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APPENDIX C

OF THE

WORK PLAN

FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

SITE 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:

EODT
EOD TECHNOLOGY, INC.

2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

TABLE OF CONTENTS

Note: EODT will submit Site-specific maps in this Appendix upon generation of the site-specific WP addendum.

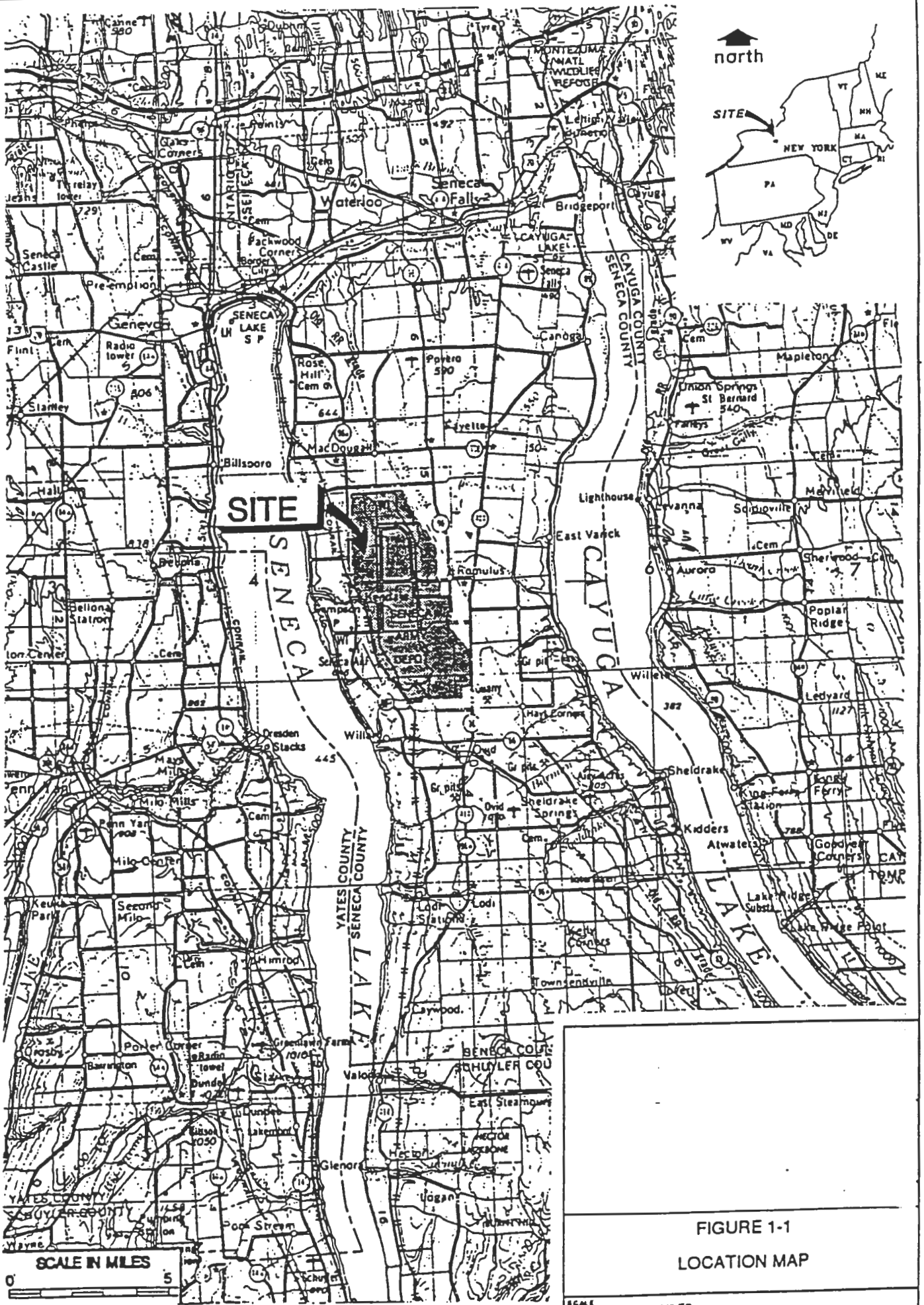

FIGURE 1-1

LOCATION MAP

SCALE 1" = 4 MILES

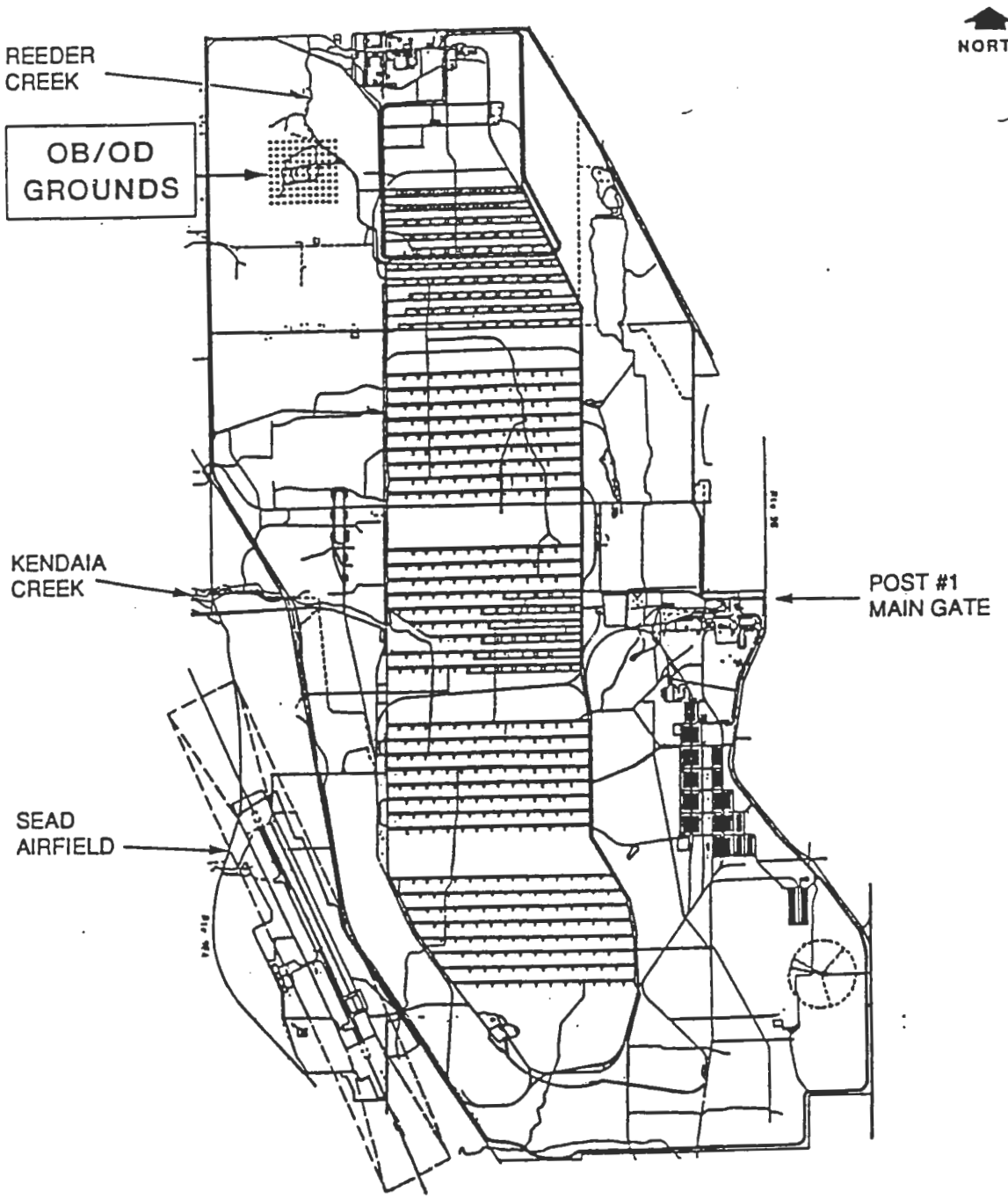

FIGURE 1-2

SENECA army DEPOT MAP

SCALE 1" = 3000' (APPROXIMATE)

SOURCE: Seneca Army Depot

APPENDIX D

OF THE

WORK PLAN

FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

POINTS OF CONTACT

Contract Number: DACA87-97-D-0005
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Prepared For:

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2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

POINTS OF CONTACT

1. EMERGENCY SERVICES---911

Hospital (non-trauma): Geneva General Hospital ..... (315) 798-4222

Hospital (trauma): Syracuse University Hospital ..... Contact to be made by ambulance

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

Fred Wissel, Project Manager ..... (256) 895-1443

Sharon Butler, Contracting Officer ..... (256) 895-1136

TBD , Safety Officer ..... TBD

Kevin Healy, Lead Engineer ..... (256) 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

Doug Murray, Project Manager ..... (423) 988-6063

Andrew Bryson, CIH, Program Safety/Training ..... (423) 988-6063

Michael Short, QA/QC Manager ..... (423) 988-6063

Salvatore Molle, Senior UXO Supervisor/Site Manager ..... (423) 988-6063

APPENDIX E

OF THE

WORK PLAN

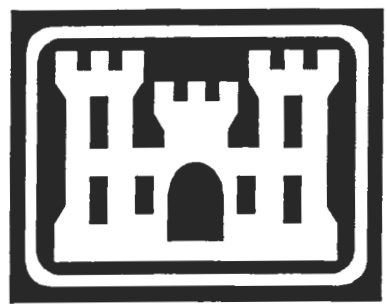
FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

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:

2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

TABLE OF SAMPLE FORMS

or afety aff only)	REPCAT 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)

ACCIDENT CLASSIFICATION

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

PERSONAL DATA

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

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)

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:

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)

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

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

BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE)
IMARY			
CONDARY	(CODE)	TYPE	(CODE)
NATURE OF ILLNESS / INJURY	(CODE)	SOURCE	(CODE)

PUBLIC FATALITY (Fill in line and corresponding code number in box - see instructions)

ACTIVITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED?
		☐ YES ☐ NO ☐ N/A

MOTOR VEHICLE ACCIDENT

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

PROPERTY/MATERIAL INVOLVED

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

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

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

ACCIDENT DESCRIPTION (Use additional paper if necessary)

CAUSAL FACTOR(S) *(Read Instruction Before Completing)*

(Explain YES answers in item 13)	YES	NO
ESIGN: Was design of facility,workplace or equipment a factor?	☐	☐
PECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
ERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
PERATING PROCEDURES: Were operating procedures a factor?	☐	☐
OB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
UMAN FACTORS: Did any human factors such as, size or strength of person, etc.,contribute to accident?	☐	☐
NVIRONMENTAL 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

TRAINING

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)*

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)*

DIRECT CAUSE

NDIRECT CAUSE(S)

ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).

CRIBE FULLY:

DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

EGINNING *(Month/Day/Year)* / /	b. ANTICIPATED COMPLETION *(Month/Day/Year)* / /

GNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYMBOL
PS _____	___ / ___ / ___		
TRACTOR _____	___ / ___ / ___		

MANAGEMENT REVIEW *(1st).*

☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

IATURE	TITLE	DATE

MANAGEMENT REVIEW *(2nd - Chief Operations, Construction, Engineering, etc.)*

☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

ATURE	TITLE	DATE

SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS:

ATURE	TITLE	DATE

COMMAND APPROVAL

MENTS

MANDER SIGNATURE	DATE

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.)

RE… do… juri… of … (See…

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	All other occupational illnesses	Fatalities: Illness Related	Nonfatal Illnesses: 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, no… activity employee was per… forming when injured or at… onset of illness. In the abs… of a formal title, enter a b… description of the employe… duties.		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)		(8)	(9)	(10)	(11)	(12)	(13)

Date ______

★U.S.GPO:1990-262-258/154

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 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 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 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 SITE MONITORING LOG

Operation: _____

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

TYPE OF MONITORING AND RESULTS

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

Instrument Information

	Make	Model	Serial Number	Cal. Date

General Remarks and Observati

EODT SITE SPECIFIC CHEMICAL INVENTORY FORM

	Contract No.:	Delivery Order N

oduct Name	Supplier's Name and Address	Hazardous Chemicals	Training Given

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
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
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

gnature 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 PERSONAL PROTECTIVE EQUIPMENT TRAINING LOG

_____ First MI	Employee No.: _____	SSN: _____ - _____

mation below certifies that the employee listed above has successfully completed the required PPE training specified. This training has inclu
nd what PPE is needed; how to don, doff, adjust and wear the PPE; limitations of the PPE; and care, maintenance, useful life and disposa

Type of PPE	Site Where Trained	Date	Type of PPE	Site Whe
lasses				
t				
s: Type:				
fs: Type:				
Gloves				
Boots				
ed Boots				
ield				
eggings				
tectors				

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

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)			

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 SURVEY SUMMARY LOG FOR OE OPERATIONS

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

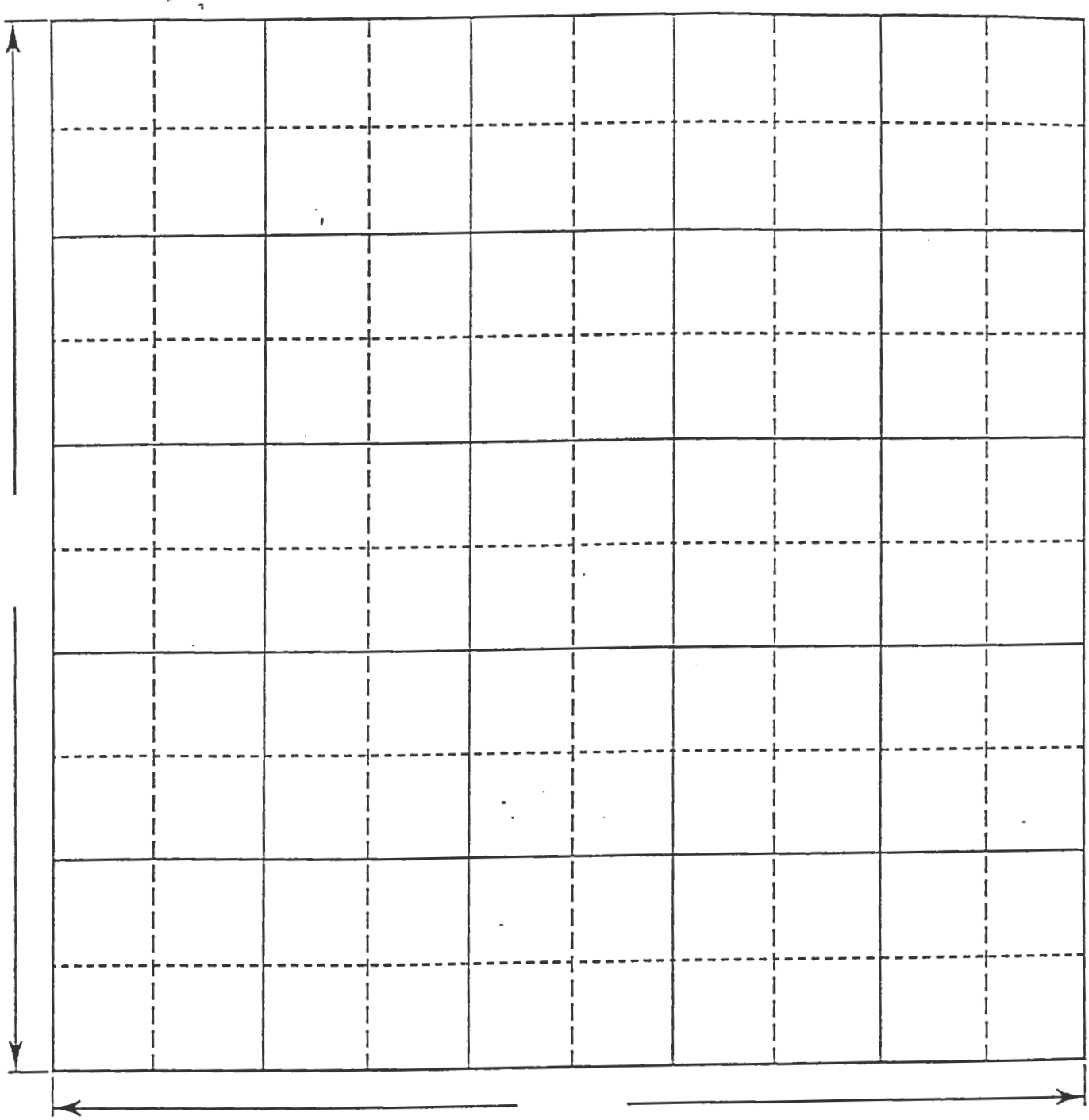
	LOCATION:	GRID NO.:	P
	DELIVERY ORDER NO.:	TEAM LEADER:	

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

EODT OE OPERATIONS GRID MAP

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

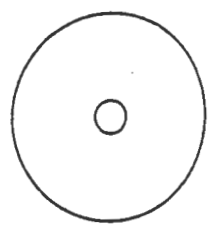
DATE: _____ GRID NO.: _____



NOTES: _____

LEGEND

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



Map Orientation

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:	

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: _____

EODT OUTGOING CORRESPONDENCE LOG

Brief Description of Title / Subject	Sent By	Sent To	
		Name	Organizati

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: ______________________________

____

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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 DOCUMENT CONTROL REGISTER

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

EODT EXPLOSIVES PURCHASE/RECEIPT AUTHORIZATION LIST

.ddress and County: _____

_____

_____

'ederal 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 CALIBRATION / RESPONSE CHECK LOG

	Contract No.:	Delivery Order No.:	QCS:

Serial Number	Calibration / Response Check Test Date															
	Initials of Person Conducting Calibration / Response Check															

APPENDIX F

OF THE

WORK PLAN

FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

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:

EODT
EOD TECHNOLOGY, INC.

2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

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
- Doug Murray, 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.

Specific projects include:

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 60,000[3] 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.

RFP Requirements: Program Manager	***Mr. Bleke's Qualifications: Program Manager***
• 3 Years in General Contract Project Management • Experience should be on Programs Similar in Size and Complexity to the Effort Described in the SOW	• Over 16 years experience, including 12 years in project management. • Managed multi-million dollar programs totalling $50 million.

DOUGLAS L. MURRAY
PROJECT MANAGER

CITIZENSHIP	**USA**
GRADUATED FROM INDIAN HEAD	**September 3, 1980**
MILITARY EOD EXPERIENCE	**13.0 YEARS**
COMMERCIAL UXO EXPERIENCE	**2.92 YEARS**

EDUCATION/TRAINING

- First Aid/CPR (1998)
- HAZWOPER Annual Refresher Training Courses (1997/98)
- Hazardous Waste Site Operations and Emergency Response (HAZWOPER) Course, Roane State Community College, Oak Ridge, Tennessee (1996)
- Hazardous Materials Incident Response Operations Course, EPA Office of Emergency and Remedial Response, Washington, D.C. (1996)
- Numerous Hazardous Waste Management Courses, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio (1991-94)
- Basic EOD School, Indian Head, Maryland (1980)
- M.A., Psychology, University of Northern Colorado, Greeley, Colorado (1979)
- B.S., Chemistry, University of Maryland, College Park, Maryland (1977)

PROFESSIONAL EXPERIENCE

9/80-8/93 Explosive Ordnance Disposal Officer, United States Air Force

- TSDF Operations
  - — Operations manager of the Air Force's largest OB/OD Treatment Storage and Disposal Facility (TSDF), treating more than 1.2 million pounds of waste munitions a year with 86 EOD technicians.
  - — Wrote detailed treatment procedures and developed safety, training, and quality assurance programs. Also ensured worker compliance with OSHA.
  - — Designed a replacement TSDF to treat munitions as diverse as rocket motors weighing over 100,000 pounds each, hard-cased bombs, and uncased explosives.
  - — Developed a sampling and monitoring protocol for ash, air, and soil media.
- Munitions Demilitarization Operations
  - — Supervised the demilitarization of chemical warfare munitions in the field.
  - — Supervised the demilitarization of live explosive ordnance in preparation for shipment to reverse engineering and disassembly facilities.
- Site Remediation
  - — Led numerous teams clearing explosive residue from bombing and gunnery targets on ranges

in Arizona, Italy, New Mexico, and Utah. In Utah, he averaged over 5,000 acres annually. Operations included surface sweeps as well as *in situ* neutralization of buried UXO.

— Co-designed a one-of-a-kind plant to extract plutonium from contaminated soil at Johnston Atoll in the Pacific. Fully characterized extent of contamination and assisted in plant set up. Operations resulted in a 99.99% clean soil recovery rate.

— Organized and executed restoration of two 500-acre sites contaminated with explosive and chemical ordnance residue. Conducted site surveys, oversaw writing of the EPA-required studies, obtained required resources, appeared before the media with concerned citizen's environmental groups, and directed site remediation.

— Author of DoD standards on remediating explosively-contaminated property prior to turning over land to the public under the Base Realignment and Closure process.

5/96-10/98 UXO Project Manager, Munitions, Energetics and Demilitarization Team, Radian International, Oak Ridge, Tennessee

- Supporting DoD Bombing/Gunnery and OB/OD Ranges
  — Provided unexploded ordnance (UXO) avoidance services during intrusive activities at three Army, two Air Force, and one Marine Corps OB/OD facilities.
  — Identified and cataloged waste munitions residue remaining on Army gunnery ranges following training activities, determining which were already characterized under RCRA and which needed characterization in order to properly manage as solid or hazardous waste.
- Writing RCRA Subpart X Permits
  —Wrote Part B operating permit applications for Army and Air Force OB/OD ranges.
  — Authored an Explosive Safety Submission for a Navy bombing and gunnery range.
  — Wrote an analysis of munition emissions factors following OB/OD operations and devised groupings, or "families," of explosives into which various munitions fell. This aided four DoD installations in obtaining required RCRA permits without limiting their operations to specific ordnance lists.
- Managing Unserviceable Munitions
  — Assisted the Headquarters, Department of the Army in writing implementing instructions for the EPA Munitions Rule.
  — Determined the safest and least expensive means to dispose of several Sea Lance missile motors held by the manufacturer after termination of the missile procurement program.
  — Conducted an analysis of DoD's 127 RCRA permitted or interim status OB/OD TSDF units, evaluating each in terms of its capability and capacity, and making recommendations on their continuance or closure.
  — Wrote for the U.S. Army a "How-to Book," designed for installation managers to determine the requirements for and effectiveness of their OB/OD units, including step-by-step instructions on how to terminate their permit application and close their unit, if required.
  — Authored the DoD's first-ever regulatory audit protocol for unserviceable munitions.
  — Developed an in-depth waste munitions management plan, together with standard operating procedures, for an Air Force and an Army installation.

11/98-Present UXO Project Manager, EOD Technology, Inc., Lenoir City, Tennessee

- Provided simultaneous project management support for up to three Ordnance and Explosives (OE) removal operations in support of the Huntsville Center, Corps of Engineers.
  — This included all pricing, task sequencing, planning, personnel management, execution, and report writing activities.

EOD/UXO-RELATED ASSIGNMENTS

11/98-Present	UXO Project Manager, EODT, Inc., Lenoir City, Tennessee.
5/96-10/98	UXO Project Manager, Munitions, Energetics and Demilitarization Team, Radian International, Oak Ridge, Tennessee.
7/91-8/93	Air Force EOD Program Manager, Office of the Civil Engineer, Headquarters Air Force, Pentagon, Washington. D.C.
7/88-7/91	Commander, 2701st EOD Squadron, Hill Air Force Base, Utah.
7/85-7/88	EOD Staff Officer, Defense Nuclear Agency, Kirtland Air Force Base, New Mexico.
7/83-7/85	EOD Program Manager, Headquarters United States Air Forces in Europe, Ramstein Air Base, Germany
9/80-7/83	Commander, 7004th EOD Flight, Aviano Air Base, Italy.

PROFESSIONAL REGISTRATIONS

1993 Registered Environmental Manager (Illinois)

PROFESSIONAL AFFILIATIONS

- International Association of Bomb Technicians and Investigators (IABTI), 1988-Present.
- Society of American Military Engineers (SAME), 1993-Present.
- The EOD Masterblasters, 1992-Present.

ANDREW L. BRYSON, JR.
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. 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 site 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.*

RFP Requirements: Program Safety and Training	*Mr. Bryson's Qualifications: Program Safety and Training*
• *Bachelor degree in Safety, Health, or related field.* • *Board-Certified in Industrial Hygiene* • *2 Years Experience*	• *Master of Public Health, Occupational & Environmental Health and Safety* • *Certified Industrial Hygienist* • *7 Years Professional Experience*

MICHAEL E. SHORT
QUALITY CONTROL MANAGER

CITIZENSHIP	**USA**
GRADUATED FROM INDIAN HEAD	**1967**
MILITARY EOD EXPERIENCE	**8 YEARS**
COMMERCIAL UXO EXPERIENCE	**5 YEARS**
RELATED EXPLOSIVE EXPERIENCE	**30 YEARS**

EDUCATION/TRAINING

- OSHA 8 Hour Refresher Hazardous Waste Site Workers Course (1992/93/94/95/96/97/98)
- 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)

CIVILIAN EOD/UXO ASSIGNMENTS:

10/91-Present	EOD Technology, Inc., Knoxville, Tennessee, Vice President/Director of Operations/Program Manager & Project Manager
05/93-09/94	EOD Technology, Inc., Knoxville, Tennessee, Director of Engineering Services
10/91-01/92	Corporate Safety, QA/QC and Training Manager, EOD Technology, Inc.
07/91-09/91	Site Safety and Health Officer, EOD Technology, Inc., Macon, GA
04/91-07/91	Site Safety and Health Officer, EOD Technology, Inc., Biwabik, MN
06/87-12/89	Instructor, EIC Course, Oklahoma City, Oklahoma and Baton Rouge, Louisiana

MILITARY EOD/UXO ASSIGNMENTS:

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

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)

SALVATORE A. MOLLE
SENIOR UXO SUPERVISOR

CITIZENSHIP	**USA**
GRADUATED FROM INDIAN HEAD	**1975**
MILITARY EOD EXPERIENCE	**12.83 YEARS/USN**
COMMERCIAL UXO EXPERIENCE	**3.75 YEARS**

EDUCATION/TRAINING

- *U. S. 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 (1994/95/96/97/98)*

MILITARY EOD/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 U. S. 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 U. S. 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 U. S. Navy Philippines. Live fire range safety and EOD officer.*

01/88-08/89 *EOD School, Indian Head, Maryland. Demo range officer for NAVSCOL EOD.*

CIVILIAN EOD/UXO ASSIGNMENTS

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. Former Raritan Arsenal, Edison, NJ. EODT's U. S. Army Corps of Engineers Huntsville Division's OEW Remediation East of the Mississippi Program.*

04/94-04/94 *UXO Specialist. Former Raritan Arsenal, Edison, NJ. EODT's U. S. Army Corps of Engineers Huntsville Division's OEW Remediation East of the Mississippi Program.*

06/94-06/94 *UXO Supervisor. Former Raritan Arsenal, Edison, NJ. Roy F. Weston's U. S. Army Corps of Engineers Environmental Program.*

03/95-05/95 *Sr. UXO Supervisor/Field Operations Manager. Camp Green, Charlotte, NC. Environmental Science and Engineering EE/CA Program - CEHNC.*

11/95-12/95 *Senior UXO Supervisor/Field Operations Manager. Barry M. Goldwater Bombing Range, Gila Bend, AZ. Dame & Moore AFCEE Program.*

05/95-9/95 *Senior UXO Supervisor/Project Manager/UXO Site Manager, EOD Technology, Inc., Picatinny Arsenal, Dover, NJ - ICF Kaiser. Supervised and managed soil sampling and well installations, UXO and OEW identifications and avoidance.*

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

01/96-04/96 *Senior UXO Supervisor/Project Manager/UXO Site Manager, EOD Technology, Inc., Picatinny Arsenal, Dover, NJ. ICF Kaiser. Supervised and managed soils sampling and monitoring well installation, UXO. OEW identification and avoidance.*

04/96-07/96 *Senior UXO Supervisor/Project Manager/UXO Site Manager, EOD Technology, Inc., 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 *Senior UXO Supervisor/Project Manager/UXO Site Manager, EOD Technology, Inc., Picatinny Arsenal, Dover, NJ. ICF Kaiser. Waterborne UXO identification and avoidance in the taking of lake bottom soil samples.*

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

11/96 *Senior UXO Supervisor/Project Manger/UXO Site Manager, EOD Technology, Inc., Fort Knox, Ky. SAIC. Surveying in girds and conducting an EM-31 survey to identify burial pits. Surface clearance of OEW/UXO.*

11/96 *Senior UXO Supervisor/Project Manager/UXO Site Manager, EOD Technology, Inc., Picatinny Arsenal, Dover, NJ. ICF Kaiser. UXO/OEW identification and avoidance in support of soil sampling and well installation.*

03/97 *Senior UXO Supervisor, EOD Technology, Inc., Fort Knox, KY. Conducting UXO Survey utilizing EM-31.*

04/97-05/97 *Senior UXO Supervisor, Middlesex, NJ.*

08/97	***Senior UXO Supervisor, Vance International V.I.P. Rockville, MD.***
10/97	***Senior UXO Supervisor, EOD Technology, Inc., Seneca, NY.***
11/97-12/97	***Senior UXO Supervisor, EOD Technology, Inc., Jefferson Barracks, St. Louis, MO.***
01/98-06/98	***Senior UXO Supervisor, EOD Technology, Inc., McGregor Range, Ft. Bliss, TX.***
06/98	***SUXOS, EOD Technology, Inc., Raritan, Edison, NJ***
09/98-10/98	***Senior UXO Supervisor; EOD Technology, Inc., Seneca Army Depot, Romulus, NY***
01/99	***SUXOS, EOD Technology, Inc., Seneca Army Depot, Romulus, NY***
01/99-Present	***SUXOS, EOD Technology, Inc., Woodbine, GA***

APPENDIX G

OF THE

WORK PLAN

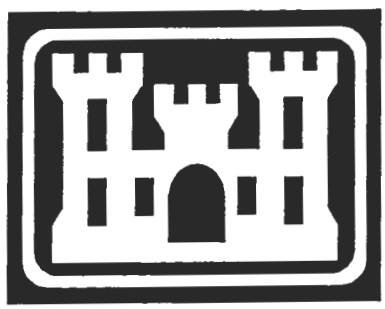
FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

STANDARD OPERATING PROCEDURES

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

Prepared For:



The U.S. Army Engineering and Support Center
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March 1999

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U.S. ARMY CORPS OF ENGINEERS, HUNTSVILLE DIVISION (CEHND)
SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR
UNEXPLODED EXPLOSIVE ORDNANCE (UXO)

1.0 INTRODUCTION

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

2.0 REFERENCES

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

- ATF 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 Genetic Scope of Work for Ordnance Avoidance Activities
- TM 9-1300200 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

3.0 DEFINITIONS

3.1 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 function and causing injury to personnel or damage to material.

3.2 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.

3.3 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 no closer than approximately 12 inches to a subsurface anomaly.

3.4 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 Eglin AFB, FL with more than three years combined active duty military EOD and contractor UXO experience shall also be UXO qualified.

4.0 GENERAL SAFETY CONCERNS

4.1 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.

4.2 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.

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

4.4 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 by taken if the ordnance is encountered in a suspected EMR (RF) field.

4.4.1 The presence of antennas, communication and radar devices should be noted on initial site visits and/or preliminary assessments.

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

4.5 Do not wear outer or undergarments 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 EED will ground himself/herself prior to touching the UXO. Refer to DA PAM 385-64 for more information regarding non-static producing attire.

5.0 UXO SAFETY PRECAUTIONS FOR SITE CHARACTERIZATION

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

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

5.3 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.

5.4 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 records search indicates the site was used as an impact area.

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

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

5.7 Do not rely on the color coding of UXO for positive identification of contents. Munitions having none, incomplete, or improper color coding have been encountered.

5.8 Avoid the area forward of the nose of a munition until it can be determined that the item is not a shaped charge and High Explosive Anti-tank (HEAT) UXO. The explosive jet can be fatal to great distances forward of the longitudinal axis of the item. Assume any shaped charge munition to contain a piezoelectric (PZ) fuzzing system until the fuzing is otherwise identified. A PZ fuze is extremely sensitive, can fire at the slightest physical change, and may remain hazardous for an indefinite period of time.

5.9 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.

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

5.10.1 Do not expose rocket motors to any EMR source.

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

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

5.11.1 Many training mines contain firing indicator charges capable of inflicting serious injury.

5.11.2 Exercise care with wooden mines that have been buried for a long time. Because of soil conditions, the wood deteriorates and the slightest inadvertent pressure on top may initiate the fuze.

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

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

5.14 If the positive identification of suspect 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..

6.0 ORDNANCE RELATED HTRW ACTIVITIES

6.1 Investigation activities on potential ordnance contaminated sites will be accomplished using approved ordnance avoidance procedures.

6.2 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.

7.0 RESTRICTED AREA/EXCLUSION OPERATIONS

7.1 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 established based on the following minimum factors:

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

7.1.2 Project type: surface clearance, subsurface clearance, sifting operation, sampling, etc..

7.1.3 Known ordnance contamination, distances to public exposure, terrain, etc.

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

7.3 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.

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

7.3.2 Provide a designated emergency vehicle in the area in case of an accident or other emergency.

7.3.3 Coordination with the appropriate airspace representative shall be conducted and the appropriate notification procedures arranged.

7.3.4 When non-essential personnel must enter the restricted/exclusion area, the following must be accomplished: 1) the individual must receive a safety briefing, 2) be escorted by a UXO qualified individual; and 3) All UXO operations must cease with the fragmentation radius of the largest item expected to be encountered within the area.

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

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

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

7.5.3 Do Not dismantle or strip any UXO>

7.5.4 Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on the UXO. Such action may arm, actuate, or function the UXO.

7.5.5 Do Not subject mechanical time fuzes to any unnecessary movement.

7.5.6 Do not remove any fuzes from UXO's.

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

7.6 Personnel working with explosives and explosive ordnance shall comply with the following.

7.6.1 Do not conduct operations without approved Standing Operating Procedures (SOP) and proper supervision.

7.6.2 Do not smoke, except in authorized areas.

7.6.3 Do not have fires for heating or cooking, except in authorized areas.

7.6.4 Do not conduct explosive operations during electrical, sand, dust or snow storms.

7.6.5 Explosive operations will be conducted during daylight only.

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

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

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

7.9 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 air shall also be immediately available.

8.0 STORAGE

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

1. On-DoD Installations.
2. Off-DoD Installations.

8.2 On-DoD Installation Storage

8.2.1 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.

8.2.2 If an installation does not have an existing storage facility, the provisions of below shall apply.

8.3 Off DoD Installation Storage.

8.3.1 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.

8.3.2 When establishing an explosive storage area, the following requirements must be met.

8.3.2.1 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.

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

8.3.2.3 Each magazine must have lightning protection IAW Chapter 7, DoD 6055.9-STD.

8.3.2.4 Magazines must meet intra magazine distances as defined in Chapter 9, DoD 6055.9-STD.

8.3.2.5 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.

8.4 A fire plan for the storage of explosives 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.

9.0 EXCAVATION OPERATIONS

9.1 The usual method for uncovering buried UXO is to excavate by hand. Hand excavation is the most reliable method for uncovering UXO, but unless the UXO is very near the surface, hand excavation exposes more people to the hazard of detonation for a longer period of time than any other method. Hand excavation will be accomplished only by UXO personnel.

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

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

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

9.2.3 Excavation and trenching shall comply with the provisions of 29 CFR 1926 Subpart P.

10.0 DISPOSAL OPERATIONS

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

10.1.1 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 a accident.

10.1.2 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.

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

10.1.4 Exercise extreme care in handling and preparing high explosives for detonation. They are sensitive to detonation by heat, shock, and friction.

10.1.5 Do not pack a bomb fuze well with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.

10.1.6 Photoflash bombs must be handled with the same care as black powder filled munitions..

10.1.7 WP UXO shall not be detonated into the ground. The UXO shall be counter-charged on the bottom-center-line.

10.2 The following Safety rules will be adhered to at all times:

10.2.1 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.

10.2.2 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.

10.2.3 Do not use explosives or accessory equipment that are obviously deteriorated or damaged. They may detonate prematurely or fail completely.

10.2.4 Always point the explosive end of blasting caps, detonators, and explosive devices away from the body during handling. This will minimize injury should the item explode.

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

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

10.2.7 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.

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

10.3 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.

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

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

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

10.5.2 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.

10.5.3 Items with lugs and/or strongbacks and nose and/or tail plate sections should be oriented away from personnel locations as these items tend to travel further than normal fragmentation.

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

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

10.7.1 Do not inhale eye 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.

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

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

10.8 Inert UXO will not be disposed of or sold for scrap until the internal fillers have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert fillet, moisture and air to expand and burst sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to confined pressure.

11.0 TRANSPORTATION

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

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

11.3 Do not transport a WP munition, unless it is immersed in water, mud or wet sand.

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

11.5 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.

11.6 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.

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

11.8 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 (PM) 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 operations where the potential exists for personnel exposure to biological hazards. 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 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.

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.

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 on site;
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 on site, 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.

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.

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.

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. 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, groin, arm pits 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 are difficult to see and can be situated in trees, rocks, bushes or in the ground;
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.

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 on site 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 on site. 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.

The black widow is a coal-black bulbous spider 3/4 to 1 ½ 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.

The brown recluse is brownish to tan in color, rather flat, ½ 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.

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

5.1.6 Scorpions

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.

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. If scorpions are suspected or known to be on site, 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), and 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 work practices listed below 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 skin protection factor (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

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. 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.

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 Safety Training Attendance Log for the initial site hazard training;
3. The Safety Training Attendance Log for the Daily Tailgate Safety Briefings; and
4. The Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments are associated with this SOP.

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

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.

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

5.2.3.4 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. Environmental conditions and monitoring data will be 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 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 are associated with this SOP.

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.

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 parts of OSHA Construction Industry Standard 29 CFR Part 1926, Subpart F;
- Applicable parts 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for operations where fire protection and prevention is needed. 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 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for all operations involving the use of products containing hazardous substances. 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 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

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. The SSHO will also be responsible for reviewing 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.

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. 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 the potential exists for exposure to hazardous chemicals;
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, PPE 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

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). 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.

5.7 INDUSTRIAL HYGIENE SURVEY

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. These efforts will be coordinated by the SSHO and the SUXOS, 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

ation: _____ Site Safety Officer: _____

_____

PRODUCT NAME	SUPPLIER'S NAME AND ADDRESS	HAZARDOUS CHEMICALS	MSDS AVAILABLE	CONTAINER SIZE/TYPE	L

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

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

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 6.J

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 involving potential personnel exposure to heat stress. 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 TEAM LEADER/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 (SSHO)

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 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

To allow site personnel to seek refugee from the radiant heat, EODT may 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.

Personnel inside the EZ who enter the sheltered EZ rest area and are wearing Modified Level D PPE, as defined in the 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.

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 111-1. 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 [e]

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.

[e] 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 environmental 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 Safety Meeting Attendance Log for the initial site hazard training;
4. The Safety Meeting Attendance Log 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

Site Name: _____ Conditions: _____

Location: _____ _____

	Organization	Start Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time	Pulse Rate	Time

Observations:

Figure 111-1

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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for all operations where personnel may be exposed to the hazards of stored or potential energy. 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) 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 (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); 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

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.

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. 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

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.

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

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.

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. 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

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.

6.3 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 accidentally 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

	NAME OF AUTHORIZED EMPLOYEE	DESCRIPTION/TYPE OF DEVICE ISSUED	ISSUED			RETUR	
			DATE	TIME	BY	DATE	TIM

Figure 113-1

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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for operations involving material handling. 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) 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 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 storage 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 access ways 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. Non-compatible 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for operations which involve personnel exposure to high noise sources. 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.

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 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

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

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 115-1 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 , advantages, disadvantages, and attenuation of various hearing protectors;
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 115-1. 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 Safety Meeting Attendance Log for the initial site hazard training;
3. The Safety Meeting Attendance Log for the Daily Tailgate Safety Briefings; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments are associated with this SOP.

STANDARD OPERATING PROCEDURE 117
SANITATION, HOUSEKEEPING 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;
- 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is properly implemented, and for assuring safe and sanitary conditions are maintained during site activities. The SUXOS 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 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.

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 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. 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 suppport zone (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 contamination reduction zone (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 ór 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, or if site operations must be conducted at night, illumination levels in Table 117-1 shall the minimum allowed during the conduct of site related activities.

Table 117-1, Minimum Illumination Levels

Foot-candles	Area of Operation
5	General site area, and inside facilities, such as warehouses, hallways, and exit ways.
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 Safety Meeting Attendance Log for the initial site hazard training;
3. The Safety Meeting Attendance Log for the Daily Tailgate Safety Briefing; and
4. The Daily Safety Inspection Checklist.

7.0 ATTACHMENTS

No attachments are 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for all operations where safety and health hazards require the posting of signs and labels. 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

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 IAW 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;
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 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for power and hand tool 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 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;
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 for operation;
8. Electrical tools shall be operated IAW the 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 prevent them from falling;
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 superseded by specific requirements stated in the Site Safety and Health Plan.

1. Hard hat and 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 protective, gloves shall be worn when using hand/power tools; and
5. Protective face shields shall be worn 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 are 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 Program;
- DA PAM 385-64, Ammunition and Explosives Safety Standards;
- TM 9-1300-206, 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;
- ATF 5400.7, Alcohol Tobacco and Firearms Explosives Laws and Regulations; and
- Applicable sections of DOT, 49 CFR Parts 100 to 199.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The EOD Technology, Inc. (EODT) Project Manager (PM) 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 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.
- 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.
- 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 conducted in accordance with 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-1-2 and 120D-1-3, shall be used for determining the safe distances from transmitter antennas.
- No Demolition operation will be 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 and procedures 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 in accordance with contracted procedures, as well as 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. If necessary, this will be coordinated with the contractor representative. 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 un-shunting 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 personneland 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 demolition material. Prior to handling any detonators that are connected to the firing line, personnel shall ensure that they are grounded. The detonators will then be carried to the demolition pit with the end of the detonators 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 and again one minute prior to the shot.

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 25 feet away from detonators and demolition materials until ready for use. To ensure consistent safe handling, each classification of demolition material shall be separated by at least 25 feet 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 large enough to accommodate the detonator, place the detonator in the loop and secure it with tape. The detonator's explosive end 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.
- 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, 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 demolition materials:

- 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 Department of Transportation.
- 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 and Explosive Carrier Vehicles	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.
- No demolition operations shall be conducted if the surface wind speed is greater 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 custodian of the 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.
- Check the firing circuit .
- 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 a post-shot waiting period of 5-minutes and the DS has 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 and blasting machine connections and make a second initiation attempt.
- 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 maximum delay predicted for any part of the shot has passed, the designated technician will proceed down range to inspect the firing system, and a safety observer must watch from a protected area.
- Disconnect and shunt the detonator wires, connect a new detonator to the firing circuit, check the replacement detonator for continuity, and prime the charge without disturbing the original 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 60 minute wait period plus the time of the safety fuse, i.e., 5 minute safety fuse plus 60 minutes for a total of 65 minutes.
- 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.

10.4 DETONATING CORD MISFIRE

EODT uses det cord to tie in multiple demolition shots and to ensure that electric detonators are not buried. Since det cord initiation will be either electrical or non-electrical, the procedures presented in paragraphs 10.1, 10.2, or 10.3, as appropriate to the type of detonator used, will be used to clear a det cord misfire. In addition, the following will be conducted:

- If there is no problem with the initiating system, wait the prescribed amount of time and inspect the initiator to the cord connection to ensure it is properly connected. If it was a bad connection simply attach a new initiator and follow the appropriate procedures in para 6.0.
- If the initiator detonated and the cord did not, inspect the cord to ensure it is det cord and not time fuze. Also, check to ensure there is PETN in the cord at the connection to the initiator.
- It may be necessary to uncover the det cord and replace it. This must be accomplished carefully to ensure that the demolition charge and the OE item are not disturbed.

10.5 PERFORATOR MISFIRE

The use of perforators is considerably safer than the use of C-4 and many other demolition materials. If the perforator is not initiated properly, it could malfunction. Since the perforator is covered with tamping material, det cord is used as the initiator. Therefore, in the event of a misfire, the procedures presented in para 10.4 will be followed, along with the items presented below.

- If everything went but the perforator, one of four things has occurred:
  1. Det cord grain size was insufficient to initiate the perforator;
  2. The det cord was dislodged from the perforator when placing tamping materials;
  3. The perforator was defective;
  4. The perforator was moved during the placement of tamping materials.
- Check to ensure the grain size of the det cord is sufficient, with 80 grain size or greater being the recommended size.
- If the det cord connection to the perforator was the problem, ensure that the next connection is secure (use duct tape if necessary).
- If it is evident that the perforator was moved, ensure it is properly secured for the next shot.
- If cord size and connection are sufficient, replace the perforator, leaving the defective one on the shot

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 PPE 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

EODT ATF LICENSE

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 RESPONDENCE TO: CHIEF, F & E LICENSING CENTER BATF, P.O. BOX 2994 ATLANTA, GA 30301-2994	LICENSE/PERMIT NUMBER: 1-TN-001-33-0H-97374 EXPIRATION DATE: AUGUST 1, 2000
NAME: LICENSED PREMISES: EOD TECHNOLOGY, INC	10938 HARDIN VELLEY RD KNOXVILLE, TN 37932
OF OR T: 33 - USER OF HIGH EXPLOSIVES	
EF, F & E ING CENTER: [signature]	

PURCHASING CERTIFICATION

rtify that this is a true copy of a license/permit ied to me to engage in the activity specified

(SIGNATURE OF LICENSEE/PERMITTEE)

LICENSEE OR PERMITTEE MAILING ADDRESS

EOD TECHNOLOGY, INC
PO BOX 24173
KNOXVILLE, TN
37933-2173

licensee/permittee named herein shall use a reproduction of this se/permit to assist a transferor of explosives to verify the identity status of the licensee/permittee as provided in 27 CFR Part 55. signature on each reproduction must be an ORIGINAL signature.

F 5400.14/5400.15, Part 1 (8/89)

Figure 12OD-1

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 mobile RF, television and FM broadcasting transmitters. Tables 120D-1-1 and 120D-1-2 are to be used for determining the minimum safe distances to be maintained from different types of radio and television transmitters when electric detonators are in use.

TABLE 120D-1-1:
MINIMUM SAFE DISTANCE FROM TRANSMITTER ANTENNAS

Average or Peak Transmitter Power in Watts	Minimum Distance to Transmitter in Meters / Feet
0 - 5	7.5 / 25
6 - 30	30 / 98.4
31 - 50	50 / 164.1
51 - 100	110 / 360
101 - 250	160 / 525
251 - 500	230 / 755
501 - 1,000	305 / 1,000
1,001 - 3,000	480 / 1,575
3,001 - 5,000	610 / 2,001
5,001 - 20,000	915 / 3,002
20,001 - 50,000	1,530 / 5,020
50,001 - 100,000	3,050 / 10,007
100,001 - 400,000	6,100 / 20,014
400,001 - 1,600,000	12,200 / 40,028
1,600,001 - 6,400,000	24,400 / 80,056
Note: When the transmission is a pulsed or pulsed continuous wave type and its pulse width is less than 10 microseconds, the power column indicates average power. For all other transmissions, including those with pulse widths greater than 10 microseconds, the power column indicates peak power.	

Source: Table 6-3

TABLE 120D-1-2:
MINIMUM SAFE SEPARATION FORMULAS

Unknown (Worst Case)	Without Metal Pack		With Metal Pack	
Use Table 120D-1-1	Frequency	Formula	Frequency	Formula
	≤2.3 KHz	$D = 0.093 \times (PG)^{0.5}$	≤73 KHz	$D = 0.093 \times (PG)^{0.5}$
	2.3 KHz - 0.45 MHz	$D = 39.7 \times F \times (PG)^{0.5}$	73 KHz - 0.45 MHz	$D = 126 \times F \times (PG)^{0.5}$
	0.45 MHz - 400 MHz	$D = 18 \times (PG)^{0.5}$	0.45 MHz - 400 MHz	$D = 0.6 \times (PG)^{0.5}$
	400 MHz - 75 GHz	$D = (7137 / F) \times (PG)^{0.5}$	400 MHz - 2.4 GHz	$D = (226 / F) \times (PG)^{0.5}$
	>75 GHz	$D = 0.093 \times (PG)^{0.5}$	>2.4 GHz	$D = 0.093 \times (PG)^{0.5}$

Where :

D = Safe distance to the transmitter in feet (multiply feet by 0.305 to obtain meters)

P = Output power of the transmitter in watts

G = Numerical gain of transmitter antenna

F = Frequency in MHz (divide KHz by 1,000 to obtain MHz, and multiply GHz by 1,000 to obtain MHz)

To properly use this table, the following assumptions are made:

1. The no-fire current of the EED is 10 mA.
2. At least 10 dB below the no-fire current in EED is considered to be safe.
3. The metal pack provides at least 30 dB of shielding.
4. Non-metal packs provide no shielding.
5. A 1 volt / meter field intensity is considered to be safe.
6. At no time should personnel or munitions be exposed to more than 200 volts / meter

Source: Table 6-4

STANDARD OPERATING PROCEDURE 120-E
UXO/OE OPERATIONS - EXPLOSIVES ACQUISITION, STORAGE, AND ACCOUNTABILITY

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, and accountability 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 Code of Federal Register (CFR) 1910, Industry Standards;
- OSHA, 29 CFR 1926, Construction Standards;
- ATF P 5400.7, ATF-Explosives Law and Regulations;
- USACE 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 in accordance with EOD Technology, Inc. (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 will have a valid Bureau of Alcohol Tobacco and Firearms (BATF) license/permit (see Figure 120E-1) on hand, to include an Explosives Purchase/Receipt Authorization List (See Figure 120E-2) for the receipt of explosives. These two documents must be on file at the EODT office, and each explosives supplier must also have a copy of each in order to sell to EODT. A copy of the BATF license and the authorization list for the project site will be maintained at the site.

6.2 STATE BLASTERS LICENSE

In this project, it will be necessary for EODT personnel to obtain a state blaster's license, as required by California-OSHA. 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 open burn/open detonation. 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 3/8-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

The BATF and the Department of Defense (DoD) require that all magazines be appropriately posted for content hazard class, fire fighting hazard and an emergency notification list. Magazines will be placarded in accordance with 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.

8.1.5 Lightning Protection

Appropriate lightning protection will be installed in accordance with DoD 6055.9, Chapter 7, NFPA 78 and AR 385-64. Utilizing the Lightning Protection System software provided by the U.S. Army

Corps of Engineers Engineering and Support Center, Huntsville (CEHNC), the height of the lightning mast will be determined which will provide full lightning protection for the magazine. The mast will be secured with guide wires and attached to a grounding system, which will in turn be secured to the magazine.

8.1.6 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.

8.1.7 Compatibility

Explosive compatibility will be maintained in accordance with 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 if at all possible.

8.1.8 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 the Quality Control Specialist.

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, the CEHNC Contracting Officer (or the Contracting Officer Representative) and the BATF will be notified. All actions from this point will be dictated by the BATF.

10.0 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.

11.0 ATTACHMENTS

EODT Form 120E/F-1 ..... Emergency Response Information Form

EODT Form 120E/F-2 ..... Authorization List

Figure 120E-3 ..... BATF License/Permit

Figure 120E-4 ..... Bill of Lading

Figure 120E-5 ..... Example Freight Company Shipping Document

Figure 120E-6 ..... Explosives Accountability Record / Magazine Data Card

TABLE 120E-1

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION	
GROUP A	
Cyclonite (RDX), dry	Mercury fulminate, wet
HMX, dry	PETN, dry
Lead azide, wet	RDX (cyclonite), dry
Lead styphnate, wet	Tetracene, wet
GROUP B	
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).	Detonators
	Mines, practice, AP, M17
	Percussion elements
	Primer detonators
GROUP C	
Ammunition, blank and saluting, cannon	Cartridge, 90mm, canister, AP
Ammunition, .50 caliber, except API/incendiary	Cartridges, practice, over 40mm
Ammunition, 20mm, practice and high pressure test	Catapults, aircraft ejection seat, M3A1, M4A1, M5
Ammunition, 25mm, with inert projectile	Charge, propelling, not assembled to projectiles EC powder
Ammunition, 27mm, caseless	Detonating cord (primacord)
Ammunition, 30mm, ball and high pressure test	Nitrocellulose
Ammunition, 30mm, practice and training	Fuel (solid), emergency power unit
Ammunition, 37mm and 40mm, TP and AP	Propellant
Ammunition, 40mm, practice, M407A1, M382, and M385	Rockets, practice, 3.5-inch
Benite	Rocket motors, M3, M5, M6, M10, M13, M26, M30, M37, M42, M53, M66; Pershing 1st and 2nd stages; Spartan 1st, 2nd, and 3rd stages
Baron potassium nitrate	
GROUP D	
Adapter booster	Explosive D
Ammonium nitrate, except in original shipping container or equivalent	Explosives, cratering

TABLE 120E-1 (continued)

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION	
Ammonium perchlorate, except when particle size is over 15 microns and in original shipping container or equivalent	Grenades, rifle, AT (except pentolite loaded)
Ammonium picrate (Explosive D)	HMX, wet
Bangalore torpedoes	Mine, APERS, MN, M14 (w/integral fuse)
Baratol	Mines, antipersonnel (bounding type
Black powder, bulk	Mines, antipersonnel (cast iron block)
Bombs, demolition	Mines, HEAT Nitrocellulose wet 8-30% water exposed to detonation hazards at less than intra line distance
Bombs, fragmentation	Nitroguanidine
Bombs, general purpose	Nitrostarch Octol
Boosters	PBX
Boosters, auxiliary	pentolite
Bursters	PETN, wet
Charge, demolition, snake	Picratol
Charge, springing earth rod, blast driven	Picric acid
Charge, supplementary, HE	Projectiles, HE, fuzed or unfused
Compositions A, A-2, A-3, A-4, B, B-3, C, C-2, C-3, and C-4	RDX (Cyclonite), wet
Cutter, cable M1	Rocket heads, HE and HEAT (except pentolite loaded) w/o motors
Cyclonite (RDX), wet	Shaped charges
Cyclotol	Tetranitrocarbazole (TNC)
Demolition Blocks	Tetryl
Destructor, HE, M10	Tetrytol
Detonating cord (primacord) exposed to detonation hazard at less than intra line distance	TNT
Dynamite	Tritonal
Ednatol	Torpex

TABLE 120E-1 (continued)

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION	
GROUP E	
Ammunition, HEP	Ammunition, fixed and semifixed, 90mm through 106mm, loaded with ammonal, amatol, Explosive D, composition B or TNT
Ammunition, 20mm, HE, HEI and functional packs containing HE and HEI	Cartridge, heavy mortar, over 81mm (including 81mm M56), except chemical loaded
Ammunition, 30mm, HEDP	Cartridge, light mortar, 81mm or less (excluding 81mm M56), except chemical loaded
Ammunition, 37mm, HE	Redeye guided missiles, packaged 3 complete rounds w/launcher
Ammunition, 40mm, HE, RDX loaded	
Ammunition, 40mm, HE, M406, M386, M441, and M463	Rockets, HEAT, 3.5-inch, complete round
Ammunition, 57mm through 81mm, except WP smoke, HEP and blank	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	Grenades, hand, CN1, ABC, M25A1, w/fuse C12
Ammunition, 20mm, API	Grenades, hand, CM1, ABC, M25A2, w/fuse C12
Ammunition, 20mm, incendiary and functional packs containing incendiary, except those containing HE or HEI	Grenades, illuminating and incendiary
Ammunition, 40mm, riot control and pyrotechnic loaded, except WP smoke	Grenades, practice, w/spotting charge
Bombs, photoflash	Grenades, rifle, smoke, XM48E1 and M22 and M23
Cartridge, igniter, M2	Grenades, smoke (except WP and PWP)
Cartridge, illuminating	Grenades, riot control, CS1, M25A2
Cartridge, photoflash	Igniter, spotting charge
Cartridge cases, primer (w/o propellant)	Igniters for rocket motors (e.g., M12, M18, M20 and M29)
Charge, igniter assembly, for practice hand grenades	Ignition cartridge for trench mortar ammunition

TABLE 120E-1 (continued)

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION	
Charge, spotting, APR practice, M8	Illuminating compositions (consolidated in final press operations)
Chemical ammunition, Group B, tear or smoke producing, w/explosive components, over 40mm	Mines, practice, w/spotting charge and/or fuse
Chemical ammunition, Group B, tear or smoke producing, w/o explosive components	Nuclear fire marker device 11-F2
Chemical ammunition, Group D, containing flammable solids, except for TEA or TPA, w/o explosive components	Photoflash powder
Chemical ammunition, Group D, fixed or semi-fixed rounds, containing flammable solids, except for TEA or TPA	Primers, artillery and cannon, percussion and electric
Clusters, incendiary bomb, M31 and M32 (w/o fuzing components)	Projectiles, illuminating
Destroyer, file, M4	Rocket, riot control agent, CS, 2.75-inch FFAR, MX99
Detonation, simulator, explosive M80	Simulators, M110, M115, M116, M117, M118, M119 and XM142
Grenade, hand, smoke, HC, M8	Smoke pots
Grenades, hand, CN, M7A1, w/fuse M201A1	Spotting charges (cartridge for miniature practice bombs)
Grenades, hand, CS, M7A3, w/fuse M210A1	
GROUP H	
Chemical ammunition, Group C	Grenade rifle, WP, M19
Grenades, WP	
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	

TABLE 120E-1 (continued)

STORAGE COMPATIBILITY GROUPS FOR EXPLOSIVES AND AMMUNITION	
GROUP L	
Aluminum powder	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
Ammonium nitrate	Magnesium powder
Ammonium perchlorate	Grenades, rifle, AT (pentolite loaded)
Ammunition, pentolite loaded	Nitrates (inorganic), except ammonium nitrate (in original shipping container or equivalent)
Chemical Ammunition, Group A, without explosive components	Perchlorates
Chemical ammunition, Group B, without explosive components, designed for toxic or incapacitating effects more severe than lachrymation	Peroxides, solid
Chemical ammunition, Group D, TEA or TPA components	Rocket heads, pentolite loaded, w/o motors
Chlorates	Zirconium (types I and II, spec. FED 1665)
DNT	
GROUP S	
Ammunition, 40mm, canister and multiple projectile	Fuse lighters
Ammunition, small arms, less than .50 caliber	Fuse safety
Explosive bellows	Squibs commercial
Firing devices	

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

Notes:

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.

SHIPPING PAPER AND EMERGENCY RESPONSE INFORMATION FOR HAZARDOUS MATERIALS

THIS VEHICLE IS TRANSPORTING HAZARDOUS MATERIALS

Date Prepared:	Date of Travel:	Page_____of_____

Proper Shipping Name	Hazard	ID No.	PG	Qty/Units	Weight

Emergency notification. In all cases of accident, incident, breakdown or fire, prompt notification must be given.

FOR EMERGENCY RESPONSE INFORMATION, SEE BACK OF THIS FORM

Remarks:

Certification:

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.

Signature of Shipper Representative:	Signature of Vehicle Operator(s):

24-Hour Emergency Assistance Telephone Numbers:	Work Hours Emergency Phone Numbers:

EMERGENCY RESPONSE INFORMATION

Guide Number 46 and 50 from the U.S. Department of Transportation Emergency Response Guide Book P 5800.6 are reproduced hereon. These guides are applicable to Hazard Class 1 Materials (Explosives).
Mark an X in the appropriate box:

☐ USE GUIDE 46 FOR EXPLOSIVES

☐ USE GUIDE 50 FOR EXPLOSIVES

For all other hazardous materials or substances, annotate appropriate Emergency Response Guide Book Guide Number in the block below, and attach a copy of the guide number page or pages.

Guide Numbers:

GUIDE 46 (ERG 93)

POTENTIAL HAZARDS

FIRE OR EXPLOSION:

May explode and throw fragments 1 mile or more if fire reaches cargo.

HEALTH HAZARDS:

Fire May produce irritating or poisonous gases.

EMERGENCY ACTION

If fire reaches cargo, do not fight fire.

If you know or suspect that heavily-encased explosives, such as bombs or artillery projectiles are involved, stop all traffic and begin to evacuate all persons, including emergency responders, from the area in all directions for 5000 feet (1 mile) for rail car or 4000 feet (3/4 mile) for tractor/trailer.

When heavily-encased explosives are not involved, evacuate the area for 2500 feet (½ mile) in all directions.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.

CALL Emergency Response Telephone Number on Shipping paper FIRST. If Shipping Paper NOT AVAILABLE or NO ANSWER, CALL CHEMTREC AT 1-800-424-9300.

FIRE

Cargo Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO. Withdraw from area and let fire burn.

Truck and Equipment Fires: Try to prevent fire from reaching the explosive cargo compartment. Flood with water; if no water is available use Halon, dry chemical or earth.

Promptly isolate the scene by removing ALL PERSONS from the vicinity of the incident if there is a fire. First, move people out of line-of-sight of the scene and away from windows. Then, obtain more information and specific guidance from competent authorities listed on the shipping papers.

SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area. Do not touch or walk through spilled material.

FIRST AID

Call emergency medical care.
Use first aid treatment according to the nature of the injury.

GUIDE 50 (ERG 93)

POTENTIAL HAZARDS

FIRE OR EXPLOSION:

May explode and throw fragments 1/3 mile or more if fire reaches cargo.

HEALTH HAZARDS:

Fire May produce irritating or poisonous gases.

EMERGENCY ACTION

If fire reaches cargo, do not fight fire.

Stop all traffic and begin to evacuate all persons, including emergency responders, from the area for 1500 feet (1/3 mile) in all directions.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.

CALL Emergency Response Telephone Number on Shipping paper FIRST. If Shipping Paper NOT AVAILABLE or NO ANSWER, CALL CHEMTREC AT 1-800-424-9300.

FIRE

Cargo Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO. Withdraw from area and let fire burn.

Truck and Equipment Fires: Try to prevent fire from reaching the explosive cargo compartment. Flood with water; if no water is available use Halon, dry chemical or earth.

Promptly isolate the scene by removing ALL PERSONS from the vicinity of the incident if there is a fire. First, move people out of line-of-sight of the scene and away from windows. Then, obtain more information and specific guidance from competent authorities listed on the shipping papers.

SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area. Do not touch or walk through spilled material.

FIRST AID

Call emergency medical care.
Use first aid treatment according to the nature of the injury.

SUPPLEMENTAL INFORMATION

Packages bearing the 1.4S label contain explosive substances or articles that are designed or packaged in such a manner that when involved in a fire, may burn vigorously with localized detonations and projection of fragments; effects are usually confined to immediate vicinity of packages.

If fire threatens cargo area containing packages bearing the 1.4S label, consider initial isolation of at least 50 feet in all directions. Fight fire with normal precaution from a reasonable distance.

EODT EXPLOSIVES PURCHASE/RECEIPT/TRANSPORTATION AUTHORIZATION LIST

dress and County: (Home Office)

ddress and County: (Field Office)

deral 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

he 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: 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 RESPONDENCE TO	CHIEF, F & E LICENSING CENTER BATF, P.O. BOX 2994 ATLANTA, GA 30301-2994	LICENSE/ PERMIT NUMBER	1-TN-001-33-0H-97374
		EXPIRATION DATE	AUGUST 1, 2000
NAME	LICENSED PREMISES: EOD TECHNOLOGY, INC		10938 HARDIN VELLEY RD KNOXVILLE, TN 37932
OF E OR IT	33 - USER OF HIGH EXPLOSIVES		
HIEF, F & E SING CENTER	[signature]		

PURCHASING CERTIFICATION

ertify that this is a true copy of a license/permit used to me to engage in the activity specified

(SIGNATURE OF LICENSEE/PERMITTEE)

LICENSEE OR PERMITTEE MAILING ADDRESS

EOD TECHNOLOGY, INC
PO BOX 24173
KNOXVILLE, TN
37933-2173

e licensee/permittee named herein shall use a reproduction of this nse/permit to assist a transferor of explosives to verify the identity l status of the licensee/permittee as provided in 27 CFR Part 55. signature on each reproduction must be an ORIGINAL signature.

F 5400.14/5400.15, Part 1 (8/89)

DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
FIREARMS AND EXPLOSIVES LICENSING CENTER
ATLANTA, GEORGIA 30301-2994

August 12, 1997

E:RE:FL:wg
5340

EOD Technology, Inc.
10938 Hardin Valley Rd.
Knoxville TN 37932

1 TN 001 33 7H 97374

Dear Explosives Licensee/Permittee:

We have received your application for renewal of your explosives license/permit, but we will not be able to renew the license/permit at this time. As provided by 5 U.S.C. 558(C), you are authorized to continue operations under your current User of High Explosives license, 1 TN 001 33 7H 97374, until final action is taken on your application for renewal.

A copy of this letter may be supplied to other licensees/permittees for the next 6 months as evidence of your licensed status.

Your file will be reviewed before 6 months have passed and you will be sent another letter if your renewal application is still pending and you are still entitled to continue operations under your current license.

If you have any questions regarding this letter please contact the Firearms and Explosives Licensing Center at (404) 679-5040.

Sincerely yours,

Myrna H. Huntley

Myrna H. Huntley, Chief
Firearms & Explosives Licensing Center

FIGURE 120E-4: BILL OF LADING

IN CASE OF EMERGENCY INVOLVING THIS SHIPMENT, CONTACT CHEMTREC AT 1-800-424-9300 FOR ASSISTANCE.

UNIFORM BILL OF LADING
- NOT NEGOTIABLE -

SHIPPER № 920886

In case of emergency call:
Telephone 316-597-2552

Shipping Location XG-Hallowell, Ks.

SLURRY EXPLOSIVE CORPORATION
P.O. BOX 348
COLUMBUS, KANSAS 66725
Telephone (316) 597-2552

ATF No.: [illegible]

Date 11-26-91

SOLD TO		SHIP TO	
NAME	[illegible]	NAME	[illegible]
ADDRESS	111 Robertsville Road	ADDRESS	Attn: Lapyan Chan
			165 Fieldcrest Avenue
CITY	Oak Ridge	COUNTY	
STATE	Tennessee 37831	CITY & STATE	[illegible]

CUSTOMER PHONE:	CUST. P.O. NO.	DATE SHIPPED	Received By:
201-225-2000		[illegible]	

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	UN or NA
			High Explosive - Class A Explosive	✓
			Ammonium Nitrate - Fuel / Oil Mixture - Blasting Agent	✓
			Ammonium Nitrate (no organic coating) - Oxidizer	UN1942
			Ammonium Nitrate Mixed Fertilizer - Oxidizer	UN2069
			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	NA9193
			Oxidizer, n.o.s. - Oxidizer	UN1479
[illegible]	[illegible]	[illegible]	Nitromethane - Ltd Qty - Flammable Liquid	UN1261
[illegible]	[illegible]	[illegible]	Ammonium Nitrate (No Organic Coating Ltd. 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
920						
125/5 cs	112490	0074200	T-100 Yellow Solid			
375/15 cs	111790	0074200	" "			
220/20 cs	110191	0074100	T-100 Yellow Liquid Liter			
		X	Mfr 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-5: EXAMPLE FREIGHT COMPANY SHIPPING DOCUMENT

ABF FREIGHT SYSTEM, INC.
(ABFS) CONSIGNEE COPY
TERMINAL 908-862-4463
DUNS 00-690-2977

PERS NO. N/S
PICK UP DATE: /27/91
CODE TO: 352D
P.O. NO.: N/S
NO. OF PO'S -
ROUTING: JLN-LIN
FREIGHT BILL NO. 02307680

SHIPPER: 140030 023A
URRY EXPLOSIVE CORP
ORTSMAN PIT RD
LLOWELL KS 66725

CONSIGNEE: 000000-0000
IT CORP/EQUT
ATTN LAPYAN CHAN
165 FIELDCREST AVE
EDISON NJ 08837

PIECES	HM	DESCRIPTION	WEIGHT (LBS.)	RATE	CHARGES
		HAZ MAT EMERGENCY PHONE 800-424-7300	EMER:		
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	

SHP 140030 0000
URRY EXPLOSIVE CORP
X 348
LUMBUS KS 66725

COD AMOUNT
HH 0000 00
TAI ABF504
OZIP 66725
DZIP 08837
SPEC. HAND.
PAY THIS AMOUNT

REC
PAY
REMIT TO

FRI 12/06
PRIOR PRO DATE

DATE | DRIVER | CONSIGNEE 5 | BY (CUSTOMER'S SIGNATURE) X [signature] 12/9/91

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	Initials	

FIGURE 120E-6: EXPLOSIVES ACCOUNTABILITY RECORD/MAGAZINE DATA CARD

STANDARD OPERATING PROCEDURE 120-F
UXO/OE OPERATIONS - EXPLOSIVES AND OE TRANSPORTATION

1.0 PURPOSE

The purpose of this Standard Operating procedure (SOP) is to provide the procedures applicable to the transport of explosives to include demolition material and unexploded ordnance (UXO).

2.0 SCOPE

This SOP applies to all site personnel involved in the transport of explosives. This SOP is generic in nature and is not intended to cover all requirements necessary to ensure compliance at each site. It may be necessary to obtain state or local permits/licenses and even a Commercial Drivers License (CDL) in some instances. In most cases, the forms in Attachment 2 and the data contained int his SOP will be sufficient.

3.0 REGULATORY REFERENCES

Procedures and information contained in this document were obtained from the below listed references:

- U.S. Army Corps of Engineers (USACE) Engineering and Support Center, Huntsville (CEHNC) Safety Concepts and Basic Considerations for UXO;
- EOD Technology, Inc. (EODT) Corporate Safety and Health Program (CSHP);
- Applicable sections of Department of Transportation, 49 CFR Parts 172, 173, and 383, Transportation;
- Bureau Alcohol, Tobacco and Firearms (BATF) P 5400.7, Explosives Law and Regulations;
- USACE EM 385-1-1, Safety and Health Requirements Manual;
- Department of Defense (DoD) 4145.26-M, Contractors' Safety Manual for Ammunition and Explosives;
- DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards;
- Department of the Army (DA) Pamphlet (PAM) 385-64, Ammunition and Explosives Safety Standards;
- Army Regulation (AR) 385-64, Ammunition and Explosives Safety Standards;
- AR 385-40 w/USACE Supplement, Accident Reporting and Records;
- Technical Manual (TM) 9-1300-200, Ammunition General;
- TM 9-1300-206, Military Explosives.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) is responsible for determining the specific site requirements for licensing, permitting, and placarding. He will then advise the Senior UXO Supervisor (SUXOS) who will prepare an addendum to this SOP covering the site specific requirements, if different from the SOP. The addendum will be reviewed and approved by the Director of Operations (DOPS).

4.2 SENIOR UXO SUPERVISOR

As stated above the SUXOS will prepare and submit for approval the site specific addendum to this SOP, if applicable. In addition, it is the SUXOS responsibility to ensure this SOP is enforced and that the pertinent forms in Attachment 2 are property completed and in the vehicle(s).

4.3 EXPLOSIVE VEHICLE DRIVER

Individuals assigned to the transport of explosives will meet the site driver requirements, be thoroughly familiar with this SOP and the emergency procedures in the event of an accident/incident.

5.0 EXPLOSIVES AND OE TRANSPORTATION REQUIREMENTS

5.1 GENERAL REQUIREMENTS

Transportation of OE and explosives will comply with all Federal, state, and local regulations. Permits for the transportation of explosives or OE are not required for on-site or inter-facility transportation within Federal installations. 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 Code of Federal Register (CFR) part 172 and 173;
- Drivers will be provided EODT form 120-F-1(Special Instructions for Motor Vehicle Drivers);
- Vehicles will be inspected using EODT form 120-F-2, Motor Vehicle Inspection, and if applicable, 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.

5.2 TRANSPORTATION ON-SITE AND ON FEDERAL INSTALLATIONS

Transportation of explosives and OE on-site and on Federal installations will comply with the following:

- Vehicles will be inspected prior to use each day using the EODT Weekly Vehicle Inspection Checklists and will be properly placarded;
- Vehicle engine will not be running, and wheel chokes and brakes will be set when loading/unloading explosives;

- 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);
- The area of the vehicle where the explosives are placed for transportation will have either a plastic bed liner, dunnage, or sand bags placed in the area to protect the explosives from contact with the metal bed and fittings;
- Vehicles transporting explosives will have a first aid kit, two 10 pound ABC 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.

5.3 GENERAL PLACARDING REQUIREMENTS

According to 49 CFR 172.504, the placarding requirements listed below will apply to EODT explosives transportation:

> "(a)Except as otherwise provided, each bulk packaging, freight container, unit load device, transport vehicle or rail car containing any quantity of a hazardous material must be placarded on each side and each end with the type of placards specified in Tables 1 and 2, in accordance with other requirements and exceptions." (Tables 1 and 2 are presented on the following page.)
>
> "(c) Exceptions for less than 454 kg (1,001 pounds). Except for bulk packaging and hazardous materials subject to §172.505, when hazardous materials covered by Table 2 of this section are transported by highway or rail, placards are not required on–
>
> (1) A transport vehicle or freight container which contains less than 454 kg (1,001 lbs.) aggregate gross weight of hazardous materials covered by Table 2 of paragraph (e) of this section; or
>
> (2) A rail car loaded with transport vehicles or freight containers, none of which is required to be placarded."

The exceptions provided in paragraph (c) provided above, do not prohibit the display of placards in the manner prescribed in this subpart, if not otherwise prohibited (see § 172.502), on transport vehicles for freight containers which are not required to be placarded.

TABLE 1

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard Design Section Ref.(§)
1.1	Explosives 1.1	172.523
1.2	Explosives 1.2	172.524
1.3	Explosives 1.3	172.525
2.3	Poison Gas	172.532
4.3	Dangerous When Wet	172.528
6.1 (PG I, inhalation hazard only)	Poison	172.542
7 (Radioactive Yellow III label only)	Radioactive	172.544

TABLE 2

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard Design Section Ref.(§)
1.4	Explosives 1.4	172.523
1.5	Explosives 1.5	172.524
1.6	Explosives 1.6	172.525
2.1	Flammable Gas	172.532
2.2	Non-Flammable Gas	172.528
3	Flammable	172.542
Combustible liquid	Combustible	172.544
4.1	Flammable Solid	172.546
4.2	Spontaneously Combustible	172.547
5.1	Oxidizer	172.550
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled).	Organic peroxide	172.552
6.1 (PG I or II, other than Zone A or B inhalation hazard).	Poison	172.554
6.1 (PG III)	Keep Away from Food	172.553
6.2	(None)	
8	Corrosive	172.558
9	Class 9	172.560
ORM-D	(None)	

5.4 OFF-SITE TRANSPORTATION OF EXPLOSIVES OVER PUBLIC HIGHWAY

5.4.1 DOT Certificate of Registration

As long as only 1.4 explosives or less than 55 net explosive weight (NEW) of 1.1, 1.2, or 1.3 explosives are transported by EODT personnel, DOT certificates of registration for EODT persons involved in the transportation of demolition materials are not required.

5.4.2 Definition of Commercial Motor Vehicles

The term "commercial motor vehicle" (CMV) means a motor vehicle, or combination thereof, used in commerce to transport passengers or property if the motor vehicle meets any of the following:

- Has a gross combination weight rating of 11,794 or more kilograms (kg) (26,001 pounds or more) inclusive with a towed unit with a gross vehicle weight rating of more than 4,536 kilograms (10,000 pounds); or
- Has a gross vehicle weight rating of 11,794 or more KG (26,001 pounds or more); or
- Is designed to transport 16 or more passengers, including the driver; or
- Is of any size and is used in the transportation of materials found to be hazardous for the purposes of the Hazardous Materials Transportation Act and which require the motor vehicle to be placarded under the Hazardous Materials Regulations (49 CFR part 172, subpart E).

5.4.3 CDL Requirements

As long as EODT personnel are not using vehicles that weigh more than 26,000 pounds and are not transporting any materials that must be placarded under the DOT Hazardous Materials Regulations (i.e., they are only transporting 1.4 explosives) then the vehicle being used need not be classified as a CMV and the operator of the vehicle need not have a Commercial Driver's License (CDL). This is the typical situation for EODT personnel since EODT usually transports relatively small quantities of 1.4 demolition materials. However, if a CDL is required, the SUXOS will ensure that the requisite license/permits are obtained.

5.4.4 Mixed Packaging Requirements

Explosives of compatibility Group S may be packed with explosives of all other explosive compatibility groups except A and L. To determine the compatibility of the materials typically transported by EODT, check the Material Data Sheets presented in Attachment 1 to this SOP.

6.0 DOCUMENTATION

6.1 EODT FORMS

Any time explosives are being transported this entire SOP to include the completed copies of supporting forms presented in Attachment 2 of this SOP, will be in the vehicle. A brief description of the relevant forms is included below and shall be used to ensure proper completion of the forms.

1. EODT FORM 120E/F-1

Only those items which are being transported will be entered in the form with the applicable qty/units and weight columns completed. It is imperative that the NEW limitations of 55 lbs. not be exceeded. All required data will be entered on the front and the Guide 50 block should be checked on the back of the form.

2. EODT FORM 120E/F-2

The form will be completed ensuring the pertinent data for all those transporting explosives is included on the form. As with the other required forms, this one will also be part of the transport paperwork. Only the route shown will be used unless there is an emergency or the route is blocked. Any deviation from the planned route will be reported to and coordinated with the SUXOS.

3. EODT FORM 120F-3

The form is to be completed prior to placing any explosives in the vehicle and will accompany the shipment.

6.2 BATF PERMIT/LICENSE

A copy of the current BATF license will accompany the vehicle at all times and will be readily available for inspection. A copy of the BATF license will also remain at the project site whenever explosives transportation is being conducted as a requirement of the clients Statement of Work.

ATTACHMENT 1

MATERIAL DATA SHEETS

CORD, DETONATING - 1.4D - UN0289

NET EXPLOSIVE WEIGHT (NET):

0.00229 OZ = 1 Grain

80 gr. X .00229 = .1832 oz.

0.1832 oz. Per ft. x 100' = 18.32 oz. Total Net Explosive Weight per 100 feet

HAZARDOUS CLASS OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name:

CORD DETONATING, FLEXIBLE UN0289 1.4D

49 CFR 172.101 - TABLE OF HAZMAT MATERIAL

CORD DETONATING, FLEXIBLE UN0289 1.4D

49 CFR 173.63 (a)

Packaging Exceptions

(a) Cord, Detonating (UN0065), having an explosive content not exceeding 6.5g (0.23 ounces) per 30 centimeter length (one linear foot) may be offered for transportation domestically and transported as Cord, detonating (UN0289), Division 1.4 Compatibility Group D (1.4D) explosives, if the gross weight of all packages containing Cord, detonating (UN0065), does not exceed 45 kg (99 pounds) per:

(1) Transport vehicle, freight container, or cargo-only aircraft;

UN0065 and UN0289 Use Packaging Instruction #139

Packing Instruction	Inner Packagings	Intermediate Packagings	Outer Packagings
139 ..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0065, 0102, 0104, 0289 and 0290, the ends of the detonating cord must be sealed, for example, by a plug firmly fixed so that the explosive cannot escape. The ends of CORD DETONATING flexible must be fastened securely. 2. For UN 0065 and UN 0289, inner Packagings are not required when they are fastened securely in coils.	Bags ..... Plastics Receptacles ..... Fiberboard Metal Plastics Wood Reels ..... Sheets ..... Paper Plastics	Not necessary ..... —	Boxes. Steel (4A). Aluminum (4B). Wood, natural, ordinary (4C1). Wood, natural, sift proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fibreboard (4G). Plastics, solid (4H2). Drums. Steel, removable head (1A2). Aluminum, removable head (1B2). Plywood (1D). Fibre (1G). Plastics, removable head (1H2).

SHAPE CHARGE (1.4S) (UN0441)

HAZARDOUS CLASS OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name:

CHARGES, SHAPED, COMMERCIAL W/O DETONATOR UN0441 1.4S

49 CFR 172.101 TABLE OF HAZMAT MATERIAL

CHARGERS, SHAPED, COMMERCIAL WITHOUT DETONATOR UN0441 1.4S

49 CFR 173.62

Packaging & Instructions #137

49 CFR ch. 1 (10-97 Edition) § 173.62

Packing Instruction	Inner Packagings	Intermediate Packagings	Outer Packagings
137 ..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: For UN 0059, 0439, 0440, and 0441, when the shaped charges are packed singly, the conical cavity must face downwards and the package marked "This Side Up". When the shaped charges are packed in pairs, the conical cavities must face inwards to minimize the jetting effect in the event of accidental initiation. 2. For UN 0065 and UN 0289, inner Packagings are not required when they are fastened securely in coils.	Bags ..... Plastics Boxes ..... Fiberboard Tubes ..... Fiberboard Metal Plastics Dividing partitions in the outer Packagings.	Not necessary ..	Boxes. Steel (4A). Aluminum (4B). Wood, natural, ordinary (4C1). Wood, natural, sift proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fibreboard (4G).

DETONATOR, NON-ELECTRIC (1.4B) (UN0267)

HAZARD CLASSIFICATION OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name

DETONATOR, NON-ELECTRIC UN0267 1.4B

CFR 49 172.101 TABLE OF HAZARDOUS MATERIALS

DETONATOR, NON-ELECTRIC UN0267 1.4B

Special Provisions (column #7)

#103 Detonators which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to 1.4B classification code. Mass detonate means that more than 90 percent of the devices tested in a package explode practically simultaneously.

49 CFR 173.63 (g)

Packaging Exceptions

(g) Detonators that are classed as 1.4B or 1.4S and contain no more than 1 g of explosive (excluding ignition and delay charges) may be packed as follows in which case they are excepted from the packaging requirements of § 173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container is used as the outer packaging;

(3) No more than 1000 detonators in one outer packaging; and

(4) Each inner packaging is marked "1.4B Detonators" or "1.4S Detonators", as appropriate.

DETONATOR, ELECTRIC (1.4B) (UN0244)

HAZARDOUS CLASSIFICATION OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name

DETONATOR, ELECTRIC UNO244 1.4B

49 CFR 172.101 TABLE OF HAZARDOUS MATERIALS

DETONATOR, ELECTRIC UN0255 1.4B

Special Provisions (column #7)

#103 Detonators which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to 1.4B classification code. Mass detonate means that more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one detonator near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonators in the outside packaging that explode may not exceed 25 grams.

49 CFR 173.63 (f) & (g)

Packaging exceptions:

(f) Detonators containing no more than 1g explosive (excluding ignition and deadly charges) that are electric blasting caps with leg wires four feet long or longer, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing twelve feet long or longer, may be packed as follows, in which case they are excepted from the packaging requirements of § 173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container or compartment is used as the outer packaging;

(3) No more than 1,000 detonators in one outer packaging; and

(4) No material may be loaded on top of the IME Standard 22 container and no material may be loaded against the outside door of the IME standard 22 compartment.

(g) Detonators that are classed as 1.4B or 1.4S and contain no more than 1g of explosive (excluding) ignition and delay charges) may be packed as follows in which case they are excepted from the packaging requirements of § 173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container is used as the outer packaging;

(3) No more than 1,000 detonators in one outer packaging; and

(4) Each inner packaging is marked "1.4B Detonators" or "1.4S Detonators", as appropriate.

49 CFR 173.62 SPECIAL PACKING REQUIREMENTS FOR EXPLOSIVES

(Explosives Table) UN0267 PI# 131

Table of Packing Methods - Continued

Packing Instruction	Inner Packagings	Intermediate Packagings	Outer Packagings
131 ..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0029, 0267, and 0455, bags and reels may not be used as inner packagings. 2. For UN 0030, 0255, and 0455, inner packagings are not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool, so as to restrict freedom of movement of the caps and to protect them from impact forces. 3. For UN 0360, 0361, and 0500, detonators are not required to be attached to the safety fuse, metal-clad mild detonating cord, detonating cord, or shock tube, inner packagings are not required if the packing configuration restricts freedom of movement of the caps and protects them from impact forces.	Bags ..... Paper Plastics Receptacles .... Fiberboard Metal Plastics Wood Reels	Not necessary ..	Boxes. Steel (4A). Aluminum (4B). Wood, natural, ordinary (4C1). Wood, natural, sift proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fibreboard (4G). Drums. Steel, removable head (1A2). Aluminum, removable head (1B2). Fibre (1G). Plastics, removable head (1H2).

49 CFR 173.63 PA PACKAGING EXCEPTIONS (Enclosure 1)

(g) (2) IME Standard 22 container

Publication: Institute of Makers of Explosives SLP #22 May 1993

Publication: Guide for the Use of the IME 22 Container Oct. 1, 1993

IGNITER, M2/M60 F/TIME BLASTING FUSE (1.4S) (UN0131)

HAZARD CLASSIFICATION OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name:

LIGHTERS, FUSE 1.4S UN0131

49 CFR 172.101 TABLE OF HAZARDOUS MATERIALS

LIGHTER, FUSE 1.4S UN0131

49 CFR 173.62

Packaging Instruction #142

49 CFR ch. 1 (10-97 Edition) § 173.62

Table of Packing Methods - Continued

Packing Instruction	Inner Packagings	Intermediate Packagings	Outer Packagings
142	Bags ..... Paper Plastics Receptacles .... Fiberboard Metal Plastics Wood Sheets ..... Paper Trays, fitted with dividing partitions plastics	Not necessary ..	Boxes. Steel (4A). Aluminum (4B). Wood, natural, ordinary (4C1). Wood, natural, sift proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fibreboard (4G). Plastics, solid (4H2). Drums. Steel, removable head (1A2). Aluminum, removable head (1B2). Fibre (1G). Plastics, removable head (1H2).

FUSE, BLASTING TIME M700 (1.4S) (UN0105)

HAZARD CLASSIFICATION OF US MILITARY EXPLOSIVES AND MUNITIONS

Proper Shipping Name:

FUSE, SAFETY UN0105 1.4S

49 CFR 49 172.101 TABLE OF HAZARDOUS MATERIALS

FUSE, SAFETY UN0105 1.4S

49 CFR 173.62

Packing Instructions #140

Research and Special Programs Administration, DOT § 173.62

Table of Packing Methods - Continued

Packing Instruction	Inner Packagings	Intermediate Packagings	Outer Packagings
140 ..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. If the ends of UN 0104 are sealed, no inner packagings are required. 2. For UN 0101, the packaging must be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps. 3. For UN 0101, steel or aluminum boxes or drums must not be used.	Bags ..... Plastics Reels ..... Sheets ..... Paper, kraft Plastics	Not necessary ..	Boxes. Steel (4A). Aluminum (4B). Wood, natural, ordinary (4C1). Wood, natural, sift proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fibreboard (4G). Plastics, solid (4H2). Drums. Steel, removable head (1A2). Aluminum, removable head (1B2). Fibre (1G).

ATTACHMENT 2

FORMS

SHIPPING PAPER AND EMERGENCY RESPONSE INFORMATION FOR HAZARDOUS MATERIALS

THIS VEHICLE IS TRANSPORTING HAZARDOUS MATERIALS

Date Prepared:	Date of Travel:	Page_____of_____

Proper Shipping Name	Hazard	ID No.	PG	Qty/Units	Weight

Emergency notification. In all cases of accident, incident, breakdown or fire, prompt notification must be given.

FOR EMERGENCY RESPONSE INFORMATION, SEE BACK OF THIS FORM

Remarks:

Certification: 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.

Signature of Shipper Representative:	Signature(s) of Vehicle Operator(s):
24-Hour Emergency Assistance Telephone Numbers:	Work Hours Emergency Phone Numbers:

SHIPPING PAPER AND EMERGENCY RESPONSE INFORMATION FOR HAZARDOUS MATERIALS

THIS VEHICLE IS TRANSPORTING HAZARDOUS MATERIALS

Date Prepared:	Date of Travel:	Page
January 01, 2000	*January 01, 2000*	*1 of 1*

Proper Shipping Name	Hazard	ID No.	PG	Qty/Units	Weight
Cord, Detonating 80 gr per foot	*1.4D*	*UN0289*	*II*	*____FT*	
Charges, Shaped Commercial	*1.4S*	*UN0441*	*II*	*____EA*	
Detonators, Non-electric	*1.4B*	*UN0267*	*II*	*____EA*	
Lighters, Fuse	*1.4S*	*UN0131*	*II*	*____EA*	
Fuse, Safety	*1.4S*	*UN0105*	*II*	*____FT*	
Detonators, Electric	*1.4B*	*UN0255*	*II*	*____EA*	

Emergency notification. In all cases of accident, incident, breakdown or fire, prompt notification must be given.

FOR EMERGENCY RESPONSE INFORMATION, SEE BACK OF THIS FORM

Remarks:

PAGE 1 EXAMPLE

Certification:

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.

Signature of Shipper Representative:	Signature of Vehicle Operator(s):

24-Hour Emergency Assistance Telephone Numbers:	Work Hours Emergency Phone Numbers:
–	*(915) 555-2351*
(915) 555-0229	*Cellular Phone*
	(915) 555-3217

EMERGENCY RESPONSE INFORMATION

Guide Number 46 and 50 from the U.S. Department of Transportation Emergency Response Guide Book P 5800.6 are reproduced hereon. These guides are applicable to Hazard Class 1 Materials (Explosives).
Mark an X in the appropriate box:

☐ **USE GUIDE 46 FOR EXPLOSIVES (1.1), (1.2), (1.3), (1.5), AND (1.6)**

☐ **USE GUIDE 50 FOR EXPLOSIVES (1.4)**

For all other hazardous materials or substances, annotate appropriate Emergency Response Guide Book Guide Number in the block below, and attach a copy of the guide number page or pages.

Guide Numbers:

GUIDE 46 (ERG 93)

POTENTIAL HAZARDS

FIRE OR EXPLOSION:

May explode and throw fragments 1 mile or more if fire reaches cargo.

HEALTH HAZARDS:

Fire May produce irritating or poisonous gases.

EMERGENCY ACTION

If fire reaches cargo, do not fight fire.

If you know or suspect that heavily-encased explosives, such as bombs or artillery projectiles are involved, stop all traffic and begin to evacuate all persons, including emergency responders, from the area in all directions for 5000 feet (1 mile) for rail car or 4000 feet (3/4 mile) for tractor/trailer.

When heavily-encased explosives are not involved, evacuate the area for 2500 feet (½ mile) in all directions.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.

CALL Emergency Response Telephone Number on Shipping paper FIRST. If Shipping Paper NOT AVAILABLE or NO ANSWER, CALL CHEMTREC AT 1-800-424-9300.

FIRE

Cargo Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO. Withdraw from area and let fire burn.

Truck and Equipment Fires: Try to prevent fire from reaching the explosive cargo compartment. Flood with water; if no water is available use Halon, dry chemical or earth.

Promptly isolate the scene by removing ALL PERSONS from the vicinity of the incident if there is a fire. First, move people out of line-of-sight of the scene and away from windows. Then, obtain more information and specific guidance from competent authorities listed on the shipping papers.

SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area. Do not touch or walk through spilled material.

FIRST AID

Call emergency medical care.
Use first aid treatment according to the nature of the injury.

GUIDE 50 (ERG 93)

POTENTIAL HAZARDS

FIRE OR EXPLOSION:

May explode and throw fragments 1/3 mile or more if fire reaches cargo.

HEALTH HAZARDS:

Fire May produce irritating or poisonous gases.

EMERGENCY ACTION

If fire reaches cargo, do not fight fire.

Stop all traffic and begin to evacuate all persons, including emergency responders, from the area for 1500 feet (1/3 mile) in all directions.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.

CALL Emergency Response Telephone Number on Shipping paper FIRST. If Shipping Paper NOT AVAILABLE or NO ANSWER, CALL CHEMTREC AT 1-800-424-9300.

FIRE

Cargo Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO. Withdraw from area and let fire burn.

Truck and Equipment Fires: Try to prevent fire from reaching the explosive cargo compartment. Flood with water; if no water is available use Halon, dry chemical or earth.

Promptly isolate the scene by removing ALL PERSONS from the vicinity of the incident if there is a fire. First, move people out of line-of-sight of the scene and away from windows. Then, obtain more information and specific guidance from competent authorities listed on the shipping papers.

SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area. Do not touch or walk through spilled material.

FIRST AID

Call emergency medical care.
Use first aid treatment according to the nature of the injury.

SUPPLEMENTAL INFORMATION

Packages bearing the 1.4S label contain explosive substances or articles that are designed or packaged in such a manner that when involved in a fire, may burn vigorously with localized detonations and projection of fragments; effects are usually confined to immediate vicinity of packages.

If fire threatens cargo area containing packages bearing the 1.4S label, consider initial isolation of at least 50 feet in all directions. Fight fire with normal precaution from a reasonable distance.

EODT EXPLOSIVES PURCHASE/RECEIPT/TRANSPORTATION AUTHORIZATION LIST

Address and County: (Home Office)

Address and County: (Field Office)

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 120E/F-2

EODT EXPLOSIVES PURCHASE/RECEIPT/TRANSPORTATION AUTHORIZATION LIST

Address and County: (Home Office): *10938 Hardin Valley Rd. Knoxville, TN 37932*

Address and County: (Field Office): **1000 Main Street, Sink Hole, New Jersey 01020**

Federal License #: *1 TN-001-33-OH-97374* Expiration Date: *August 1, 2000*

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
Sean Connery	PA 102030405	123-34-4567	Glencoe, Scotland
Roger Moore	NY 01020304	987-76-6543	Hometown USA

EXAMPLE FORM

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

Team # _____

EODT VEHICLE INSPECTION CHECKLIST

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

te Name / Location: _____

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

te 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*	[ ]	[ ]

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

iption of deficiencies: _____

_____

_____

iencies corrected by: _____ Date: _____

EODT 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 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will ensure that this SOP is implemented for excavation or trenching 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 implement the 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.

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 occurrence. The competent person shall complete the Daily Excavation Checklist (see Figure 2) each time the excavation 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 from 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 a least two feet from the edge of the excavation;
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 shall be removed prior to personnel entry;
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, as well as the requirements of 29 CFR 1910.146 and EM 385-1-1;
17. All excavations or trenches shall be properly barricaded or flagged off to prevent personnel from accidentally falling into the excavation or trench; and
18. In accordance with the requirements of 29 CFR 1926.651(g), if an excavation or trench is greater than 4 feet in depth, and the potential exists for having a hazardous atmosphere inside the excavation or trench, then the atmosphere shall, as a minimum, 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 in accordance with 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

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. Site personnel will comply with the SSHP and all other required safety and health guidelines.
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, and drinking, will be allowed only in designated areas while personnel are performing operations within a work zone.
11. If site hazards include the potential for airborne or physical contact with chemical contaminants, personnel will refrain from eating, drinking, using tobacco, applying cosmetics or any other hand to face activity while they are in the area of chemical contamination. This requirement will hold true at all times unless procedures are specified in the SSHP which allow for the taking of breaks in the work zone.
12. Ignition of flammable materials in any work zone is prohibited, unless directed by the SSHO.
13. Buddy System procedures shall be enforced during all site operations.
14. 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.
15. Site personnel shall check in with the SSHO prior to leaving the site, and again upon returning to the site.
16. Site personnel will report to the SSHO any medical conditions or medications which could affect their ability to perform operations safely.
17. 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.
18. Site personnel shall perform only those tasks which they are trained and qualified to perform.
19. Site personnel shall remain aware of site conditions at all times and shall alert the SSHO to any changes which could pose additional hazards.
20. "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.

APPENDIX H

OF THE

WORK PLAN

FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

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:

EODT
EOD TECHNOLOGY, INC.

2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

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	LOWER	UPPER
100F min (TCC)	257 C (495F)	% by volume	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

ECTION VI. HEALTH HAZARD INFORMATION

TLV 5 mg/m^3 oil (mist) (See Sect II)

nalation 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).

emical pneumonitis may result when ingestion occurs and oil is aspirated in the lungs.

RST 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.

ek medical assistance for further treatment, observation and support.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

otify safety personnel of leaks or spills. Remove sources of heat or ignition.

rovide 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.

ISPOSAL: May be disposed of by a licensed waste disposal company, or by controlled incineration or burial in an approved landfill.

ollow Federal, State and Local regulations. Report large oil spills.

SECTION VIII. SPECIAL PROTECTION INFORMATION

rovide 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.

aunder soiled or contaminated clothing before reuse (at least weekly laundering of work clothes is recommended).

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

tore 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.

void prolonged skin contact and breathing of vapors or mists.

o 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

IA SOURCE(S) CODE: 1,6,7,12

APPROVALS: MIS J. M. Miller

CRD

Industrial Hygiene and Safety 10-13-81

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.

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.

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.

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 (H20=1)

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

...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

Not applicable NDA = No data available < = Less than > = More than

...ve the statements, technical information and recommendations contained herein are reliable. However, the data is provided with...
...ed or implied, ...

nhalation
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

yes
Flush eyes with large amounts of water for 15 minutes. If eyes become inflamed, seek medical advice.

kin
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.

ngestion
Do not induce vomiting unless instructed to do so by a physician. Call your local poison control center or get medical attention.

nhalation
Remove to fresh air. If not breathing, give mouth to mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

tes to Physician
This material, if aspirated into the lungs, may cause chemical pneumonitis; treat the affected person appropriately.

Section 5 - FIRE FIGHTING MEASURES

ash Point	Method Used
0 deg F (204 deg C)	Cleveland Open Cup

UFL	LFL	Auto Ignition
t determined	Not determined	Not determined

Flammability Classification	Rate of Burning
IB	Not determined

neral Fire Hazards
This product is combustible at high temperatures.

zardous Combustion Products
Carbon dioxide, carbon monoxide, oxides of sodium, calcium, magnesium, phosphorus, and zinc.

tinguishing Media
Dry chemical or carbon dioxide for small fires. Water spray or foam for large fires.

e 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...

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

Additicnal Properties
None

Section 10 - CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability: Stable
onditions to Avoid: Avoid excessive heat and all sources of ignition.
ncompatibility
Strong oxidizing agents (peroxides, chlorine, strong acids).
azardous Decomposition Products
At thermal decomposition temperatures carbon dioxide, carbon monoxide, oxides of calcium, magnesium, phosphorus, and zinc.
azardous Polymerization
Hazardous polymerization will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

cute 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
pidemiology
No data available for product.
arcinogenicity
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.
eratogenicity/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.

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).

tate 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.

ther 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

ther 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
y/Legend
NA = Not Applicable; ND = Not Determined; Y = Yes; N = No
ntact Person: D. W. Cralley - Corporate Manager, Health and Safety
Phone: (814)676-7676

End of MSDS #QS-021

MIT VALUE (TLV-TWA) Not available	LC_{50} Not available
XPOSURE WHEN:	Allergen, possible faintness & lowered blood pressure. Also see 'Ingested'.
ACT WITH EYES	Irritation
ACT WITH SKIN	Irritation
D	Dizziness, cramps, vomiting, possible methemoglobinemia, weakness, depression, headache
ND CEDURES ON	Remove to fresh air. If not breathing, give artificial respiration. Keep warm & at rest. Obtain medical attention.
	Flush eyes with running water for at least 20 minutes, holding eyelids open. Obtain medical attention.
	Remove contaminated clothing. Flush affected area with running water for 20 minutes. If irritation persists, obtain medical attention.
ON	If conscious; give large amounts of water or milk to induce vomiting. Obtain medical attention.

Special Protection Information

REQUIREMENTS	Local ventilation preferred
PROTECTION	Air purifying respirator approved by NIOSH/MSHA equipped with dust, mist, fume cartridges, if necessary
LOVES	Impermeable gloves — EYE PROTECTION Safety glasses
CTIVE EQUIPMENT	Protective clothing as required

Special Requirements

HANDLING	Protect containers against physical damage. Store in cool dry well-ventilated building, preferably noncombustible equipped with automatic sprinkler protection. Floor drains & 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

Spill or Leak Procedures

EN IN EVENT OF E. IN ALL CASES LE GOVERNMENT ILL 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.
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.
EMICALS	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.
	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.

References

N.I., Dangerous Properties of Industrial Materials, 5th Ed., Van Nostrand Reinhold, 1979.
and Hazardous Industrial Chemicals Safety Manual, The International Tech. Info. Inst., Japan, 1979.

SECTION V HEALTH HAZARD DATA

HOLD LIMIT VALUE

Not Applicable

TS OF OVEREXPOSURE

ENCY AND FIRST-AID PROCEDURES

SECTION VI REACTIVITY DATA

ITY	UNSTABLE	CONDITIONS TO AVOID
N/A	STABLE	

PATIBILITY
ls to avoid)

DOUS
POSITION PRODUCTS

DOUS POLYMERIZATION		CONDITIONS TO AVOID
ccur	Will Not Occur	

SECTION VII SPILL OR LEAK PROCEDURES

TO BE TAKEN
E MATERIAL IS
ED OR SPILLED

Safe for humans to handle

DISPOSAL METHOD

Any Sewer

SECTION VIII SPECIAL PROTECTION INFORMATION

TORY PROTECTION
Type)

Not Applicable

TION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (general)	OTHER

TIVE GLOVES	EYE PROTECTION

TIVE
ENT

SECTION IX SPECIAL PRECAUTIONS

TIONS TO BE
HANDLING
RING.

Protect from freezing

RECAUTIONS

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.

****

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 incldiuing 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 route of exposure.

NOTE: Seek prompt medical attention if detonation caused physical injury.

****

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 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

Manufactured By: THE ENSIGN-BICKFORD COMPANY

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:

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

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

APPENDIX I

OF THE

WORK PLAN

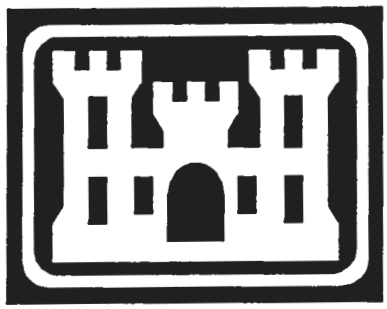
FOR THE

ORDNANCE AND EXPLOSIVES OPERATIONS
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

PROPERTY MANAGEMENT PLAN

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

Prepared For:



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

Prepared By:

EODT
EOD TECHNOLOGY, INC.

2229 Old Highway 95
Lenior City, Tennessee 37932

March 1999

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1.0 INTRODUCTION

1.1 POLICY STATEMENT

It is the policy of EOD Technology, Inc. (EODT) to meet or exceed Federal Government property control guidelines. In compliance with this policy, EODT and its subcontractor personnel are obliged to adhere to the policies, procedures and practices contained in this Program during the performance of all Government contracts managed by EODT.

1.2 OBJECTIVE

The objective of this Property Management and Control Program (PMCP) is to outline the procedures and acceptable practices to be used for the management of all Government owned property used by EODT in the execution of its contracts with the Government. This PMCP contains a standardized system for the control, protection, preservation, maintenance and tracking of Government equipment.

1.3 SCOPE

This program shall apply to all Government property and equipment provided to EODT during the performance of any Federal Government contract or subcontract awarded to, and managed by, EODT. This Program also applies to any Government property or equipment furnished by the Government for use by EODT subcontractors in the execution of a Federal Government contract.

1.4 APPLICATION

The Federal Acquisition Regulation (FAR) Part 45 applies to Government property that will be controlled and used by EODT or its subcontractors. If the provisions of a particular Government contract conflict with any aspect of this PMCP, or EODT management and accounting policies, the specific contract provision shall govern and apply to the execution of the particular Government contract. Portions of this Program shall be amended, as needed, to reflect specific contract requirements for the use of Government property.

2.0 DEFINITIONS

The terms used in this PMCP are defined in FAR 45.501. These pre-defined terms, along with some Program specific definitions are presented below and shall apply to the implementation of this Program.

- **Acquisition:** The process of acquiring Government property either through requisition or transfer from Government sources or through purchase, including those made through contractor stores.
- **Contaminated Property:** Equipment or supplies that have been exposed to radioactive or toxic waste, chemicals, materials, or environments that have rendered them unsafe to use.

- Project Manager (PM): The EODT employee responsible for the operational performance of a project under a Government contract. This employee may be assigned to manage the project from either the project site, or the corporate office.
- Project Officer: The technical representative of the CO who is responsible for monitoring the contractor's contract performance and providing property justification to the CO.
- Site Manager (SM): The senior on-site EODT employee assigned to a project who is responsible for the on-site implementation of this Program.

3.0 EODT PERSONNEL RESPONSIBILITIES

During the performance of a Government contract, the EODT personnel assigned to the positions listed below shall be responsible for the implementation of the this Program.

3.1 DIRECTOR OF OPERATIONS

During the performance of a Government contract, the EODT Director of Operations (DOO) will be responsible for the overall implementation of this Program, to include the following:

- Monitoring EODT's general compliance with the PMCP procedures;
- Implementing and enforcing the PMCP for EODT Government contracts;
- Coordinating with the EODT Contract Administrator (CA) to ensure compliance with contract terms, modifications and other contract administration requirements related to GFP;
- Serving as the primary EODT point of contact with the GPA regarding the guidelines set forth in the PMCP as they apply to Government contracts;
- Ensuring that all GFP is properly marked or tagged and keeping inventory records up to date;
- Coordinating with the SM to ensure that all GFP is maintained and calibrated in accordance with (IAW) the manufacturer's recommended service schedule and documenting all maintenance, repair and service; and
- Auditing the contract records to ensure site compliance with this Program.

3.2 PROJECT MANAGER

During the performance of a contract to which the PM has been assigned, the PM will be responsible for the following:

- Ensuring that all EODT and subcontractor personnel who are involved in the acquisition, and use of Government property in support of a given contract comply with the PMCP ;
- Providing direction and consultation to the SM for the implementation of the PMCP for contracts for which the PM is responsible;
- Having the ultimate authority and responsibility to control, maintain, protect and preserve GFP in the possession of EODT at the project site;
- Reporting to the GPA, as soon as details become available, any loss, damage or destruction (LDD) of any Government property;

4.0 EODT RESPONSIBILITY

EODT will be directly responsible and accountable for all Government property IAW their Government contracts and FAR 45.500. This includes Government property in the possession or control of an EODT subcontractor. IAW with this Program, EODT shall maintain and make available to the Government all records generated or received by EODT used for the accounting of Government property until EODT is relieved of the responsibility. EODT shall be responsible for the control of Government property incident to the following:

- Delivery of GFP into EODT's custody or control;
- Delivery, when property is purchased by EODT and the contract calls for reimbursement by the Government;
- Issuance of Government property withdrawn from EODT-owned stores for use in the contract performance and charged directly to the contract; or
- Upon acceptance of property title by the Government when the property is acquired pursuant to specific contract clauses or as a result of change orders.

The EODT SM shall promptly report to the GPA in writing all Government property received in excess of the amounts needed to complete full performance of the contract which provides for or authorizes the use of the Government property. In the event that unrecorded Government property is located on site, both the cause of the discrepancy and the actions to be taken to prevent recurrence shall be determined and reported in writing to the GPA. As directed by the GPA, the SM will take such actions as needed to rectify the situation.

5.0 RECORDS AND REPORTS OF GOVERNMENT PROPERTY

5.1 GENERAL REQUIREMENTS

As required by FAR 45.505, EODT shall establish and maintain adequate control records for all Government property, including property provided to and in the possession or control of an EODT subcontractor. The EODT Government property records identified in this Program have been designed to identify all Government property and provide a complete, current, auditable record of all transactions. For each project site where Government property is to be used, the SM will be responsible for maintaining on-site files, and the DOO shall be responsible for maintaining contract files, both of which will contain the Government property records and reports required by, and presented in, this Program. The EODT DOO shall establish and maintain separate property records for each contract. The records and reports to be maintained shall include any reports sent to the GPA and copies of all EODT documentation relevant to the receipt, use, maintenance and disposition of government property.

5.2 BASIC INFORMATION

To record the receipt of, and to track the disposition of Government property, the SM shall record all Government property received on an EODT Property Control and Tracking Card (see Figure 1).

The EODT SM shall maintain records of all scrap or salvage generated as a result of site activities. Prior to placement into any scrap/salvage storage containers, the SM will ensure that the scrap/salvage has been inspected according to established EODT quality control procedures contained in the project plans. This inspection system has been designed to ensure that no hazardous components or materials are placed into the scrap/salvage storage container. To record scrap or salvage, the SM will utilize the EODT Scrap and Salvage Log (see Figure 3), which provides for the recording of the following information:

- Project name and location;
- Contract and delivery order number;
- Description of the salvaged items or scrap;
- Running total of current quantity on hand;
- Posting reference and date of transaction; and
- Disposition.

6.0 PROPERTY ACQUISITION

The SM will be responsible for preparing quantity and technical specification requirements for each piece of equipment to be used on the project. These requirements will be forwarded to the PM for review. Once approved, the equipment requirements shall be forwarded to the EODT Contract Administrator (CA), who is responsible for the implementation of EODT purchasing policies, and for the acquisition of equipment IAW applicable FAR regulations. For CAP, the CA will obtain three quotes and perform a lease purchase analysis for each item not available from government sources. If GFP may be available for issue to a contract, the CA will contact and coordinate with the Government CO to determine availability and the terms of acquisition.

Equipment and materials purchased on an overhead account may be stored in a segregated central location and transferred out to projects on an as needed basis (as determined by the PM). This type of acquisition will be for expendable property and materials only (i.e., gloves, rubber boots and other basic personal protective equipment items, paper towels, electrolyte replacement solutions and mixes, etc.) that have an individual item value less than $50.00. These items may be purchased initially in large quantities to reduce the overall cost per item.

7.0 RECEIPT OF GOVERNMENT PROPERTY

7.1 GENERAL REQUIREMENTS

EODT shall furnish written receipts for all specified classes of Government property when the GPA deems it essential for maintaining minimum acceptable property controls. If evidence of receipt is required for CAP, EODT shall provide the evidence of receipt before submitting its request for payment of the CAP. For GFP, EODT shall furnish a written hand receipt immediately upon receipt and acceptance of the property.

packaging slip shall be maintained on site and the originals will be forwarded to the DOO for inclusion in the contract file. Prior to the submission of a request for payment for CAP, EODT shall provide the GPA with a copy of the supplier's packaging slips and/or invoices for payment, along with the EODT Property Control and Tracking Card as documentation of the receipt of CAP.

7.4 DOCUMENTATION OF THE RECEIPT OF GFP

Upon receipt of GFP, each item will be inspected to determine its identity, condition and usability. The SM will ensure that all GFP is marked IAW the requirements of para 5.2 and the receipt of the GFP will be documented on the EODT Property Control and Tracking Card. Once the GFP has been recorded on the Property Control Card(s), the SM shall ensure that the EODT Property Control and Tracking Card(s) are properly filed on site and will forward a copy of the card(s) to both the DOO, for inclusion in the contract files, and the GPA to document receipt of the GFP.

7.5 DISCREPANCIES INCIDENT TO SHIPMENT AND RECEIPT

7.5.1 Contractor-acquired Property

The EODT SM and/or PM shall take all actions necessary to adjust overages, shortages or damages incident to the shipment of CAP from a supplier or vendor. However, when the shipment has been moved by Government bill of lading and carrier liability is indicated, EODT shall report the discrepancies IAW the provisions of para 7.5.2.

7.5.2 Government-furnished Property

If overages, shortages or damages are discovered upon receipt of GFP, the EODT SM or PM shall provide a written statement of the condition and apparent causes to the GPA. Only the quantity of GFP actually received will be recorded by the SM or PM using the EODT Property Control and Tracking Card(s).

8.0 SEGREGATION OF GOVERNMENT PROPERTY

Government property shall be kept physically separate from EODT-owned property. However, when advantageous to the Government and consistent with EODT's authority to use such Government property, the GPA may approve the commingled storage of Government and EODT property. Combined storage will be allowed provided that Government property is clearly identified and recorded as Government property IAW para 7.2 of this Program.

9.0 PHYSICAL INVENTORIES

EODT shall periodically conduct project specific physical inventories of all Government property in its possession or control. This requirement will also apply to any EODT subcontractors in control of Government property. Physical inventories shall, as a minimum, be conducted on a monthly basis for the duration of the contract for each project. Upon conclusion of the project, the procedures outlined in para 9.0 of this Program shall be followed concerning final physical inventory.

- All Government property and equipment shall be visually inspected at least weekly to determine proper function and reliability and to detect any defect, maladjustment, wear or impending failure;
- All Government property and equipment shall receive regularly scheduled service and maintenance as required by the manufacturer, or as specified in any instruction manuals;
- Any worn, damaged or otherwise compromised Government property, or its components, will be replaced as soon as possible;
- Defective or worn parts or components shall be replaced using manufacture's recommended parts/components, and shall be replaced by only those personnel authorized to do such repairs;
- Special tools or accessories furnished with Government property but not regularly used with it shall be stored in a designated area specified by the SM; and
- Documentation of inspection and maintenance shall be recorded in the SM or Team Leader daily operational log books.

11.0 LIABILITY FOR LOSS, DAMAGE OR DESTRUCTION

Subject to the terms of the contract and the circumstances surrounding the particular case, EODT may be liable for LDD of GFP in its possession. EODT may also be liable for use or consumption of Government property that unreasonably exceeds the allowances provided by the contract or other appropriate criteria. EODT and its subcontractors shall investigate and report to the GPA all cases of LDD according to the following:

- EODT shall provide information about LDD to the GPA as soon as facts become known;
- EODT subcontractors shall provide information to the SM regarding LDD as soon as facts relevant to the LDD become available;
- Reports for LDD shall contain a memorandum and any other support documents needed to accurately present the causes for the LDD; and
- Reports of LDD shall be maintained on site, with a copy sent to the DOO for inclusion in the project contract file.

For each case of LDD of Government property, the following information should be provided to the designated EODT PM:

- Date of incident;
- Date of report;
- Description of property, including applicable identification number;
- Contract number;
- Acquisition cost;
- Full narrative of the incident, location, etc.;
- Corrective action taken to prevent recurrence;
- Estimated scrap proceeds (when applicable);
- Repair labor and materials cost (when applicable);

PM will immediately take such actions as necessary to correct the noncompliance. If the noncompliance involves discrepancies in the inventory of GFP, the SM will notify the GPA in writing of the discrepancy and will correct the discrepancy. Copies of internal audit reports shall be maintained on site and in the contract file.

14.0 CONDITION CODES

The following condition codes shall be used when determining the condition of GFP and CAP at the time of receipt and disposition:

- UNG — Unused-good: Unused property that is usable without repair or modification and is identical or interchangeable with new items from normal supply sources.
- UNF — Unused-fair: Unused property that is usable without repair or modification, but is slightly deteriorated or damaged to the extent that it is no longer identical or interchangeable with new items available from normal supply sources.
- UNP — Unused-poor: Unused property that is usable without repairs or modification, but is considerably deteriorated or damaged. However enough utility remains as to classify the property better than salvage.
- UG — Used-good: Used property that is usable without repairs, but is somewhat worn or deteriorated and may soon require repairs.
- UF — Used-fair: Used property that is usable without repairs, but is considerably worn or deteriorated to the degree that remaining utility is limited or significant repairs will soon be required.
- UP — Used-poor: Used property that may still be used without repairs, but the item is considerably worn or deteriorated to the degree that remaining utility is limited and significant repairs will soon be required.
- RRMIN — Repair required-minor: Property is unusable in its current state due to the required repairs. Repairs needed are minor and have been estimated to not exceed 15 percent of the original acquisition cost.
- RRMOD — Repair required-moderate: Property is unusable in its current state due to the required repairs. Repairs are considerable and are estimated to range from 16 to 40 percent of the original acquisition cost.
- RRMAJ — Repair required-major: Property is unusable due to required repairs. Repairs are major because property is badly damaged, worn or deteriorated and are estimated to range from 41 to 65 percent of the original acquisition cost.
- SAL — Salvage: Property that has some value in excess of its basic material content, but repair or rehabilitation to usefulness is clearly impractical. Repair for any use would exceed 65 percent of the original acquisition cost.
- SCRAP — Scrap: Material that has no value except for its basic material content.
- EXP — Expended: Property that has been consumed in the performance of the work.
- MISS — Missing: Property that is lost, stolen or missing.

FORM DD-1662

DOD PROPERTY IN THE CUSTODY OF CONTRACTORS (DFARS 245.505-14) *(See Instructions on reverse before completing this form.)*	REPORT AS OF 30 SEP 19____ OR _____	*Form Approved* *OMB No. 0704-0246* *Expires Oct 31, 1991* REPORT CONTROL SYMBOL

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0246), Washington, DC 20503.

1. TO *(Enter name and address of property administrator)*	2. FROM *(Enter full name, address and CAGE code of contractor)*

3. IF GOVERNMENT-OWNED, CONTRACTOR-OPERATED PLANT, ENTER GOVERNMENT NAME OF PLANT			
4. CONTRACT NO. *(PIIN)*	5. CONTRACT PURPOSE	6. BUSINESS TYPE *(L, S, or M)*	7. OFFICIAL NAME OF PARENT COMPANY

8. PROPERTY LOCATION(S)	9. PLANT EQUIPMENT PACKAGE *(PEP No. and use)*

a. PROPERTY *(Type or Account)*	b. BALANCE BEGINNING OF PERIOD		c. ADDITIONS *(in dollars)*	d. DELETIONS *(in dollars)*	e. BALANCE END OF PERIOD	
	(1) Acquisition Cost *(in dollars)*	(2) Quantity *(in units or acres)*			(1) Acquisition Cost *(in dollars)*	(2) Quantity *(in units or acres)*
10. LAND						
11. OTHER REAL PROPERTY						
12. OTHER PLANT EQUIPMENT						
13. INDUSTRIAL PLANT EQUIPMENT						
14. SPECIAL TEST EQUIPMENT						
15. SPECIAL TOOLING *(Government Title Only)*						
16. MILITARY PROPERTY *(Agency-Peculiar)*						
17. GOVERNMENT MATERIAL *(Government-Furnished)*						
18. GOVERNMENT MATERIAL *(Contractor-Acquired)*						

CERTIFICATION

I certify that this report was prepared under DoD requirements from records maintained under FAR 45.5 and DFARS 245.5.

19. CONTRACTOR REPRESENTATIVE		
a. TYPED NAME *(Last, First, Middle Initial)*	b. SIGNATURE	c. DATE SIGNED *(YYMMDD)*

20. DOD PROPERTY REPRESENTATIVE		
a. TYPED NAME *(Last, First, Middle Initial)*	c. SIGNATURE	d. DATE SIGNED *(YYMMDD)*
b. TELEPHONE NUMBERS *(Commercial and Autovon)*		

DD Form 1662, MAR 89 *Previous editions are obsolete.* 1180-071

Figure 2

EODT PHYSICAL INVENTORY LOG

d Location:			Contract Number:					Delivery Order Nun
lame / Description	National Stock No. [1]	EODT Serial No. [2]	Model Number [3]	Serial Number [3]	Quantity Received	Quantity On Hand	Discrepance Noted [4]	Com

vided by the Government. 2- Serial number assigned IAW para 7.2.2 of this Program. 3 - Manufacturer's Model and Serial Numbers. 4 - Report of discrepancies is requir

Figure 4a