when repeatedly applied and never washed from the animal's skin. The relative significance of this to human health is uncertain since the petroleum distillates were not washed from the skin and resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. A few studies have shown that washing the animal's skin with soap and water between treatments greatly reduces the carcinogenic effect of some petroleum oils.

The product contains petroleum hydrocarbons which may cause irritation to eyes, skin and lungs after prolonged or repeated exposure. Extreme exposure or aspiration into the lungs may cause pneumonia. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other nervous system effects; greater exposure may cause dizziness, slurred speech, flushed face, unconsciousness or convulsions.

Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens. A "P" indicates a proposed carcinogen.

Material	IARC	NTP	OSHA	ACGIH
GASOLINE	X			
BENZENE	X	X	X	X

Du Pont controls the following materials as potential carcinogens: BENZENE.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately wash skin with soap and water. Wash contaminated clothing before reuse.

If irritation develops, consult a physician.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 grams activated charcoal in 400 mL water and mix thoroughly. Administer 5 mL/kg, or 350 mL for an average adult.

Minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	: As low as -50 F
Method	: TCC
Flammable limits in Air, % by Volume	
LEL	: < 1
UEL	: 8

Flammable liquid. Vapor forms explosive mixture with air. Vapors or gases may travel considerable distances to ignition source and flash back.

NFPA Classification : Class IA Flammable Liquid.

Hazardous gases/vapors produced in fire are carbon monoxide.

Extinguishing Media

Foam, Dry Chemical, CO2.

Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Shut off source of fuel, if possible and without risk. Cool tank/container with water spray.

Special Fire Fighting Procedures: Water may be ineffective to extinguish, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Water spray may be used to flush spills away from areas of potential ignition.

Unusual Fire and Explosion Hazards: Highly Flammable. Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus.

Initial Containment

Remove source of heat, sparks, flame, impact, friction or electricity. Dike spill. Prevent material from entering sewers, waterways, or low areas.

Accidental Release Measures

Several components of gasoline are subject to the Superfund reportable discharge requirements if spilled. Concentrations of gasoline components with a Superfund Reportable Quantity (RQ) will depend on vendor formulations.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses.

Handling (Physical Aspects)

Ground container when pouring. Use of non-sparking and explosion-proof equipment may be necessary depending on type of operation. Keep away from heat, sparks and flames.

Storage

Keep container in a cool place. Do NOT expose to direct sunlight. Store in a well ventilated place. Keep container tightly closed. Store in accordance with National Fire Protection Association recommendations.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Keep container tightly closed.

Use ventilation that is adequate to keep employee exposure to airborne concentrations below exposure limits.

Personal Protective Equipment

EYE/FACE PROTECTION

Wear safety glasses. Wear coverall chemical splash goggles and face shield when the possibility exists for eye and face contact due to splashing or spraying of material.

RESPIRATORS

A NIOSH/MSHA approved air purifying respirator with a organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PROTECTIVE CLOTHING

Wear impervious clothing, such as gloves, apron, boots or whole bodysuit as appropriate. Conoco recommends NBR or Neoprene impervious clothing.

Exposure Guidelines

Applicable Exposure Limits

GASOLINE

PEL (OSHA)	: None Established
TLV (ACGIH)	: 300 ppm, 890 mg/m3, 8 Hr. TWA STEL 500 ppm, 1,480 mg/m3
AEL * (Du Pont)	: None Established

BENZENE

PEL (OSHA)	: 1 ppm, 8 Hr. TWA 5 ppm, STEL 0.5 ppm, Action Level
TLV (ACGIH)	: 10 ppm, A2, 32 mg/m3, A2, 8 Hr. TWA Notice of Intended Changes (1994-1995) 0.3 ppm, 0.96 mg/m3, 8 Hr. TWA, Skin, A1
AEL * (Du Pont)	: 1 ppm, 8 & 12 Hr. TWA 5 ppm, 15 minute TWA

ETHYLBENZENE

PEL (OSHA)	: 100 ppm, 435 mg/m3, 8 Hr. TWA
TLV (ACGIH)	: 100 ppm, 434 mg/m3, 8 Hr. TWA STEL 125 ppm, 543 mg/m3
AEL * (Du Pont)	: None Established

CUMENE

PEL	(OSHA)	: 50 ppm, 245 mg/m3, 8 Hr. TWA, Skin
TLV	(ACGIH)	: 50 ppm, 246 mg/m3, 8 Hr. TWA, Skin
AEL *	(Du Pont)	: None Established

PSEUDOCUMENE

PEL	(OSHA)	: 25 ppm, 125 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 25 ppm, 123 mg/m3, 8 Hr. TWA
AEL *	(Du Pont)	: None Established

METHYL T-BUTYL ETHER

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: 40 ppm, 144 mg/m3, 8 Hr. TWA Notice of Intended Changes (1994-1995) 40 ppm, 144 mg/m3, 8 Hr. TWA, A3
AEL *	(Du Pont)	: None Established
WEEL	(AIHA)	: 100 ppm, 8 Hr. TWA

XYLENES

PEL	(OSHA)	: 100 ppm, 435 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 100 ppm, 434 mg/m3, 8 Hr. TWA STEL 150 ppm, 651 mg/m3
AEL *	(Du Pont)	: 100 ppm, 8 Hr. TWA 150 ppm, 15 minute TWA

TOLUENE

PEL	(OSHA)	: 200 ppm, 8 Hr. TWA 300 ppm, Ceiling 500 ppm - 10 Min. Max.
TLV	(ACGIH)	: 50 ppm, 188 mg/m3, 8 Hr. TWA, Skin
AEL *	(Du Pont)	: 50 ppm, 8 & 12 Hr. TWA

* AEL is Du Pont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: 29-225 C (84-437 F)
Vapor Pressure	: 275-475 mm Hg @ 20 C (68 F)
% Volatiles	: 100% by Volume
Solubility in Water	: May be slightly soluble
Odor	: Gasoline
Form	: Liquid
Color	: Red-dyed, pink, or colorless to light yellow
Specific Gravity	: 0.70-0.77 (H2O=1)

Physical Hazards

Physical and Flammable properties are typical of Conoco products; data reported above may vary slightly for other vendors' products.

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Avoid contact with strong oxidants such as chlorine, concentrated oxygen, or hypochlorites. Keep from heat, flame and other ignition sources.

Decomposition

Hazardous gases/vapors produced are carbon monoxide from incomplete oxidation.

Polymerization

Polymerization will not occur.

DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Recycle as much of the recoverable product as possible.

CERCLA RQ - METHYL TERT-BUTYL ETHER = 1 LB

TRANSPORTATION INFORMATION

Shipping Information

DOT

Proper Shipping Name	: GASOLINE
Hazard Class	: FLAMMABLE LIQUID
I.D. No. (UN/NA)	: UN1203
DOT Label(s)	: FLAMMABLE LIQUID
DOT Placard	: FLAMMABLE

DOT/IMO

Proper Shipping Name	: GASOLINE OR MOTOR SPIRIT

Hazard Class : 3 (IMO 3.1)
UN No. : UN1203
DOT/IMO Label : FLAMMABLE LIQUID
Packing Group : II

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : Yes
Reactivity : No
Pressure : No

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 1
Flammability : 3
Reactivity : 0

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : Du Pont
Address : Corporate MSDS Office - HR
Barley Mill Plaza, P14-2150
Wilmington, DE 19880-0014
Telephone : 302-992-6704

# Indicates updated section.

End of MSDS

WD-40®

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
		Emergency Only:	1 (800) 424-9300 (CHEMTREC)
Address:	1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California 92138-0607	Information:	(619) 275-1400
		Chemical Name:	Organic Mixture
		Trade Name:	WD-40 Bulk Liquid

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA
Aliphatic Petroleum Distillates	8052-41-3	70	100 ppm PEL
Petroleum Base Oil	64742-65-0	> 20	5 mg/M³ TWA (mist)
Non-hazardous Ingredients		< 10	

III. PHYSICAL DATA

Boiling Point:	300°F (minimum)	Evaporation Rate:	Not determined
Vapor Density (air = 1):	Greater than 1	Vapor Pressure:	Not determined
Solubility in Water:	Insoluble	Appearance:	Cloudy light amber
Specific Gravity (H_2O = 1):	.800 @ 70°F	Odor:	Characteristic odor
Percent Volatile (volume):	74%	VOC:	568 grams per liter

IV. FIRE AND EXPLOSION

Flash Point:	Tag Open Cup 110°F (minimum)
Flammable Limits:	(solvent portion) [Lel] 1.0% [Uel] 6.0%
Extinguishing Media:	CO_2, Dry Chemical, Foam
Special Fire Fighting Procedures:	None
Unusual Fire and Explosion Hazards:	None

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value

Aliphatic Petroleum Distillates (Stoddard solvent) lowest TLV (ACGIH 100 ppm.)

Symptoms of Overexposure

Inhalation (Breathing): May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
Skin Contact: May cause drying of skin and or irritation.
Eye Contact: May cause irritation, tearing and redness.
Ingestion (Swallowed): May cause irritation, nausea, vomiting and diarrhea.

First Aid Emergency Procedures

Ingestion (Swallowed): Do not induce vomiting, seek medical attention.
Eye Contact: Immediately flush eyes with large amounts of water for 15 minutes.
Skin Contact: Wash with soap and water.
Inhalation (Breathing): Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.

DANGER!

Aspiration Hazard: If swallowed can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call Physician immediately.

Suspected Cancer Agent

Yes_____ No__X__ The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA.

VI. REACTIVITY DATA

Stability:	Stable__X__	Unstable_____
Conditions to avoid:	NA	
Incompatability:	Strong oxidizing materials	
Hazardous decomposition products:	Thermal decomposition may yield carbon monoxide and/or carbon dioxide.	
Hazardous polymerization:	May occur_____	Will not occur__X__

VII. SPILL OR LEAK PROCEDURES

Spill Response Procedures

Absorb small quantities with sand, earth, sawdust. Large quantities pump into tank.

Waste Disposal Method

Incinerate liquid, bury saturated absorbent in land fill. Dispose of in accordance with local, state and federal regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation:	Sufficient to keep solvent vapor less than TLV.
Respiratory Protection:	Advised when concentrations exceed TLV.
Protective Gloves:	Advised to prevent possible skin irritation.
Eye Protection:	Approved eye protection to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment:	None required.

IX. SPECIAL PRECAUTIONS

Keep from open flame, do not take internally. Avoid excessive inhalation of spray particles. Keep from children.

X. TRANSPORTATION DATA

Domestic Surface

Description:	Petroleum Distillates N.O.S.
Hazard Class:	Combustible Liquid
ID No.:	UN 1268
Packaging Group:	III
Label Required:	NONE, for containers less than 100 Gallons

Domestic Air

Description:	Petroleum Distillates N.O.S. (Stoddard Solvent)
Hazard Class:	3 UN 1268 PGIII
Label Required:	Flammable Liquid

XI. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.

SARA Title III chemicals:	None
California Prop 65 chemicals:	None
CERCLA reportable quantity:	None
RCRA hazardous waste no:	D001 (Ignitable)

SIGNATURE: R. Miles TITLE: Technical Director

REVISION DATE: October 1993 SUPERSEDES: August 1992

A = Not applicable NDA = No data available < = Less than > = More than

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty expressed or implied. It is the users responsibility both

SPECIALTY OIL COMPANY
Stihl Two-Cycle Engine Oil

Date Issued: 10/31/90
Supersedes Date: 05/04/88

MATERIAL SAFETY DATA SHEET

Westland Oil Company P.O. Box 8098 Shreveport, IA 71108

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
Stihl Two-Cycle Engine Oil

PRODUCT CODE

CHEMICAL NAME
Petroleum Lubricating Oil

CAS NUMBER
Complex Mixture
CAS Number Not Applicable

PRODUCT APPEARANCE AND ODOR
Dark Emerald Green Liquid; Ammonia Odor

EMERGENCY TELEPHONE NUMBER
(318)-687-8000

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stocks	64742-54-7 or 64742-65-0 and 64742-57-0 or 64742-62-7	Greater than 85%
Proprietary Additives	Mixture	Less than 10%
Mineral Spirits	8052-41-3	Less than 10%

See Section E for Health and Hazard Information

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity
1	2	0

Hazard Ratings
0-Least 3-High
1-Slight 4-Extreme
2-Moderate

EXPOSURE LIMIT FOR TOTAL PRODUCT
100 ppm (570 mg/m3) for an 8-hour workday.

BASIS
Recommended by Westland for light hydrocarbon fraction present in product.

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician

SKIN

In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)	AUTOIGNITION TEMPERATURE
175+ (PMCC)	Greater than 500 F

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	2	0	Recommended by Westland

HANDLING PRECAUTIONS

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fire involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialtists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials". Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations. ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (SIGNS AND SYMPTOMS OF EXPOSURE)

Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION

In accordance with the current OSHA Hazard Communication Standard criteria, this product does not require a cancer hazard warning. This is because the product is formulated from base stocks which are severely hydrotreated, severely solvent extracted, and/or processed by mild hydrotreatment and extraction. Alternatively, it may consist of components not otherwise affected by IARC criteria, such as vacuum distillates or synthetically derived materials, and as such is not characterized by current IARC classification criteria.

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis. However, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Continuous contact with used motor oil has caused skin cancer in animal tests.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Not Determined

SPECIFIC GRAVITY
0.8810

MOLECULAR WEIGHT
Not Determined

pH
Essentially Neutral

POUR, CONGEALING OR MELTING POINT
-20 F Pour Point by ASTM D97

VISCOSITY
74.43 cSt @ 40 C

VAPOR PRESSURE
Less than 5 mm Hg @ 20 C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
8.0

EVAPORATE RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
0.2

SOLUBILITY IN WATER @ ATM. AND 25 C (77F)
Negligible: less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochylorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED.

Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302

Not applicable

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372

Not applicable

EPA HAZARD CLASSIFICATION CODE:

Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
					XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS

Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly

after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transporatation Emergency Response Guidebook for Hazardous Materials Incidents. DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Not Applicable

The information and recommendations contained herein are, to the best of Westland's knowledge and belief, accurate and reliable as of the date issued. Westland does not warrant or guarantee their accuracy or reliability, and Westland shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Westland Oil Company, Inc., in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Westland's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
Westland Oil Company, Inc.
2740 Valleyview Dr.
Shreveport, LA 71148
(318)-688-1300

FOR OTHER PRODUCT INFORMATION CONTACT:
Specialty Oil Company, Inc.
2740 Valleyview Dr.
Shreveport, LA 71148
(318)-687-8000

SPECIALTY OIL COMPANY
Stihl Chain and Bar

Date Issued: 10/31/90
Supersedes Date: 05/04/88

MATERIAL SAFETY DATA SHEET

Westland Oil Company P.O. Box 8098 Shreveport, LA 71108

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
Stihl Chain and Bar Lubricant

PRODUCT CODE

CHEMICAL NAME
Petroleum Lubricating Oil

CAS NUMBER
Complex Mixture
CAS Number Not Applicable

PRODUCT APPEARANCE AND ODOR
Clear and Bright
Mild Bland Petroleum Odor

EMERGENCY TELEPHONE NUMBER
(318)-687-8000

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stocks	64742-52-5 and 64742-53-6	Greater than 95%
Additive Package		Less than 5%

See Section E for Health and Hazard Information

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity
1	1	0

Hazard Ratings
0-Least 3-High
1-Slight 4-Extreme
2-Moderate

EXPOSURE LIMIT FOR TOTAL PRODUCT
5 mg/m3 for oil mist in air

BASIS
OSHA Regulation 29 CFR 1910.1000

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN

In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)	AUTOIGNITION TEMPERATURE
445+ (COC)	Greater than 600 F

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Westland

HANDLING PRECAUTIONS

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fire involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialtists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials". Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combusion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations. ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (SIGNS AND SYMPTOMS OF EXPOSURE)

Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION

In accordance with the current OSHA Hazard Communication Standard criteria, this product does not require a cancer hazard warning. This is because the product is formulated from base stocks which are severely hydrotreated, severely solvent extracted, and/or processed by mild hydrotreatment and extraction. Alternatively it may consist of components not otherwise affected by IARC criteria, such as vacuum distillates or synthetically derived materials, and as such is not characterized by current IARC classification criteria.

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis. However, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Continuous contact with used motor oil has caused skin cancer in animal tests.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
None Recognized

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Not Determined

SPECIFIC GRAVITY
0.9200

MOLECULAR WEIGHT
Not Determined

pH
Essentially Neutral

POUR, CONGEALING OR MELTING POINT
0 F Pour Point by ASTM D97

VISCOSITY
151 cSt @ 40 C

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20 C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38 C (100 F)

EVAPORATE RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ ATM. AND 25 C (77F)
Negligible: less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochylorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED.

Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302

Not applicable

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372

Not applicable

EPA HAZARD CLASSIFICATION CODE:

Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
					XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS

Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly

after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transporatation Emergency Response Guidebook for Hazardous Materials Incidents. DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Not Applicable

The information and recommendations contained herein are, to the best of Westland's knowledge and belief, accurate and reliable as of the date issued. Westland does not warrant or guarantee their accuracy or reliability, and Westland shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Westland Oil Company, Inc., in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Westland's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
Westland Oil Company, Inc.
2740 Valleyview Dr.
Shreveport, LA 71148
(318)-688-1300

FOR OTHER PRODUCT INFORMATION CONTACT:
Specialty Oil Company, Inc.
2740 Valleyview Dr.
Shreveport, LA 71148
(318)-687-8000

S.C. Johnson Wax
Racine, Wisconsin 53403-5011
Phone: (414) 631-2777
Emergency Phone: (800) 228-5635
Extension 092
International Emergency Phone:
(612) 221-3999 Ext 092

4=Very High
3=High
2=Moderate
1=Slight
0=Insignificant

HAZARD RATING

HMIS		NFPA
1	Health	1
2	Flammability	2
0	Reactivity	0

MATERIAL SAFETY DATA SHEET

SECTION I-PRODUCT IDENTIFICATION

PRODUCT NAME:				PRODUCT CODE:
RAID WASP & HORNET KILLER X				11350-13
CHEMICAL OR COMMON NAME:	DATE ISSUED:	SUPERSEDES:	MSDS SECTIONS WITH CHANGES:	PREPARED BY:
NA	12/22/94	07/19/94	II	Terry A. Meyers Chemical Info. Adm.

SECTION II-INGREDIENT INFORMATION

INGREDIENTS	WEIGHT %	EXPOSURE LIMIT
Petroleum Solvent (CAS# 64742-47-8)	65-75	200 PPM TLV-EXXON RECOMMENDED
Isopropanol (CAS# 67-63-0)	20-30	400 ppm OSHA/ACGIH TWA; 500 ppm OSHA/ACGIH STEL
Carbon Dioxide (CAS# 124-38-0)	1-5	5000 ppm OSHA PEL, ACGIH TLV-TWA
Propoxur (CAS# 114-26-1)	under 0.5	0.5 MG/M3 ACGIH/OSHA TWA
Tetramethrin (CAS# 7696-12-0)	under 0.5	NOT ESTABLISHED

SECTION III-PHYSICAL DATA

APPEARANCE/ODOR: Dispensed as a spray stream with solvent odor	SPECIFIC GRAVITY (H2O=1): 1.07
VAPOR PRESSURE (mm Hg): ND	PERCENT VOLATILE BY VOLUME (%): NA
SOLUBILITY IN WATER: Negligible	VAPOR DENSITY (Air=1): ND
FREEZING POINT (°F): NA	BOILING POINT (°F): ND
pH: NA	EVAPORATION RATE (Butyl Acetate=1): NA
VOC (as packaged, minus H2O): ND	THEORETICAL VOC (lb/gal): ND

SECTION IV-FIRE AND EXPLOSION INFORMATION

FLASH POINT (°F) (Method Used):	S3 (TCC)
FLAMMABLE LIMITS:	NA
EXTINGUISHING MEDIA:	Foam. CO2. Dry Chemical. Water Fog.
SPECIAL FIREFIGHTING PROCEDURES:	Normal fire fighting procedures may be used. Fight fire from maximum distance or protected area. Fire fighters should wear self-contained breathing apparatus and protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	No special hazards known.

MATERIAL SAFETY DATA SHEET

S.C. Johnson Wax 1525 Howe Street Racine, Wisconsin 53403	RAID WASP & HORNET KILLER X Product Number: 11350 Serial Number: 13

SECTION V-HEALTH HAZARD DATA

PRIMARY ROUTE OF ENTRY: Skin contact.

SIGNS AND SYMPTOMS: Direct contact of product with eyes can cause irritation. Prolonged or repeated contact of product with skin may cause irritation. If taken internally, aspiration of liquid product can cause chemical pneumonitis.

FIRST AID PROCEDURES: Flush eyes with water for 15-20 minutes. If irritation persists, seek medical aid. If product gets on skin, remove with soap and water. If product is swallowed, do not induce vomiting. Seek medical aid at once. Notes to physician: Atropine is antidotal and should be administered only after symptoms appear.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE: None known to S.C. Johnson Wax

SECTION VI-REACTIVITY DATA

STABILITY: Stable

STABILITY-CONDITIONS TO AVOID: None known

INCOMPATIBILITY: None known

HAZARDOUS DECOMPOSITION PRODUCTS: When exposed to fire, produces normal products of combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS POLYMERIZATION-CONDITIONS TO AVOID: None known

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wipe up spill with cloth and dispose of properly. Rinse affected area thoroughly with water.

WASTE DISPOSAL INFORMATION: Disposal of regulated quantities should be by incineration at a permitted facility in accordance with all Federal/State regulations and local ordinances regarding disposal of ignitable wastes. Recycle empty aerosol can to nearest steel recycling center. Use up package or give to someone who can.

SECTION VIII-SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If ventilation is adequate, respiratory protection not required.

VENTILATION: For outdoor use only. Do not use indoors or in poorly ventilated areas.

PROTECTIVE GLOVES: If prolonged or repeated contact is possible: Any impervious material.

EYE PROTECTION: Chemical workers splash-proof goggles

OTHER PROTECTIVE MEASURES: Use good personal hygiene practices. Where gross eye/skin contact may be a problem, wear/use appropriate protective equipment.

MATERIAL SAFETY DATA SHEET

S.C. Johnson Wax	RAID WASP & HORNET KILLER X
1525 Howe Street	Product Number: 11350
Racine,Wisconsin 53403	Serial Number: 13

SECTION IX-SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING: CAUTION: Keep out of reach of children. Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes or clothing. Eye contact with product stream may cause severe discomfort. If swallowed, call a physician or poison control center immediately. Gastric lavage is indicated if taken internally. Do not induce vomiting. See Section X.

OTHER HANDLING AND STORAGE CONDITIONS: Product residue may remain on/in empty containers. All precautions for handling the product must be used in handling the empty container and residue. Do not pressurize, cut, heat, weld or expose container to flame; explosion could occur. Wash thoroughly after handling. Keep out of reach of children.

SECTION X-ADDITIONAL INFORMATION

ADDITIONAL INFORMATION: NFPA 30B Level 3 Vomiting may cause aspiration pneumonia. Note to physician: If symptoms of cholinesterase inhibition are present, atropine sulfate is antidotal.

EPA REGISTRATION #: 4822-224

SECTION XI-TRANSPORTATION INFORMATION

DOT CLASS: ORM-D.

DOT #: None

SHIPPING NAME: Insecticides or insect repellents, NOI, other than poison.

SECTION XII-REGULATORY INFORMATION

All components of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

NA-Not Applicable, NE-Not Established, NSR-No Special Requirement, ND-Not Determined

The information herein is given in good faith. No warranty expressed or implied is made. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State, and local laws and regulations. The information contained in this form is confidential and is submitted solely for your organization's internal use.

MATERIAL SAFETY
DATA SHEET

Material Name
Quaker State HD 10W Motor Oil

Issue Date: 11/04/1994
MSDS No.: QS-021

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Chemical Name: Petroleum distillate mixture
Internal Part No.: Order Nos. 03408 (5 gallon); 03410 (55 gallon); 03419 bulk

Manufacturer Information
Quaker State Corporation
P.O. Box 989
Oil City, Pennsylvania 16301
----PHONE #: (814)676-7676
EMERGENCY #: (814)676-7676
Mfg. Part #NA

Supplier Information
None
----PHONE #:
EMERGENCY #:

Sup. Part #NA

Synonyms: Motor Oil

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS #	Components	% Vol
64742-65-0	Petroleum Distillates, Solvent Dewaxed Heavy Paraffinic	80-95
68649-42-3	Zinc C1-C14 alkyldithiophosphate	1-2
84605-20-9	Polyolefin alkene amine	1-5

Component Information/Information on Non-Hazardous Components
This product is not considered a hazardous product under 29 CFR 1910.1200 (Hazard Communication). All mineral oils used in this product have been severely hydrotreated and/or solvent refined.

Section 3 - HAZARDS IDENTIFICATION

Emergency Overview
This product is a viscous amber liquid. It will burn at elevated temperatures (above 400 F). Addition of water or foam to the fire may cause frothing. Use dry chemical or carbon dioxide for small fires, water spray or foam for large fires.

Label Information
WARNING: Continuous contact with used motor oil has caused skin cancer in animal tests. Avoid prolonged contact. Wash skin with soap and water. Launder or discard soiled clothes.

Potential Health Effects

Eyes
This product may cause irritation to the eyes.

Skin
Prolonged or repeated contact with skin may cause mild irritation and possibly dermatitis. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

Ingestion
Low toxicity. Swallowing may cause stomach cramps and diarrhea. Pulmonary aspiration hazard if swallowed.

Continued on next page...

Inhalation
Negligible hazard at room temperature (up to 95 degrees F). High temperatures or mechanical action may form mists or fumes. Inhalation of oil mists or fumes can cause irritation of the nose, throat and upper respiratory tract.

Section 4 - FIRST AID MEASURES

Eyes
Flush eyes with large amounts of water for 15 minutes. If eyes become inflamed, seek medical advice.

Skin
Remove contaminated clothing. Wash affected area with mild soap and water. Launder contaminated clothing before reuse. If leather articles become saturated they should be discarded.

Ingestion
Do not induce vomiting unless instructed to do so by a physician. Call your local poison control center or get medical attention.

Inhalation
Remove to fresh air. If not breathing, give mouth to mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

Notes to Physician
This material, if aspirated into the lungs, may cause chemical pneumonitis; treat the affected person appropriately.

Section 5 - FIRE FIGHTING MEASURES

Flash Point	Method Used
400 deg F (204 deg C)	Cleveland Open Cup

UFL	LFL	Auto Ignition
Not determined	Not determined	Not determined

Flammability Classification	Rate of Burning
IIIB	Not determined

General Fire Hazards
This product is combustible at high temperatures.

Hazardous Combustion Products
Carbon dioxide, carbon monoxide, oxides of sodium, calcium, magnesium, phosphorus, and zinc.

Extinguishing Media
Dry chemical or carbon dioxide for small fires. Water spray or foam for large fires.

Fire Fighting Equipment/Instructions
Wear full set of protective equipment including chemical goggles and gloves. Use water spray to cool fire-exposed containers and as a protective screen. Do not point solid water stream directly into burning oil to avoid spreading.

Continued on next page...

NFPA Ratings: Fire: 1 Health: 1 Reactivity: 0 Other:

HMIS Ratings: Fire: 1 Health: 1 Reactivity: 0
Personal Protection: gloves, glasses/face shield

Section 6 - ACCIDENTAL RELEASE MEASURES

Containment Procedures
Eliminate all sources of ignition or flammables that may come into contact with a spill of this material. Stop the flow of material, if this is without risk.

Clean-Up Procedures
Wear appropriate protective equipment and clothing during clean-up. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps. Scoop up used absorbent into drums. Do not allow the spilled product to enter public drainage systems or open water courses. Surfaces may become slippery after spillage.

Evacuation Procedures
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Special Instructions
Remove soiled clothing and launder before reuse. Avoid skin contact and inhalation of vapors during disposal of spills.

Section 7 - HANDLING AND STORAGE

Procedures for Handling
Avoid getting this material into contact with your skin and eyes. Avoid breathing fumes if this product is used at high temperatures. Avoid the generation of oil mists. Wash hands after handling and before eating. Launder work clothes frequently.

Recommended Storage Methods
Keep the container tightly closed and in a cool, well-ventilated place. Do not store this material in open or unlabeled containers. Store away from strong oxidizers. Empty containers may retain product residue including flammable or explosive vapors. Do not cut, drill, grind, or weld near full, partially full, or empty product containers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines
A. General Product Information
If oil mists are generated, observe the OSHA exposure limit of 5 mg/m3. Protect from skin and eye contact.
B. Component Exposure Limits
No ACGIH, NIOSH or OSHA exposure guidelines listed for this product's components.

Engineering Ctrl.: Use general ventilation. Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face: Wear safety glasses; chemical goggles (if splashing is possible).

Continued on next page...

Skin: Use impervious gloves for prolonged contact or any contact with used oil. The use of neoprene gloves is recommended.
Respiratory: Normally not necessary. If mist is generated (heating, spraying) and engineering controls are not sufficient, wear approved organic vapor respirator suitable for oil mist.
General: Use good hygiene when handling petroleum product.

Section 9 - PHYSICAL & CHEMICAL PROPERTIES

Appearance	: Light amber	Odor	: Mild hydrocarbon
Physical State	: Liquid	pH	: Not applicable
Vapor Pressure	: Negligible	Vapor Density	: Not determined
Boiling Point	: Not determined	Freezing Point	: Not determined
Melting Point	: Not determined	Solubility (H20)	: Negligible in water
Specific Gravity	: 0.87 to 0.88	Particle Size	: Not applicable
Softening Point	: Not determined	Evaporation Rate	: Not determined
Viscosity	: approx. 210 SUS @ 100 F	Bulk Density	: Not determined
Percent Volatile	: Negligible	Molecular Weight	: Mixture

Additional Properties
None

Section 10 - CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability: Stable
Conditions to Avoid: Avoid excessive heat and all sources of ignition.
Incompatibility
Strong oxidizing agents (peroxides, chlorine, strong acids).
Hazardous Decomposition Products
At thermal decomposition temperatures carbon dioxide, carbon monoxide, oxides of calcium, magnesium, phosphorus, and zinc.
Hazardous Polymerization
Hazardous polymerization will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

Acute Toxicity/Target Organ Information
A. General Product/Component Information
Based on similar products the LD50 is expected to be greater than 5,000 mg/kg. Product has the ability to cause oil acne on the skin and fibrosis in the lung.
B. Component LD50/LC50
Epidemiology
No data available for product.
Carcinogenicity
A. General Product/Component Information
No data available on the product as a whole. Note that USED oils tend to contain higher amounts of the cancer-causing aromatics, which have been linked to scrotal and lung cancer in humans.
B. Component Carcinogenicity Listings
None of this product's components are listed by ACGIH, IARC, NIOSH, NTP or OSHA.
Teratogenicity/Reproductive Effects
No data available for the product as a whole. Review of information on components indicates no components at greater than 1.0% have teratogenic effects.

Neurotoxicity
No data available on this product as a whole. Excessive exposure to the oil mist and vapors may cause respiratory tract irritation.
Mutagenicity
No data available on this product as a whole. Review of information on components indicates no components at greater than 1.0% have mutagenic effects.
Other Information
Persons with skin or respiratory conditions may be more sensitive to product.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity
No information is available on ecotoxicity of this product. Keep product out of sewers and waterways.
Environmental Fate
No information is available.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions
A. General Product Information
Product as shipped does not meet the definition or characteristics of a hazardous waste. User must test waste using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.
B. Component Waste Numbers
No EPA Waste Numbers are applicable for this product's components.
Disposal Instructions
Used oil can be returned to a collection center or provided to a licensed recycler. All wastes must be handled in accordance with local, state and federal regulations.

Section 14 - TRANSPORTATION INFORMATION

DOT Information
Shipping Name: Not regulated as a hazardous material
Hazard Class: None
UN/NA #: None
Packing Group: None
Label(s) Required

Additional Shipping Information

International Transportation Regulations
Not regulated as dangerous goods.

Section 15 - REGULATORY INFORMATION

US Federal Regulations
A. General Product Information
All components of this product are listed on the U.S. EPA TSCA Inventory.

Continued on next page...

B. Component Information
None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) or CERCLA (40 CFR 302.4).

State Regulations

A. General Product Information
No components require labeling under California Proposition 65.

B. Component Information
None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Other Regulations

A. General Product Information
This product is not considered a controlled product under the Canadian Controlled Products Act.

B. Component Information
None of this product's components are listed on the Canadian Controlled Product Ingredient Disclosure List.

Section 16 - OTHER INFORMATION

Other Information

This information is, to the best of Quaker State Corporation's knowledge and belief, accurate and reliable. However, no representation, warranty, or guarantee is made to its accuracy, reliability, or completeness. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

Information Preparation: 11/04/94

Key/Legend

NA = Not Applicable; ND = Not Determined; Y = Yes; N = No

Contact Person: D. W. Cralley - Corporate Manager, Health and Safety
Phone: (814)676-7676

End of MSDS #QS-021

SPECTRUM ACQUISITIONS, INC.
P.O. BOX 130
FULGHUM STREET
HORNSBY, TN 38044
(901)658-9050

MATERIAL SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION

PRODUCT TRADE NAME:	Husqvarna 30 Weight Bar & Chain Oil
REVISION DATE:	02/23/90
INFORMATION/EMERGENCY PHONE NO:	(901)658-9050
CHEMICAL FAMILY:	Petroleum Lubricating Oil

SECTION 2 - HAZARDOUS INGREDIENTS

NAME	REGULATORY AGENCY	EXPOSURE LIMIT
Comples Mixture of Petroleum Hydrocarbons	OSHA/ACGIH	5mg/m3 Mist

See Section 6, Chronic Effects, for potential over-exposure hazard.

SECTION 3 - PHYSICAL DATA

VAPOR PRESURE(mmHg):	<1
SPECIFIC GRAVITY:	.94
WATER SOLUBILITY:	Negligible
BOILING POINT:	Wide Range
VAPOR DENSITY (Air=1):	>1
EVAPORATION RATE (BUAC=1):	<1
ODOR:	Mild Hydrocarbon Odor
APPEARANCE:	Amber Colored Liquid

SECTION 4 - FIRE AND EXPLSION HAZARDS

FLASH POINT:	Not Determined
UPPER FLAMMABLE LIMIT:	Not Determined
LOWER FLAMMABLE LIMIT:	Not Determined
EXTINGUISHING MEDIA(s):	Water Fog, Chemical Foam, Dry Chemical Powder, CO_2
SPECIAL FIREFIGHTING PROCEDURES:	Cool exposed containers with water spray. Avoid breathing fumes.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Pressure increase in over heated closed containers. Cool containers

with water spray.

SECTION 5 - REACTIVITY DATA

STABILITY:	Stable
INCOMPATIBILITY:	Avoid strong oxidants.
POLYMERIZATION:	Will not occur.
THERMAL DECOMPOSITION:	Partial burning produces fumes, smoke and carbon monoxide.

SECTION 6 - HEALTH HAZARD DATA

INHALATION:	Inhalation of fumes may result in dizziness, headache and respiratory irritaion.
EYE CONTACT:	Contact with eyes may cause minimal irritaion.
SKIN CONTACT:	Mild irritaion my occur with prolonged or repeated contact.
INGESTION:	Slightly toxic. Pulmonary aspiration hazard if vomiting occurs.
TLV:	5mg/m3 as mist. ACGIH 1984-85
CHRONIC EFFECTS:	Product has a low order of acute oral toxicity. Ingredients of this product are not listed as potential carcinogens in N.T.P. Annual Report on Carcinogens, I.A.R.C. Monographs, or by O.S.H.A. HCS (g) (2) (vii).

Emergency First Aid Procedures

SKIN:	Wash skin with soap and warm water. Wash Clothing before re-use.
EYE:	If splashed into eyes flush eyes with clear water for five(5) minutes.
INHALATION:	If overcome by fumes remove from exposure immediately.
ORAL:	If ingested, do not induce vomiting. Call a physician.

SECTION 7 - SPECIAL PROTECTION INFORMATION

VENTILATION PROCEDURE:	Ventilate as needed to comply with exposure limit.
GLOVES PROTECTION:	Use impervious gloves to avoid repeated/prolonged skin contact.
EYE PROTECTION:	Use goggles/face shield to avoid eye contact.
WORK/HYGENIC PRACTICES:	If clothing becomes contaminated,

	change to fresh clean clothing. Do not wear until thoroughly laundered.

SECTION 8 - SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:	Remove ignition sources. Recover liquid. Add absorbent to spill area. Ventilate confined spaces. Advise authorities if product enters sewers, etc.
WASTE DISPOSAL:	Assure conformity with applicable disposal regulations. Dispose of absorbed material at approved waste site.

SECTION 9 - SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:	Keep containers closed when not in use. Do not handle or store near heat or flames. Use chemical resistant gloves and apron.

The Data presented herein is based upon tests and information which we believe to be reliable. However, users should make their own investigations to determine the suitability of the information for their particular purpose.

FOR CHEMICAL EMERGENCY
SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT
CALL CHEMTREC-DAY OR NIGHT
*800-424-9300
TOLL-FREE IN THE CONTINENTAL U.S.
*ADD LONG-DISTANCE ACCESS NUMBER IF REQUIRED
483-7616 IN DISTRICT OF COLUMBIA
FOR CALLS ORIGINATING OUTSIDE THE CONTINENTAL U.S.:
202-483-7616-WASHINGTON, DC, COLLECT
ALL CALLS ARE RECORDED

SPECTRUM ACQUISITIONS, INC.
P.O. BOX 130
FULGHUM STREET
HORNSBY, TN 38044
(901)658-9050

MATERIAL SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION

PRODUCT TRADE NAME:	Husqvarna 50:1 Two-Cycle Engine Oil
REVISION DATE:	2/11/91
INFORMATION/EMERGENCY PHONE NO:	(901)658-9050
CHEMICAL FAMILY:	Petroleum Lubricating Oil

SECTION 2 - HAZARDOUS INGREDIENTS

NAME	REGULATORY AGENCY	EXPOSURE LIMIT
Complex Mixtrue of Petroleum Base Stocks.	OSHA	5mg/m3 Mist

See Section 6, Chronic Effects, for potenital over-exposure hazard.

SECTION 3 - PHYSICAL DATA

VAPOR PRESSURE(mmHg):	<1
SPECIFIC GRAVITY:	Not Determined
WATER SOLUBILITY:	Negligible
BOILING POINT:	600°F+
VAPOR DENSITY (Air=1)	>5
EVAPORATION RATE(BUAC=1)	<1
ODOR:	Mild Petroleum Odor
APPEARANCE:	Dark Blue Colored Liquid

SECTION 4 - FIRE AND EXPLOSION HAZARDS

FLASH POINT:	475°
UPPER FLAMMABLE LIMIT:	7%
LOWER FLAMMABLE LIMIT:	.09%
EXTINGUISHING MEDIA(s):	Water Fog, Chemical Foam, Dry Chemical Powder, CO_2
SPECIAL FIREFIGHTING PROCEDURES:	Cool exposed containers with water spray. Avoid breathing fumes.
UNUSUAL FIRE & EXPLOSION HAZARDS:	Pressure increase in over heated closed containers. Cool containers with water spray.

SECTION 5 - REACTIVITY DATA

STABILITY:	Stable
INCOMPATIBILITY:	Avoid strong oxidants.
POLYMERIZATION:	Will not occur.
THERMAL DECOMPOSITION:	Partial burning produces fumes, smoke and carbon monoxide.

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INGESTION:	Slightly toxic. Pulmonary aspiration hazard if vomiting occurs.
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EYE:	If splashed into eyes flush eyes with clear water for five(5) minutes.
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EYE PROTECTION:	Use goggles/face shield to avoid eye contact.
WORK/HYGENIC PRACTICES:	If clothing becomes contaminated, change to fresh clean clothing.

	Do not wear until thoroughly laundered.

SECTION 8 - SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:	Remove ignition sources. Recover liquid. Add absorbent to spill area. Ventilate confined spaces. Advise authorities if product enters sewers, etc.
WASTE DISPOSAL:	Assure conformity with applicable disposal regulations. Dispose of absorbed material at approved waste site.

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The Data presented herein is based upon tests and information which we believe to be reliable. However, users should make their own investigations to determine the suitability of the information for their particular purpose.

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202-483-7616-WASHINGTON, DC, COLLECT
ALL CALLS ARE RECORDED

MSDS1614

aterial Safety Data Sheet

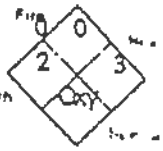
MATERIAL — 1942
UN N° —
CAS N° — 6484-52-2
CIL N° — GCD-0086-84B

Emergency Tel. No

Halifax, N.S. (902) 469-9690
Montreal, Que. (514) 861-1211
Toronto, Ont. (416) 226-6117
Winnipeg, Man. (204) 943-8827
Edmonton, Alb. (403) 424-1754
Vancouver, B.C. (604) 685-5036

HAZARD RATING NFPA
Non-fire
fire

4 - EXTREME
3 - HIGH
2 - MODERATE
1 - SLIGHT
0 - INSIGNIFICANT
* - CHRONIC HEALTH HAZARD SEE SECTION 6



ction I. Identification of Product

ODE NAME & SYNONYMS	CHEMICAL NAME & SYNONYMS
Norway Saltpeter	Ammonium Nitrate
EMICAL AND PHYSICAL STATE Nitrate, solid	MOLECULAR FORMULA NH_4NO_3

CTION II Physical Properties

EARANCE AND ODOUR

Free-flowing, odourless, hygroscopic, white, deliquescent crystals or granules

LING POINT (°C)	MELTING POINT (°C) - FREEZING POINT (°C)
210°C @ 1.47 kPa decomp @ 230°C @ 101.3 kPa	169°C
OUR PRESSURE (MM HG)	SPECIFIC GRAVITY (WATER = 1 AT 4°C)
Not applicable	1.725 at 25°C
K DENSITY	VAPOUR DENSITY (AIR = 1)
Not available	Not applicable
UF Y IN WATER	OTHER SOLVENTS
g/ml of water	Methyl Alcohol, Ethyl Alcohol

ction III Fire and Explosion Hazard Data

SH POINT (°C) METHOD	AUTOIGNITION TEMPERATURE (°C)
Non-flammable	—

MMABLE LIMITS (% BY VOL IN AIR) LOWER — UPPER —

OULD ANY MATERIAL SATURATED WITH THIS PRODUCT OR ITS VAPOURS BE SUBJECT TO SPONTANEOUS COMBUSTION? ☐ YES ☒ NO

E EXTINGUISHING DATA

Water

ECIAL FIREFIGHTING OCEDURES: Controllable fires should be sprayed with water with adequate ventilation to dissipate heat of reaction & toxic gases. Approach should always be made from upwind side. Attempts to smother a fire involving the material are ineffectual as it is its own 'oxygen source'.

USUAL FIRE AND PLOSION HAZARDS: If the fire is out of control, the area should be evacuated in case of detonation. Material will detonate if heated while confined or contaminated. A self-contained breathing apparatus should be worn in a fire. Thermal decomposition may cause the release of toxic oxides of nitrogen.

ction IV Reactivity Data

ABILITY			CONDITIONS TO AVOID
	UNSTABLE	XX	Heating in closed containers, contamination of material
	STABLE		

COMPATIBILITY (MATERIALS TO AVOID): Contact with oxidizable materials &/or metal powders at moderately high temp. will f-ignition. Incompatible with copper, fuels (e.g., lubricants, machine oils), fluorocarbon lubricants, acids, liquids, Chlorates, Sulphur, charcoal, coke and sawdust.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic gases & vapours (oxides of nitrogen) will be released by thermal decompositic (about > 300°C). At higher temperatures, decomposition may be explosive.

ARDOUS YMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	XX	

SHOLD LIMIT VALUE (TLV-TWA) Not available	LC_{50} Not available	AMMONIUM NITRATE .... P. 2

CTS OF EXPOSURE WHEN: INHALED	Allergen, possible faintness & lowered blood pressure. Also see 'Ingested'.
YTACT WITH EYES	Irritation
IN CONTACT WITH SKIN	Irritation
INGESTED	Dizziness, cramps, vomiting, possible methemoglobinemia, weakness, depression, headache
GENCY AND AID PROCEDURES INHALATION	Remove to fresh air. If not breathing, give artificial respiration. Keep warm & at rest. Obtain medical attention.
EYES	Flush eyes with running water for at least 20 minutes, holding eyelids open. Obtain medical attention.
SKIN	Remove contaminated clothing. Flush affected area with running water for 20 minutes. If irritation persists, obtain medical attention.
INGESTION	If conscious, give large amounts of water or milk to induce vomiting. Obtain medical attention.

tion VI — Special Protection Information

LATION REQUIREMENTS	Local ventilation preferred		
RATORY PROTECTION	Air purifying respirator approved by NIOSH/MSHA equipped with dust, mist, fume cartridges, if necessary		
CTIVE GLOVES	Impermeable gloves	EYE PROTECTION	Safety glasses
PROTECTIVE EQUIPMENT	Protective clothing as required		

...n VII — Special Requirements

UTION IN HANDLING TORING	Protect containers against physical damage. Store in cool dry well-ventilated building, preferably noncombustible equipped with automatic sprinkler protection. Floor drains &
UTIONS	recesses should be plugged or eliminated to prevent entrapment of flowing molten nitrate during fire. Separate from incompatibles (See IV) acids, corrosive liquids, organic materials, Chlorates, Sulphur, powdered metals, charcoal, coke, sawdust

...n VIII — Spill or Leak Procedures

TO BE TAKEN IN EVENT OF R RELEASE. IN ALL CASES APPLICABLE GOVERNMENT ITY IF SPILL IS SIGNIFICANT	Stop & contain leak or spill. If in solid form or solution, absorb in earth or sand and shovel into containers for disposal. If contamination has not occurred, collect for reclaim.
ONMENTAL EFFECTS	Contaminated water is toxic to children & cattle. Toxic to fish at low concentrations (4.2 mg/l); aesthetic critical concentration (0.5 mg/l); fish toxicity critical concentrations (300 mg/l); used as fertilizer on land.
ALIZING CHEMICALS	Remove slowly into a large container of water. Add Soda Ash slightly by stirring. After 24 hours, decant or siphon into another container. Neutralize with 6M-HCl.
DISPOSAL	Consult federal, provincial & local regulations on chemical waste disposal. May be possible to neutralize, flush & disperse with large quantities of water. May also be possible to dispose of in a secure sanitary landfill site.

...n IX — References

...X, N.I., Dangerous Properties of Industrial Materials, 5th Ed., Van Nostrand Reinhold, 1979.

...oxic and Hazardous Industrial Chemicals Safety Manual, The International Tech. Info. Inst., Japan, 1979.

"Information contained herein is provided without any warranty, and C-I-L Inc. will not be liable for any damage which may result from the use or reliance on any information contained herein." Before any product is used, the label should be carefully read.

LAVOPTIK COMPANY, INC.
APPROVED BY U.S. DEPARTMENT OF LABOR
"ESSENTIALLY SIMILAR" TO FORM OSHA-20

MATERIAL SAFETY DATA SHEET

SECTION I

FEB 2 6 1987

PRODUCT NAME LAVOPTIK Eye Wash | SIZE 6 and 32 ounce

CHEMICAL NAME Eye Wash

FORMULA gms per 100ml Sodium Chloride 0.49, Sodium Biphosphate 0.40, Sodium Phosphate 0.45, Benzalkonium Chloride .005, Water to 100ml

MANUFACTURER LAVOPTIK COMPANY, INC.

ADDRESS 661 WESTERN AVENUE NORTH ST. PAUL, MN. 55103

FOR INFORMATION ON HEALTH HAZARDS CALL (612) 489-1351

FOR OTHER INFORMATION CALL (612) 489-1351 | INFORMATION EFFECTIVE AS OF 10/1/86

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZAROOUS COMPONENT(S)	%	TLV (Units)
None		

SECTION III PHYSICAL DATA

BOILING POINT (°F) Same as Water | SPECIFIC GRAVITY (H_2O=1) 1

VAPOR PRESSURE (mm Hg) N/A | PERCENT VOLATILE BY VOLUME (%) 98.655%

VAPOR DENSITY (AIR=1) N/A | EVAPORATION RATE (=1) Same as Water

SOLUBILITY IN WATER 100%

APPEARANCE AND ODOR Clear, no odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used) Not Applicable | FLAMMABLE LIMITS | Lel | Uel

EXTINGUISHING MEDIA

SPECIAL FIRE-FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

SECTION V HEALTH HAZARD DATA

.SHOLD LIMIT VALUE

Not Applicable

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST-AID PROCEDURES

SECTION VI REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
N/A	UNSTABLE	
	STABLE	

INCOMPATIBILITY
(Materials to avoid)

HAZARDOUS
DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur	Will Not Occur	

SECTION VII SPILL OR LEAK PROCEDURES

S TO BE TAKEN
ASE MATERIAL IS
EASED OR SPILLED

Safe for humans to handle

WASTE DISPOSAL METHOD

Any Sewer

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION
(Specify Type)

Not Applicable

VENTILATION		
	LOCAL EXHAUST	SPECIAL
	MECHANICAL (general)	OTHER

PROTECTIVE GLOVES	EYE PROTECTION

OTHER
PROTECTIVE
EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE
TAKEN IN HANDLING
AND STORING

Protect from freezing

R PRECAUTIONS

HALLIBURTON

HALLIBURTON ENERGY SERVICES

Explosive Products Center / 8432 South I-35W / Alvarado, Texas 76009-9775 / Tel: 817-783-5111 / Fax: 817-783-5812

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

PRODUCT NAME: SHAPED CHARGE PRODUCTS Revision Date: 9/29/94

TRADE NAMES ANS SYNONYMS

Tubing Cutters, Drill Pipe Cutters, Casing Cutters, Big Hole Charges, Deep Penetrating Charges, Gravel Pack Charges, DYNA-Strip Charges, DYNA-Cap Charges, DYNA-Jet Charges, SSB Charges, Sidewinder Charges, GSC Charges, Junk Shot Charges, Linear Shaped Charges, (LSC) Flexible Linear Shaped Charges (FLSC)

MANUFACTURER: Halliburton Energy Services
Explosive Products Center
8432 South I-35 W
Alvarado, Texas 76009-9775

PRODUCT INFORMATION PHONE: (817) 783-5111
EMERGENCY PHONE: (817) 783-5111
TRANSPORTATION EMERGENCY PHONE: INFOTRAC: (800) 535-5053 U.S. & CANADA

****

HAZARDOUS COMPONENTS

CHEMICAL	Exposure Limits TLV	PEL
Cyclotrimethylenetrinitramine (RDX)	1.5mg/M³	1.5 mg/M³
Cyclotetramethylenetetranitramine (HMX)	NE	NE
Hexanitrostilbene (HNS)	NE	NE
2,6-bis (Picrylamino)-3,5-dinitropyridine (PYX)	NE	NE
Nonanitroterphenyl (NONA)	NE	NE
Desensitizing Wax	NE	NE
Iron	5 mg/M³	10 mg/M³
Copper	1 mg/M³	1 mg/M³
Tin	2 mg/M³	2 mg/M³
Aluminum	5 mg/M³	NE
Corrosion Resistant Steel	NE	NE
Lead	0.15 mg/M³	50 g/M³
Antimony	0.5 mg/M³	0.5 g/M³

NE = Not Established

****

PHYSICAL DATA

Packed powder charges (encased in metal casing).

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HAZARDOUS REACTIVITY

INSTABILITY: May detonate with friction, impact, heat, and low level electrical current.
INCOMPATIBILITY: Acids and aklalis.
HAZARD DECOMPOSITION: Detonation may product shrapnel. Gases produced may contain carbon monoxide and nitrogen oxide. Lead fumes may also be produced.
POLYMERIZATION: Polymerization will not occur.

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FIRE AND EXPLOSION DATA

FLASHPOINT: N/A

EXTINGUISHING MEDIA: None

SPECIAL FIRE FIGHTING PROCEDURES: DO NOT fight fire. Isolate area. Evacuate personnel to a safe area. Guard against intruders. Allow fire to burn itself out.

SPECIAL FIRE FIGHTING PROCEDURES: DO NOT fight fire. Isolate area. Evacuate personnel to a safe area. Guard against intruders. Allow fire to burn itself out.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May detonate with impact or on heating. May explode and throw fragments 1 mile or more if fire reaches cargo. Evacuate all persons, including emergency responders from the area.

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HEALTH HAZARDS

Shaped Charge Products do not present health hazards in normal handling and use. However, the proudcts are Class A or Class C Explosives and detonation may cause severe physical injury, including death. All explosives are dangerous and must be handled carefully and used folooing approved sagety procedures under the direction of competent, experienced perosns in accordance with all applicable Federal, State, and Local Laws, Regulations and Ordinances.

Inhalation of explosive powders may cause nervous system irregularities including headaches and dizziness. May be absorbed through the skin in toxic amounts.

Over exposure to lead may cause adverse effects to the blood forming, nervous, urinary, and reproductive systems incldung weatkness, weight loss, insomnia, constipation, anemia, motor weakness, and encephalopathy. Lead may penetrate the placental barrier and has caused congenital abnomalties in animals. Several animal studies have indicated that hight doses of lead may be carcinogenic.

Nitrogen oxides generated during use are skin, eye and respiratory tract irritants.

CARCINOGENICITY

None of the components of these materials are listed as a carcinogen by NTP, IARC, or OSHA.

OTHER SYMPTOMS AFFECTED

A review of available data does not identify any conditions worsened by exposure to this product.

FIRST AID

INHALATION:

Not a likely route of exposure. If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably by mouth-to-mouth. If breathing is difficult, give oxygen. Seek Prompt Medical Attention.

EYE AND SKIN CONTACT:

Not a likely route of exposure.

INGESTION:

Not a likely routs of exposure.

NOTE: Seek prompt medical attention if detonation caused physical injury.

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SPILL OR LEAK PROCEDURES:

Use appropriate protective equipment. Isolate area and remove sources of friction, impact, heat, low level electrical current, electrostatic or RF energy. Only competent, experienced persons should be involved in clean up procedures. Sweep up with non-sparking tools and remove.

WASTE DISPOSAL

Disposal of in compliance with applicable Federal Regulations under the authority of the Resource Conservation and Recovery Act (40 CFR, parts 260-271).

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SPECIAL PROTECTION INFORMATION

VENTILATION: Use only with adequate ventilation.

RESPIRATORY: NIOSH/MESA approved particle masks for dust and mist.

EYE: Safety glasses or goggles.

GLOVES: Normal work gloves.

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SPECIAL PRECAUTIONS

Keep away from friction, impact and heat. Do Not consume food, drink or tobacco in areas where they may become contaminated with these materials.

STORAGE CONDITIONS

Refer to manufacturer's recommendations and warning for proper storage conditions.

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THE INFORMATION WHICH IS CONTAINED IN THIS DOCUMENT IS BASED UPON AVAILABLE DATA AND BELIEVED TO BE CORRECT. HOWEVER, AS SUCH HAS BEEN OBTAINED FROM VARIOUS SOURCES, INCLUDING THE MANUFACTURER AND INDEPENDENT LABORATORIES, IT IS GIVEN WITHOUT WARRANTY OR REPRESENTATION THAT IT IS COMPLETE, ACCURATE AND CAN BE RELIED UPON. HALLIBURTON ENERGY SERVICES HAS NOT ATTEMPTED TO CONCEAL IN ANY WAY THE DELETERIOUS ASPECTS OF THE PRODUCT LISTED HEREIN, BUT MAKES NO WARRANTY AS TO SUCH. FURTHER, AS HALLIBURTON ENERGY SERVICES CANNOT ANTICIPATE NOR CONTROL THE MANY SITUATIONS IN WHICH THE LISTED PRODUCT OR THIS INFORMATION MAY BE USED BY OUR CUSTOMER, THERE IS NO GUARANTEE THAT THE HEALTH AND SAFETY PRECAUTIONS SUGGESTED WILL BE PROPER UNDER ALL CONDITIONS. IT IS THE SOLE RESPONSIBILITY OF EACH USER OF THE LISTED PRODUCT TO DETERMINE AND COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE LAWS AND REGULATIONS REGARDING ITS USE. THIS INFORMATION IS GIVEN SOLELY FOR THE PURPOSES OF SAFETY TO PERSONS AND PROPERTY. ANY OTHER USE OF THIS INFORMATION IS EXPRESSLY PROHIBITED. GOVERNMENT REGULATIONS DEPARTMENT, HALLIBURTON SERVICES.

The
Ensign-Bickford
Company

Blasting Products Division
660 Hopmeadow Street
Simsbury, Connecticut 06070 USA
(203) 658-4411

Telex: 710 436 5050

Material Safety Data Sheets

Section I	
Manufacturer's Name The Ensign-Bickford Company	Emergency Telephone No. 1-203-658-4411
Address (Number,Street,City,State,Zip Code) 660 Hopmeadow Street, Simsbury, CT 06070	
Chemical Name & Synonyms NOT A CHEMICAL	Trade Name & Synonyms PRIMACORD © DETONATING CORD
Chemical Family N/A	Formula N/A / C.A.S. Number

Section II - Hazardous Ingredients	
Ingredient PENTAERYTHRITOL TETRANITRATE (PETN)	Percent
T.L.V.:	P.E.L.:
Ingredient CYCLOTRIMETHYLENE TRINITRAMINE (RDX)	Percent
T.L.V.:	P.E.L.:
Ingredient CYCLOTETRAMETHYLENE TETRANITRAMINE (HMX)	Percent
T.L.V.:	P.E.L.:
Ingredient 2,6-BIS(PICRYLAMINO)-3,5-DINITROPYRIDINE (PYX)	Percent
T.L.V.:	P.E.L.:

Manufactured By: THE ENSIGN-BICKFORD COMPANY

Section III - Physical Data			
Boiling Point:	N/A	Specific Gravity:	N/A
Vapor Pressure:	N/A	Percent Volatile:	N/A
Vapor Density:	N/A	Evaporation Rate:	N/A
Solubility in Water:	N/A	Melting Point:	N/A
Appearance and Odor	CORE OF HIGH EXPLOSIVE WRAPPED IN TEXTILES AND/OR PLASTIC. THE CORE WILL CONTAIN 15-400 GR/FOOT OF ANY ONE OF THE LISTED EXPLOSIVES		

Section IV - Fire and Explosion Hazard Data				
Flash Point:	N/A (F)	Flamm.:	Lel:	Uel:
Extinquishing Media:	NONE			
Special Firefighting Procedures	DO NOT FIGHT FIRE. ISOLATE AREA. EVACUATE PERSONNEL TO A SAFE PLACE.			
Unusual Fire and Explosion Hazards	MAY DETONATE IF OTHER OUTSIDE INFLUENCES ARE PRESENT. HAZARDOUS GASES PRODUCED IN A FIRE ARE NITROGEN OXIDES.			
Auto Ignition Temperature:	N/A			

Section V - Health Hazard Data

Threshold Limit Value:	NOT ESTABLISHED

Effects of Overexposure

Eye Contact :	N/A - NOT A LIKELY ROUTE OF EXPOSURE
Skin Contact :	N/A - NOT A LIKELY ROUTE OF EXPOSURE
Inhalation:	N/A - NOT A LIKELY ROUTE OF EXPOSURE
Ingestion :	N/A - NOT A LIKELY ROUTE OF EXPOSURE

Emergency and First Aid Procedures

Eye Contact :	N/A
Skin Contact :	N/A
Inhalation:	IF DETONATION FUMES ARE INHALED REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH TO MOUTH. IF BREATHING IS DIFFICULT GIVE OXYGEN. CALL A PHYSICIAN.
Ingestion :	N/A

Section VI - Reactivity Data	
Stability: STABLE	
Conditions to Avoid:	DETONATING CORDS BECOME LESS STABLE WITH HEAT. UNSTABLE WITH SHOCK.
Incompatability :	INCOMPATIBLE WITH ACIDS, ALKALIES.
Hazardous Decomp. Products :	HAZARDOUS GASES PRODUCED ARE NITROGEN OXIDES.
Hazardous Polymerization:	WILL NOT OCCUR
Conditions to Avoid:	HEAT, SHOCK. AVOID BREATHING FUMES FROM DETONATION.

Section VII - Spill or Leak Procedures	
Steps to be Taken In Case Material is Released or Spilled:	REVIEW FIRE & EXPLOSION HAZARDS AND SAFETY PRECAUTIONS BEFORE PROCEEDING WITH CLEAN UP. USE APPROPRIATE PERSONAL PROTECTION EQUIPMENT DURING CLEAN UP.
Waste Disposal Method :	CONSULT AN EXPLOSIVES MANUFACTURER FOR RECOMMENDED METHODS FOR DESTROYING EXPLOSIVE MATERIALS.

Section VIII - Specical Protection Information

Respiratory Protection	:	NONE
		Ventilation
Local Exhaust	:	N/A
Special	:	N/A
Mechanical	:	N/A
Other	:	N/A
Protective Gloves	:	NONE
Eye Protection	:	SAFETY GLASSES
Other Protective Equipment	:	NONE

Section IX - Specical Precautions

Precautions To Be Taken in Handling and Storing, Etc.	:	TRANSPORTATION AND STORAGE MUST BE IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS
Other Precautions	:	REFER TO MANUFACTURER'S INSTRUCTIONS AND WARNINGS SUPPLIED WITH PRODUCT.

Data Sheet Prepared By: E.L. STEARNS
Last Data Sheet Revision:

*** IDENTIFICATION ***

MSDS RECORD NUMBER: 773649
PRODUCT NAME(S): ELECTRIC BLASTING CAPS
DUPONT SPECIALTY ELECTRIC DETONATORS - "E" PRODUCTS
PRODUCT IDENTIFICATION: MSDS NUMBER: CEC01127

*** MATERIAL SAFETY DATA ***

Trade names and Synonyms
ELECTRIC BLASTING CAPS
E - ***
*** = Number and/or Letter Designation of Product

PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES

The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember they are dealing with a powerful force and various devices and methods have been developed to assist them in directing this force. The user should realize this force, if misdirected, may either kill or injure.

WARNING

All explosives are dangerous and must be carefully handled and used following approved safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable Federal, State and local laws regulations and ordinances. If, after carefully reading the "Always and Never" and "Instructions and Warnings" leaflets inserted in each case of these products, you have any questions or doubts as to how to use any explosive product, do not use it before consulting your supervisor. If your supervisor has any questions or doubts, they should consult the manufacturer before use. See "Additional Information and References" below.

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Pentaeryhritol Tetranitrate (PETN)	78-11-5	
Lead Azide	13424-46-9	
Lead Dinitroorthocresylate	79357-62-3	
Smokeless Powder		
Lead Styphnate	15245-44-0	
Hexnitrostilbene (HNS II)	109-27-3	
Tacot	25243-36-1	
Boron	7440-42-8	
Ferric Oxide	1309-37-1	
Magnesium	7439-95-4	
Tellurium Dioxide	7446-07-3	
Cyclotrimethylenetrinitramine (RDX)	121-82-4	
Barium Peroxide	1304-29-6	

HAZARDS IDENTIFICATION

Potential Health Effects

DuPONT SPECIALTY ELECTRIC DETONATORS - "E" PRODUCTS and their components do not present health hazards in normal handling and use. The components that make up the article are contained the shell and include explosive materials such as Tacot, Boron, Hexnitrostibene (HNS II), Smokeless Powder, Pentaeryhritol Tetranitrate (PETN), Lead Azide, Magnesium, Ferric Oxide, Lead Dinitroorthocresylate, Lead Styphnate, Tellurium Dioxide, Cyclotrimethylenetrinitramine (RDX), and Barium Peroxide. Under reasonable foreseeable conditions of use, there is no exposure to these materials.

Upon detonation, decomposition products released may include Nitrogen Oxides and fumes of Lead, Barium, Iron, Magnesium

Boron and Tellurium. These materials have the following hazards:

Nitrogen Oxides: Are skin, eye and respiratory system irritants.
Overexposure to Lead compounds may cause abnormal blood forming system function with anemia. Higher exposure may lead to abnormal kidney function with reduced urine volume, abnormal laboratory tests or edema; nervous system effects.
Symptoms may include loss of appetite, anemia; disturbance of sleep and fatigue. Tests of some lead compounds for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive, with positive results in some studies, and negative results in others. Some studies suggest that lead compounds may have developmental toxicity at dosage levels showing maternal toxicity; while some tests
with lead compounds in animals demonstrate reproductive toxicity. DuPont handles lead compounds as potential developmental toxins. Women of childbearing potential should be warned of the risk to the fetus in operations involving direct exposure to lead compounds.
For exposure longer than 8 hours, the OSHA Exposure limit is reduced by this formula:
Exposure limit (in ug/m3) = 400 /hours worked in the day.
Tellurium Oxide has caused adverse liver and kidney effects in laboratory animals. Exposure can lead to to a metallic taste in the mouth and a garlic odor on the breath. Studies in laboratory animals have shown adverse effects to the nervous system.
Barium salts cause muscle paralysis, alteration of the hearts electrical activity with irregular pulse, palpatations or inadequate circulation.
Overexposure to Magnesium by inhalation, ingestion, or skin or eye contact may initially include: skin irritation with discomfort or rash; eye irritation with discomfort, tearing, blurring of vision; irritation of mucosal surfaces; or metal fume fever.
Overexposure to Iron Oxide by: Eye contact may initially include; mild eye irritation with discomfort, tearing, or blurring of vision. Inhalation may initially include; irritation of the upper respiratory passages, with coughing and discomfort; or deposition of iron in the lung tissue resulting in discoloration but without fibrosis or significant symptoms.
Over exposure to Boron and Boron Oxides may cause eye, nose or throat irritation.
Carcinogenicity Information
The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens. A "P" indicates a proposed carcinogen.

Material	IARC	NTP	OSHA	ACGIH
Lead Azide				X
Lead Styphnate				X

FIRST AID MEASURES

Get medical attention immediately if explosion causes physical injury. If decomposition fumes are inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

FIRE FIGHTING MEASURES

Flammable Properties
Detonates when exposed to heat or flame.
Fire and Explosion Hazards:
Hazardous gases/vapors produced in fire are Boron, Iron, Magnesium, Lead and Tellurium compounds, Carbon Monoxide and Nitrogen Oxides. Products are Class A or Class C Explosives (DOT). Will detonate with friction, impact, heat, low level electrical current or electrostatic energy. Detonation produces shrapnel.

Extinguishing Media None
Fire Fighting Instructions
Evacuate personnel to a safe area. Do not fight fire. Isolate area. Guard against intruders.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.
Accidental Release Measures
Control access to area and remove sources of friction, impact, heat, low level electrical current, electrostatic or RF energy. Refer to manufacturer's "Always and Never" and "Instructions and Warnings" supplied with each product shipment.

HANDLING AND STORAGE

Handling (Personnel)
Avoid breathing fumes for detonation.
Storage
Refer to manufacturer's "Always and Never" and "Instructions Warnings" supplied with each shipment.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls
Use only with adequate ventilation. Keep away from friction impact, heat, low level electrical current, electrostatic or RF energy. Do not consume food, drink or tobacco in areas where they may become contaminated with material. Refer to the manufacturer's "Always and Never" and "Instructions and
Warnings" supplied with each product shipment. See also OSHA Lead Standard 29 CFR 1910.1025.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face: Safety Glasses.
Additional: Cotton socks and conductive soled shoes,floors and surfaces.

Exposure Guidelines

Exposure Limits

DUPONT SPECIALTY ELECTRIC DETONATORS - "E" PRODUCTS

PEL (OSHA): Particulates (Not Otherwise Regulated) 15 mg/m3, 8 Hr. TWA, total dust
5 mg/m3, 8 Hr. TWA, respirable dust

Other Applicable Exposure Limits

Lead Azide PEL (OSHA): 0.05 mg/m3, 8 Hr. TWA, as Pb for > 8 Hrs. exposure, limit in mg/m3 = 0.4 divided by hours worked.
TLV (ACGIH): 0.15 mg/m3, 8 Hr. TWA, as Pb
Notice of Intended changes 1993-1994
Lead, elemental, and inorganic compounds as Pb
0.05 mg/m3, A3 AEL * (Du Pont) : "See Human Health Effects Section"
Ferric Oxide PEL (OSHA): 10 mg/m3, as Total Particulate- 8 Hr TWATLV (ACGIH) : B2, 5 mg/m3, as Fe, 8 Hr. TWA
(See Appendix B 1992-93 TLV Booklet)
AEL * (Du Pont): None Established
Cyclotrimethylenetrinitramine (RDX)
PEL (OSHA): None Established
TLV (ACGIH): 1.5 mg/m3, 8 Hr. TWA, Skin
AEL * (Du Pont): None Established
* AEL is Du Pont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are
lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data
Aluminum or Bronze shells with attached insulated Copper or Iron leg wires.

STABILITY AND REACTIVITY

Chemical Stability
Unstable with heat. Unstable with shock. Unstable with staticcharges. Detonates with friction, low level electrical current,

electrostatic or RF energy.

Incompatibility with Other Materials
Incompatible with acids and alkalies.

Decomposition
Decomposes with heat. Decomposes with shock. Hazardous gases/vapors produced are Boron, Iron, Magnesium, Tellurium and Lead compounds, Carbon Monoxide and Nitrogen Oxides. Detonation produces shrapnel.

Polymerization
Polymerization will not occur.

TOXICOLOGICAL INFORMATION

No Information Available

ECOLOGICAL INFORMATION

No Information Available

DISPOSAL CONSIDERATIONS

Waste Disposal

Consult explosive manufacturer for recommended methods of destroying explosive materials. Comply with applicable Federal, State and Local Regulations.

TRANSPORTATION INFORMATION

Shipping Information
Shipping Information depends on packaging and product characteristics. Check manufacturer or shipper for specific information.

OTHER INFORMATION

Additional Information

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. It is obviously impossible to include warnings or approved methods for every conceivable situation. A list of suggestions to aid in avoiding the more common causes of
accidents is set forth in the "Always and Never" and "Instructions and Warnings" included as case

inserts with the product. Additional information is available in the
Blasters' Handbook, published by Explosives Technology International, Inc., Ordnance Safety Manual, published by the U.S. Army Ordnance Department, and the Institute of
Makers of Explosives Safety Library Publications. Copies of
these IME publications may be obtained by writing the Institute of Makers of Explosives, 1120 19th Street, N.W., Suite 510, Washington, D.C. 20036-3605, or from your explosives supplier:

IME publication subjects:

- o Storage Magazines
- o Table of Distances
- o Use and Handling of Explosives
- o RF Hazards
- o Destruction of Commercial Explosives
- o Transportation