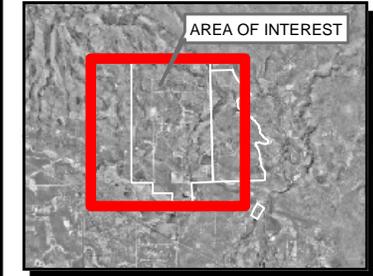


Legend

- Estimated Visual Survey Transect
- Geophysical Survey Transect
- ▭ Upper Burning Ground MR Site
- ▭ BLM Restricted Use Area MR Site
- ▭ RCRA ISD Authority Area (excluded areas)
- ▭ Completed under IRP (excluded areas)

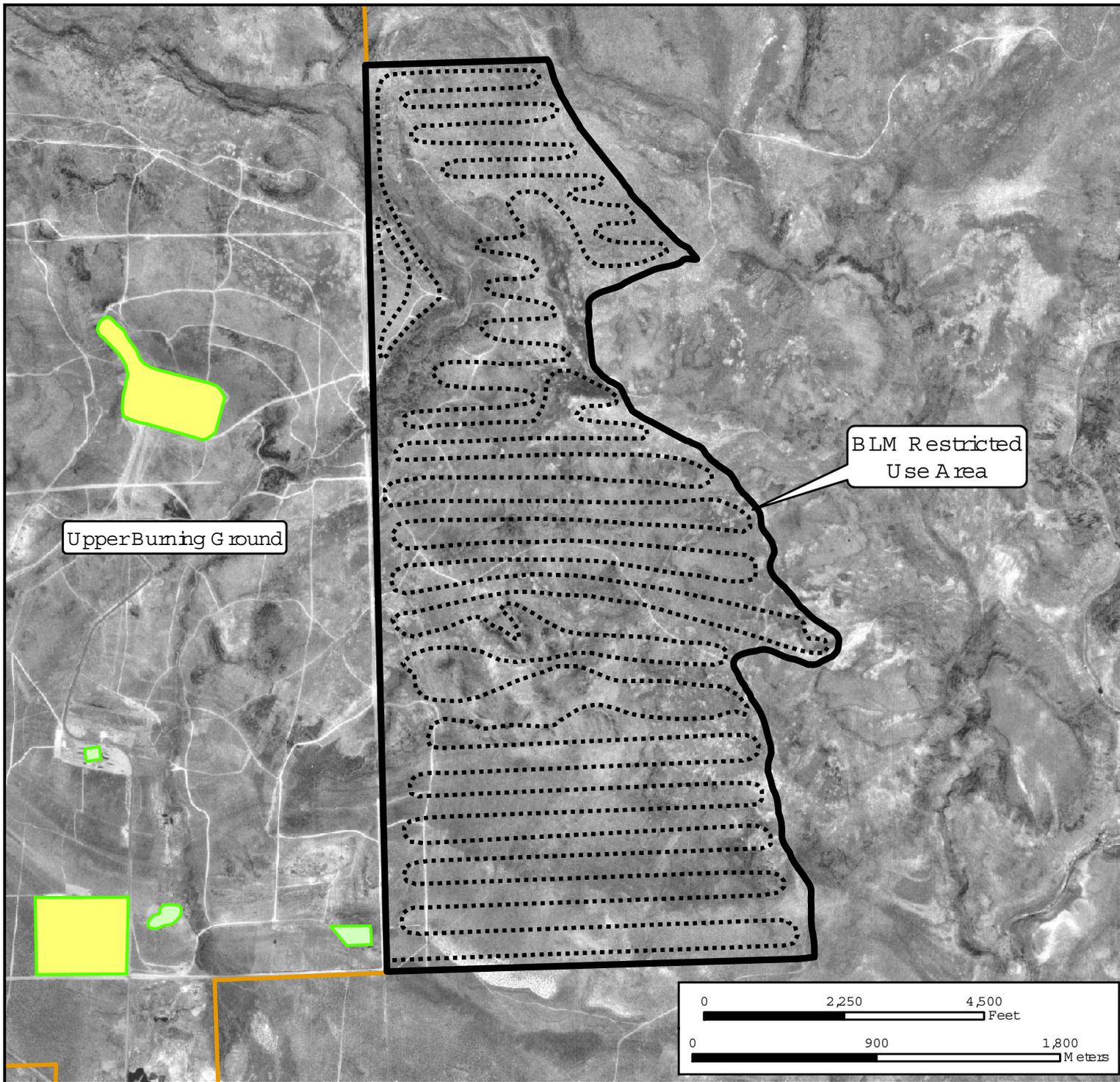


- ### Notes and Source Data
- 1) Survey datum is NAD 83
UTM Meters Zone 17
 - 2) Aerial Photogrammetry USGS
July 27, 1993
 - 3) Areas completed under IRP
are approximated based on
figures provided by Arcadis

Expected Field Work Required
 Acres: 4,070
 Soil Samples: 40
 Visual Survey (Line miles): 30
 Geophysical: 1 acre

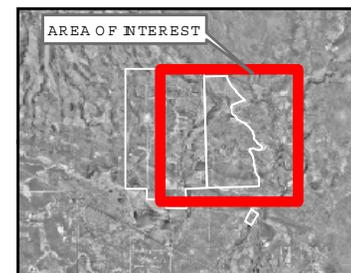


Figure A-2
Upper Burning Ground MR Site
Upper Burning Ground
Sierra Army Depot, CA
 April 2007



Legend

- Estimated Visual Survey Transect
- ▭ BLM Restricted Use Area M R Site
- ▭ Upper Burning Ground M R Site
- ▭ RCRA ISD Authority Area (excluded areas)
- ▭ Completed under IRP (excluded areas)



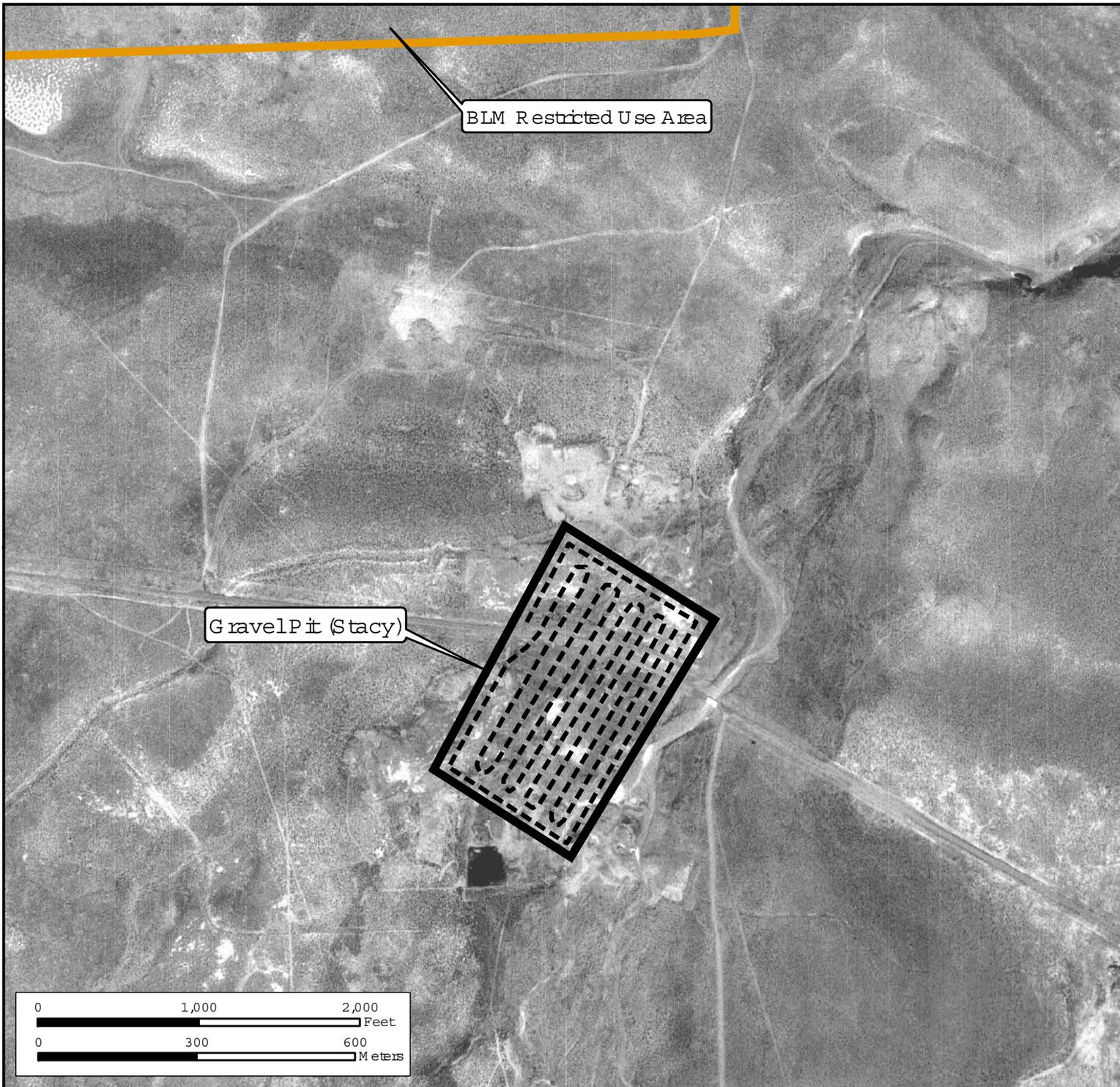
Notes and Source Data

- 1) Survey datum is NAD 83 UTM Meters Zone 17
- 2) Aerial Photography USGS July 27, 1993
- 3) Areas completed under IRP are approximated based on figures provided by Arcadis

Expected Field Work Required
 Acres: 1,773
 Soil Samples: 15
 Visual Survey (Line miles): 12
 Geophysical: 0



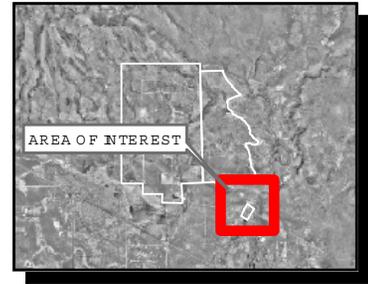
Figure A-3
 BLM Restricted Use Area M R Site
 Upper Burning Ground
 Sierra Army Depot, CA
 April 2007



Z:\S\kenn USBG\ArcGIS\Gravel_Pit_Sites\ymxd

Legend

- Estimated Visual Survey Transect
- Gravel Pit (Stacy) MR Site
- BLM Restricted Use Area MR Site



Notes and Source Data

- 1) Survey datum is NAD 83
UTM Meters Zone 17
- 2) Aerial Photography USGS
July 27, 1993

Expected Field Work Required
 Acres: 41
 Soil Samples: 15
 Visual Survey (Line Miles): 5
 Geophysical: 0



E

Figure A-4
 Gravel Pit (Stacy) MR Site
 Upper Burning Ground
 Sierra Army Depot, CA
 April 2007

ATTACHMENT 2
STANDARD OPERATING PROCEDURES
ENSY5 SOIL TEST KIT

STRATEGIC DIAGNOSTICS INC.

TNT EnSys[®] SOIL TEST SYSTEM

RAPID FIELD SCREEN

User's Guide

IMPORTANT NOTICE

The range of this test is between 1 and 30 ppm TNT/TNB/DNT. The relative standard deviation is 8%. The least detectable concentration is 0.7 ppm (TNT).

This test system should be used only under the supervision of a technically qualified individual who is capable of understanding any potential health and environmental risks of this product as identified in the product literature. The components must only be used for the analysis of soil samples for the presence of TNT. After use, the kits must be disposed of in accordance with applicable federal and local regulations.

PHASE 1 TEST PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

ITEMS INCLUDED IN TEST KIT

- | | | |
|--|--|---|
| <input type="checkbox"/> 2 Cuvette stopper plugs | <input type="checkbox"/> 20 Extraction jars | <input type="checkbox"/> 1 TNT control ampule |
| <input type="checkbox"/> 1 Ampule cracker | <input type="checkbox"/> 1 Bulb pipette | <input type="checkbox"/> 20 - 30cc syringes |
| <input type="checkbox"/> 20 Syringe filters | <input type="checkbox"/> 1 Developer solution | <input type="checkbox"/> 20 Weigh boats |
| <input type="checkbox"/> 20 Wooden spatulas | <input type="checkbox"/> 1 - 50mL graduated conical tube | |

ITEMS NOT INCLUDED IN TEST KIT

- | | | |
|--|--|--|
| <input type="checkbox"/> 2 matched HACH cuvettes | <input type="checkbox"/> Acetone | <input type="checkbox"/> Waste container |
| <input type="checkbox"/> Paper towels | <input type="checkbox"/> Hach DR/2000 or DR/2010 | <input type="checkbox"/> Balance |
| <input type="checkbox"/> Disposable gloves | <input type="checkbox"/> Calculator | |

READ BEFORE PROCEEDING

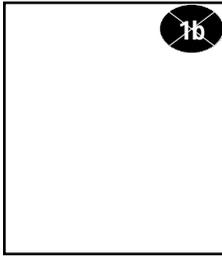
- For some matrices, air drying the soil samples may result in better TNT recovery or more reproducible data.
- A slightly modified protocol should be used if the primary analyte of concern is DNT. Please refer to the modification outlined on page 6.
- It is recommended that a control be run each day. See page 8 for instructions.
- SDI's EnSys® TNT Soil Test System is designed for use with either of Hach models **DR/2000** or the newer **DR/2010** spectrophotometers. Protocols for use of both instruments are provided in this User's Guide. Ensure the instrument protocol followed is appropriate for the instrument being used.
- The Hach DR/2000 is designed to turn off after a few minutes of inactivity. Press the "READ/ENTER" key every few minutes to prevent DR/2000 from turning off. If DR/2000 turns off, use Reference cuvette to rezero. Newer DR/2000 models and the DR/2010 have an override "constant on" feature that allows the machine to run indefinitely. Refer to the Instrument Operation: Spectrophotometer Setup section of the HACH DR/2000 or DR/2010 User's manuals.

If you are using the TNT test in conjunction with the RDX test it is important to save your sample extracts. They will be used in the RDX test. Remember to cap the extracts tightly after use. An RDX kit without extraction set-ups can be purchased specifically for this purpose.

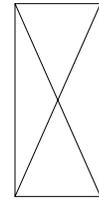
PHASE 1 TEST PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

CLEAN CUVETTES



- 1a Fill 2 Hach matched cuvettes with approximately 5 mL water.
- 1b Cap each with cuvette stopper plug and, holding plug in place, shake vigorously for 3 seconds.
- 1c Empty into waste container.
- 1d Fill cuvettes with approximately 5 mL acetone.
- 1e Cap each with cuvette stopper plug and, holding plug in place, shake vigorously for 3 seconds.
- 1f Empty into waste container.
- 1g Repeat acetone wash (steps 1d - 1f).
- 1h Wipe outside of cuvette with paper towels. Take care to especially clean the side labeled "25 mL" and the side opposite.



Cuvette



Cuvette stopper

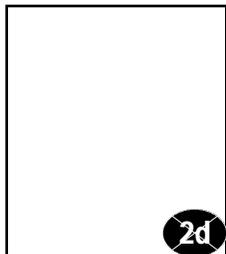
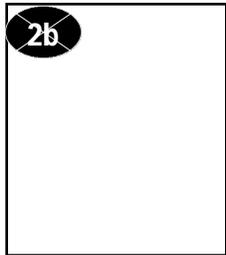
PHASE 1 TEST PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

READ BEFORE PROCEEDING

- Designate a “Reference” and “Sample” cuvette.

SPECTROPHOTOMETER PREPARATION



2a1 Turn on Hach **DR/2000**. The instrument will read “SELF-TEST” followed by “Method?”. Select Method “0” and press the “READ/ENTER” key.

or

2a2 Turn on the Hach **DR/2010**. The instrument will read “Self-Test V.xx”, then “Enter Program #”. Press the [Shift] key (do not hold) and then the [ABS/8] key. Note: Select Program # “0” may also be used to select absorbance mode on the **DR/2010**.

2b Rotate the wavelength dial until the small display shows: 540 nm.

2c Fill both cuvettes with acetone to the 25 mL line.

2d Insert “Reference” cuvette into cell holder on Hach **DR/2000** or **DR/2010** with side marked “25 mL” on the right.

2e1 Close light shield of the **DR/2000** and press “CLEAR/ZERO” key to establish the reference. The display will read “WAIT” and then “0.000 Abs.”.

or

2e2 Close the light shield of the **DR/2010** and press the [ZERO] key. The display will read “Zeroing...” then “0.000 Abs.”.

2f Remove the “Reference” cuvette and place the “Sample” cuvette in the cell holder.

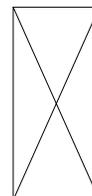
2g1 On the **DR/2000**, press the “READ/ENTER” key and record the absorbance on the worksheet as “Abs_{background}”.

or

2g2 On the **DR/2010**, press the [READ] key and record the absorbance on the worksheet as “Abs_{background}”.

2h If reading is greater than 0.002 in magnitude (+ or -), clean cuvettes and redo steps 2a - 2g.

2i Empty acetone from “Sample” cuvette into waste container.



Cuvette

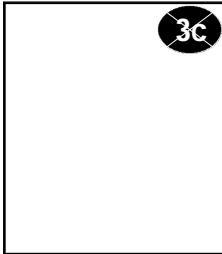
PHASE 2 SAMPLE EXTRACTION & PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

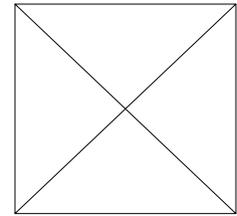
READ BEFORE PROCEEDING

- Sample should be mixed to ensure a homogeneous sample.

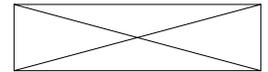
WEIGH SAMPLE



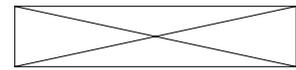
- 3a Place an unused weigh boat on pan balance.
- 3b Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
- 3c Weigh out 10+/- 0.1 grams of soil.
- 3d If balance turns off prior to completing weighing, use empty weigh boat to retare, then continue.



Weigh Boat



Pan balance

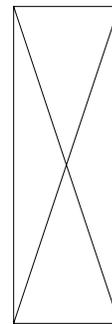


Wooden spatula

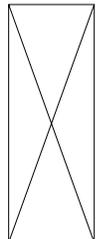
EXTRACT TNT



- 4a Measure 50 mL acetone in the 50mL graduated conical tube.
- 4b Pour acetone into an extraction jar.
- 4c Using wooden spatula, transfer 10 grams of soil from weigh boat into extraction jar.
- 4d Recap extraction jar tightly and shake vigorously for three minutes.
- 4e Allow to settle for five minutes.
Repeat steps 3a - 4e for each sample to be tested.

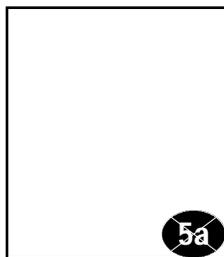


50mL
Graduated
Conical
Tube

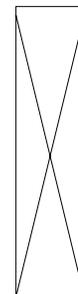


Extraction
jar

FILTER SAMPLE



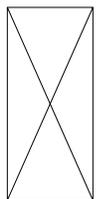
- 5a Place tip of 30 cc syringe into liquid above the sediment layer in the extraction jar and draw up 25 mL of the sample.
- 5b Screw the syringe filter onto the end of the syringe.
- 5c Press the plunger firmly and dispense the sample into the "Sample" cuvette.



30 cc
syringe



Syringe
filter

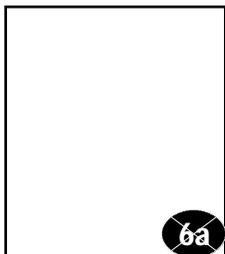


Cuvette

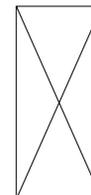
PHASE 3 SAMPLE ANALYSIS

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

READ SAMPLE



- 6a Place the “Sample” cuvette in the cell holder.
- 6b Press the “READ/ENTER” key and record the absorbance on the worksheet as “Abs_{initial}”.
- 6c Remove the “Sample” cuvette from the cell holder.
- 6d Add 1 drop of Developer Solution.
- 6e Cap the “Sample” cuvette and shake vigorously for 3 seconds.



Cuvette

DNT Analysis Note:

For analysis of samples containing DNT, and/or where DNT concentration is of concern, samples must be allowed to develop for 10 minutes before reading sample absorbance. This will not effect color development for other nitroaromatics.

- 6f Remove the cuvette stopper and place the “Sample” cuvette in the cell holder.
- 6g Press the “READ/ENTER” key and record the absorbance on the worksheet as “Abs_{sample}”.
- 6h Clean cuvette between samples using procedure in steps 1a - 1h.

PHASE 4 INTERPRETATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

INTERPRETATION OF RESULTS

- 7a** Multiply the “Abs_{initial}” value for each sample by 4. Enter these values on the worksheet.
- 7b** Subtract this value from the “Abs_{sample}” values for each sample and record on the worksheet.
- 7c** Divide the adjusted sample value by 0.0323 and record on the worksheet. This value is the TNT concentration of the sample in parts per million.

$$\text{TNT (ppm)} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323}$$

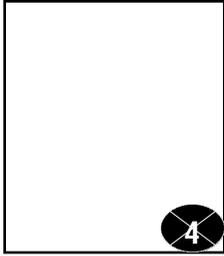
Note: For sample concentrations greater than 30ppm the sample extract should be diluted with acetone and reanalyzed. Remember to multiply the result by the dilution factor in order to determine the correct concentration.

CONTROL (QA/QC) CHECK

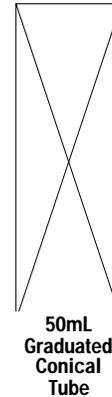
READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

- The TNT control is optional, but it is recommended that it be run daily.

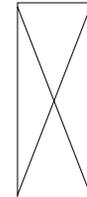
PREPARE CONTROL



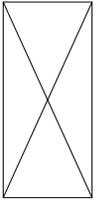
- 1 Measure 50 mL acetone in the 50mL graduated conical tube.
- 2 Pour into extraction jar.
- 3 Open TNT control ampule by slipping ampule cracker over top, and then breaking tip at scored neck.
- 4 Transfer entire contents of TNT control ampule into extraction jar using bulb pipette.
- 5 Cap extraction jar and shake vigorously for 3 seconds.



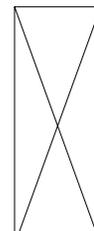
50mL
Graduated
Conical
Tube



TNT control



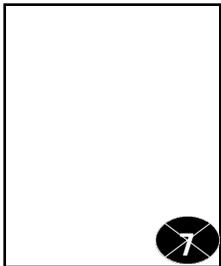
Ampule
cracker



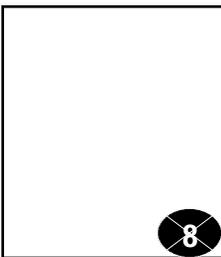
Extraction
jar

Bulb pipette

ANALYZE THE CONTROL



- 7 Place tip of 30 cc syringe in extraction jar and draw up 25 mL.
- 8 Attach syringe filter and dispense into "Sample" cuvette.
- 9 Add 1 drop of developer solution.
- 10 Cap the cuvette and shake vigorously for 3 seconds.
- 11 Remove the cuvette stopper and place in the cell holder.

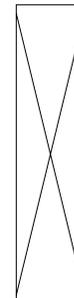


- 12 Press "READ/ENTER" key and record the absorbance on the worksheet as "Abs_{control}".

Absorbance must be between 0.307 - 0.373 for the test to be in control.

If test is not in control, clean "Sample" cuvette, and then redo steps 7-12 using the remaining liquid from the extraction jar.

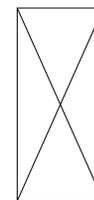
- 13 If test is in control clean "Sample" cuvette before proceeding with samples.



30 cc
syringe



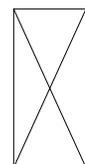
Syringe
filter



Cuvette



Cuvette
stopper



Developer
solution

QUALITY CONTROL

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

System Description

Each SDI EnSys® TNT Soil Test System contains enough material to perform twenty complete tests. The TNT Soil Test is divided into four phases. The instructions and notes should be reviewed before proceeding with the test.

Hotline Assistance

If you need assistance or are missing necessary Test System materials, call toll free: 1-800-544-8881.

Validation Information

Product claims are based on validation studies carried out under controlled conditions. Data has been collected in accordance with valid statistical methods and the product has undergone quality control tests of each manufactured lot.

Strategic Diagnostics Inc. does not guarantee that the results with the TNT Soil Test System will always agree with instrument-based analytical laboratory methods. All analytical methods, both field and laboratory, need to be subject to the appropriate quality control procedures.

How It Works

Controls, Samples, and color-change reagents are added to cuvettes. The concentration of TNT in an unknown **Sample** is determined by evaluating how much color is developed.

Quality Control

Standard precautions for maintaining quality control:

- ☒ Do not use reagents or components from one Test System with reagents or components from another Test System.
- ☒ Do not use the Test System after its expiration date.
- ☒ The sample must be analyzed immediately after adding the Developer Solution.
- ☒ Results may not be valid if DR/2000 reading for **Control** is outside of the range of 0.307 - 0.373.

Storage and Handling Precautions

- ☒ Wear protective gloves and eye wear.
- ☒ Store kit at room temperature and out of direct sunlight (less than 80°F).
- ☒ If acetone comes into contact with eyes, wash thoroughly with cold water and seek immediate medical attention.
- ☒ Operate test at temperatures greater than 4° C/40° F and less than 39° C/100° F.
- ☒ After use, dispose of kit components in accordance with applicable federal and local regulations.

ON-SITE QUALITY CONTROL/QUALITY ASSURANCE RECOMMENDATIONS SDI EnSys® TEST SYSTEM

Please read the following before proceeding with field testing.

SAMPLING

The result of your screening test is only as valid as the sample that was analyzed. Samples should be homogenized thoroughly to ensure that the 10 grams you remove for field testing is representative of the sample as a whole. All other applicable sample handling procedures should be followed as well.

PRIOR TO TESTING SAMPLES

Carefully follow the instructions in the User's Guide included with every test kit. This is the key element in obtaining accurate results. In addition, store your unused test kits at room temperature and do not use them past their expiration date (see label on each test kit).

INTERNAL TEST QC

One control is provided with each Kit to provide internal test system quality control. Test runs resulting in a number that falls outside of the specified range should be repeated to ensure valid conclusions.

QA/QC

The validity of field test results can be substantially enhanced by employing a modest, but effective QA/QC plan. SDI recommends that you structure your QA/QC plan with the elements detailed below. These have been developed based on the data quality principles established by the U.S. Environmental Protection Agency.

- A. **Sample Documentation**
 - 1. Location, depth
 - 2. Time and date of collection and field analysis
- B. **Field analysis documentation** - provide raw data, calibration, any calculations, and final results of field analysis for all samples screened (including QC samples)
- C. **Method calibration** - this is an integral part of SDI tests; a TNT control analysis should be performed daily (see the instructions in the User's Guide)
- D. **Method blank** - field analyze fresh acetone
- E. **Site-specific matrix background field analysis** - collect and field analyze uncontaminated sample from site matrix to document matrix effect
- F. **Duplicate sample field analysis** - field analyze duplicate sample to document method repeatability; at least one of every 20 samples should be analyzed in duplicate
- G. **Confirmation of field analysis** - provide confirmation of the quantitation of the analyte via an EPA-approved method different from the field method on at least 10% of the samples; provide chain of custody and documentation such as gas chromatograms, mass spectra, etc.
- H. **Performance evaluation sample field analysis (optional, but strongly recommended)** - field analyze performance evaluation sample daily to document method/operator performance
- I. **Matrix spike field analysis (optional)** - field analyze matrix spike to document matrix effect on analyte measurement

FURTHER QUESTIONS?

SDI's Technical Support personnel are always prepared to discuss your quality needs to help you meet your data quality objectives. Call 1-(800) 544-8881.

TNT SOIL TEST - ABBREVIATED PROCEDURE

STEP	P R O C E D U R E
1	<ul style="list-style-type: none"> • Clean cuvettes • Zero the spectrophotometer at 540 nm
2	<ul style="list-style-type: none"> • Add 10 g soil and 50 ml acetone to extraction jar • Shake 3 minutes, let settle • Draw up 25 mL extract, filter into cuvette
3	<ul style="list-style-type: none"> • Read Abs_{initial}, record • Add 1 drop developer solution, shake • Read Abs_{sample}, record
4	<ul style="list-style-type: none"> • Multiply Abs_{initial} by 4 • Subtract from Abs_{sample} • Divide by 0.0323 • $\text{TNT}_{(\text{ppm})} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323}$

Supplement to SDI EnSys[®] TNT Soil Test User' Guide for Use at Earth Tech Sampling Events at the Benicia Tourtelot Clean-Up Project (TCUP), Spring 2000

The purpose of this supplement is to make the SDI EnSys[®] TNT Soil Test Kit useable for the purpose of determining if TNT is present in soil samples at or above a level of 10% (100,000 ppm). **Samples exceeding 10% cannot and will not be shipped to the laboratory for further analysis.** The sensitivity of the kits is 1-30 ppm (0.0001% - 0.003%), therefore, the method in the User's Guide requires modification to serially dilute the samples for determination in the range of interest.

All steps presented in the User's Guide will be used, with the following modifications to the following steps:

3c. Weigh out 1.0 gram of soil as accurately as possible (within +/- 0.1g) [*replaces 10 g +/- 0.1g*]. Working range becomes 10-300 ppm. This step results in 10X multiplication of result utilizing worksheet formula in User's Guide. Proceed with steps 3d, 4a, and 4b.

4c. Proceed with step 4c, transferring the 1.0 g soil [*instead of 10 g*]. Proceed with steps 4d and 4e.

Add the following steps for accurate dilution of the extract:

4f. Using 1.0 mL graduated disposable plastic syringe [*instead of 30 cc filter syringe*], draw up 1.0 mL of the extract and quantitatively transfer to a clean sample extraction jar. Recap extraction jar tightly, and save in case further dilution is required. Discard disposable syringe. Using the 12 mL graduated disposable syringe transfer pipette (or use the 30 mL syringe pipette provided with the test kit for use in step 5a), pipette 24 mL of acetone (use twice) into the extraction jar. Swirl carefully, then proceed to step 5a of the User's Guide (try to draw up all 25 mL of the diluted extract) and proceed with analysis. Working range becomes 250-7500 ppm (0.025% - 0.75%). Use of this step and modified step 3c now results in 250X multiplication of result utilizing worksheet formula. Proceed with steps 5, 6, and 7.

7c. If sample result exceeds $30 \times 10 \times 25 = 7500$ ppm, further dilution will be required:

Start again with step 4f, removing 1.0 mL extract from original sample extraction jar. After swirling carefully, repeat step 4f a second time, drawing up 1.0 mL of the 25X diluted extract and quantitatively transfer to another clean sample extraction jar. Swirl carefully, then proceed to step 5a of the User's Guide (try to draw up all 25 mL of the final diluted extract) and proceed with analysis. Working range becomes 6250-187,500 ppm (0.625% - 18.75%). Use of this step and modified step 3c now results in 6250X multiplication of result utilizing worksheet formula.

If sample result exceeds 10% (100,000 ppm) or if absorbance exceeds scale after second dilution, the sample cannot be transported to the laboratory. Further dilution and analysis is not necessary. Record result and if result exceeds 18.75% (187,500 ppm) add "EXCEEDS ANALYTICAL RANGE" to numerical result from formula.

WORKSHEET**SAMPLE ID****Formulas:**

If using **unmodified** method in user's guide (10 g soil, no dilutions):

$$\text{TNT(ppm)} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323} \quad \text{TNT(ppm)} = \frac{-(\quad \times 4)}{0.0323} = \quad \text{ppm}$$

If using **modified step 3c** (1.0 g soil, no further dilution), above:

$$\text{TNT(ppm)} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323} \times 10$$

$$\text{TNT(ppm)} = \frac{-(\quad \times 4)}{0.0323} \times 10 = \quad \text{ppm} \div 10,000 = \quad \%$$

If using **modified steps 3c, 4c, and 4f** (1.0 g soil, one 25X dilution), above:

$$\text{TNT(ppm)} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323} \times 25$$

$$\text{TNT(ppm)} = \frac{-(\quad \times 4)}{0.0323} \times 250 = \quad \text{ppm} \div 10,000 = \quad \%$$

If using **modified steps 3c, 4c, 4f (twice), and 7c** (1.0 g soil, two 25X dilutions), above:

$$\text{TNT(ppm)} = \frac{\text{Abs}_{\text{sample}} - (\text{Abs}_{\text{initial}} \times 4)}{0.0323} \times 6250$$

$$\text{TNT(ppm)} = \frac{-(\quad \times 4)}{0.0323} \times 6250 = \quad \text{ppm} \div 10,000 = \quad \%$$

STRATEGIC DIAGNOSTICS INC.

RDX EnSys[®] SOIL TEST SYSTEM

70850/70851

RAPID FIELD SCREEN

User's Guide

IMPORTANT NOTICE

The range of the test is between 1 and 30 ppm RDX/HMX. The relative standard deviation is 10%. The least detectable concentration is 0.8 ppm (RDX).

This test system should be used only under the supervision of a technically qualified individual who is capable of understanding any potential health and environmental risks of this product as identified in the product literature. The components must only be used for the analysis of soil samples for the presence of RDX/HMX. After use, the kits must be disposed of in accordance with applicable federal and local regulations.

PHASE 1 TEST PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

ITEMS INCLUDED IN TEST KIT WITH EXTRACTION SET-UPS

- 2 Cuvette stopper plugs
- 1 Ampule Cracker
- 40 Syringe Filters
- 20 Wooden Spatulas
- 20 10cc Syringe
- 20 50mL Reaction Vials w/ H₂O
- 20 Extraction jars
- 1 Bulb Pipette
- 1 50mL Conical Tube
- 20 5cc Zinc syringes
- 20 13mL Tubes
- 20 Acetic Acid Bulb Pipets
- 1 RDX control ampule
- 20 30 cc Syringes
- 20 Weigh Boats
- 20 NitriVer Pillows

- Your kit will not contain wooden spatulas, extraction jars or weigh boats if it was purchased to use in conjunction with the TNT Soil Test.

ITEMS NOT INCLUDED IN TEST KIT

- 2 matched HACH cuvettes
- Paper towels
- Disposable gloves
- Acetone
- Calculator
- Scissors
- Waste container
- Hach DR/2000 or DR/2010
- Balance

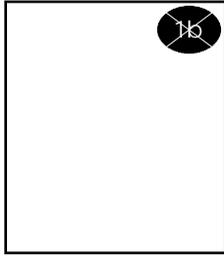
READ BEFORE PROCEEDING

- Recovery of the RDX from some soil samples is most consistent when the soil samples are air dried prior to extraction and testing.
- It is recommended that a control be run each day. See p.8 for instructions.
- **Nitrates and Nitrites cause false positive results with the RDX test. Therefore, it is necessary to evaluate the soil for these compounds prior to sample analysis. See p.9 for instructions.**
- SDI's EnSys® RDX Soil Test System is designed for use with either of Hach models **DR/2000** or the newer **DR/2010** spectrophotometers. Protocols for use of both instruments are provided in this User's Guide. Ensure the instrument protocol followed is appropriate for the instrument being used.
- The Hach **DR/2000** is designed to turn off after a few minutes of inactivity. Press the "READ/ENTER" key every few minutes to prevent **DR/2000** from turning off. If **DR/2000** turns off, use Reference cuvette to rezero. Newer **DR/2000** models and the **DR/2010** have an override "constant on" feature that allows the machine to run indefinitely. Refer to the Instrument Operation: Spectrophotometer Setup section of the HACH **DR/2000** or **DR/2010** User's manuals.
- **If you are using the RDX soil test kit in conjunction with the TNT soil test kit, the sample extract generated with the TNT test may be used for the RDX test. (Skip steps 2a - 3e of the RDX test if this scenario applies.) An RDX kit without extraction set-ups can be provided specifically for this purpose.**

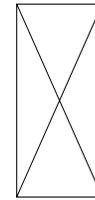
PHASE 1 TEST PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

CLEAN CUVETTES



- 1a** Fill 2 Hach matched cuvettes with approximately 5 mL water.
- 1b** Cap each with cuvette stopper plug and, holding plug in place, shake vigorously for 3 seconds
- 1c** Empty into waste container.
- 1d** Fill cuvettes with approximately 5 mL acetone.
- 1e** Cap each with cuvette stopper plug and, holding plug in place, shake vigorously for 3 seconds
- 1f** Empty into waste container.
- 1g** Repeat acetone wash(steps 1d - 1f).
- 1h** Wipe outside of cuvette with paper towels. Take care to especially clean the side labeled "25 mL" and the side opposite.



Cuvette



Cuvette stopper

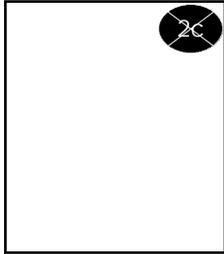
PHASE 2 SAMPLE EXTRACTION & PREPARATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

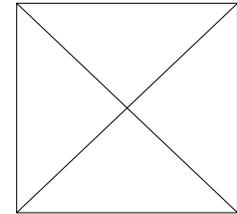
READ BEFORE PROCEEDING

- Sample should be mixed to ensure a homogeneous sample.

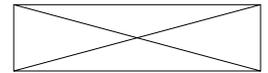
WEIGH SAMPLE



- 2a Place an unused weigh boat on pan balance.
- 2b Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
- 2c Weigh out 10+/-0.1 grams of soil.
- 2d If balance turns off prior to completing weighing, use empty weigh boat to retare, then continue.



Weigh Boat

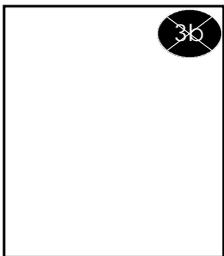


Pan balance

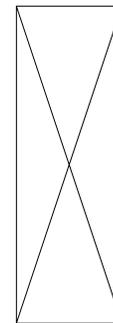


Wooden spatula

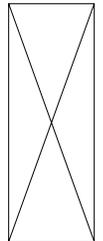
EXTRACT RDX



- 34a Measure 50mL acetone in the 50mL graduated conical tube.
- 3b Pour acetone into the extraction jar.
- 3c Using wooden spatula, transfer 10 grams of soil from weigh boat into extraction jar.
- 3d Recap extraction jar tightly and shake vigorously for three minutes.
- 3e Allow to settle for five minutes.



50mL
Conical
Tube



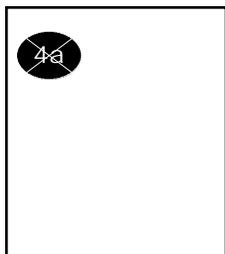
Extraction
jar

PHASE 3 SAMPLE ANALYSIS

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

If nitrates/nitrites are present, follow instruction in bold type, if not, ignore.

ANALYZE SAMPLE



4a Using the 10cc syringe slowly draw up exactly 5.5mL of sample extract being careful to exclude air bubbles. **(8-10mL if nitrate/nitrite interferences are present)**

4b **(If nitrate/ nitrite interferences are present, attach Alumina-A cartridge to syringe filter discarding single drops of filtrate into a waste container until 5 mL of extract remain. Dropwise, add the remaining 5 mL of filtrate to the 13 mL tube.)** Attach the syringe filter securely to the syringe and dispense into 13mL tube. Cut open tip of Acetic Acid bulb pipet and expel contents into 13mL tube. Cap & shake. Repeat steps **4a - 4b** for remaining samples.

4c Cut open one end of a NitrVer pillow and pour it into a 50mL Reaction Vial containing water. Prepare a vial for each sample. (Do not let the NitrVer powder/water solution stand longer than 10 minutes before adding sample.)

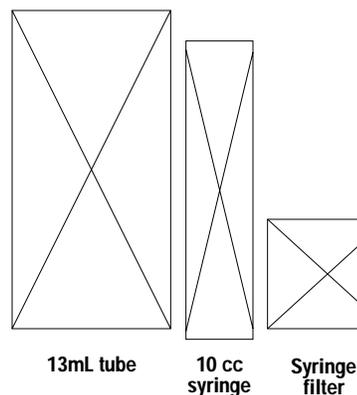
4d Remove plunger from 5cc zinc syringe and **quickly** pour the solution from the 13mL tube into the syringe barrel. Hold syringe over Reaction Vial as dripping will occur.

4e Replace the plunger & invert twice.

4f **Rapidly** filter the solution into the 50mL Reaction Vial. Cap and shake for 30 seconds. Repeat **4d - 4f** for remaining samples.

4g Allow this reaction to incubate for 15 minutes while color develops.

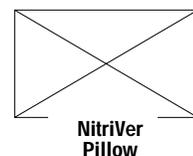
4h **Proceed to page 6 during incubation.**



13mL tube

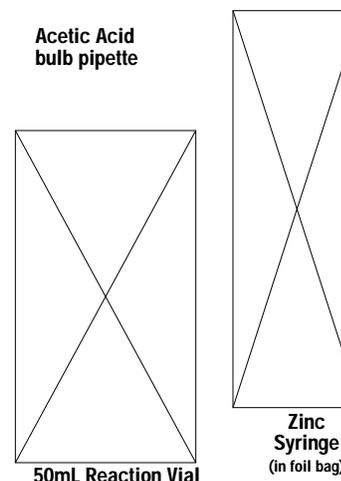
10 cc syringe

Syringe filter



NitrVer Pillow

Acetic Acid bulb pipette



50mL Reaction Vial

Zinc Syringe (in foil bag)

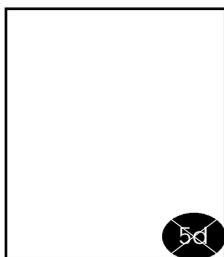
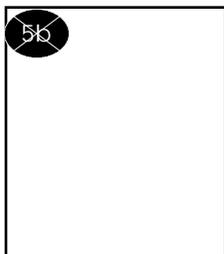
PHASE 4 INTERPRETATION

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

READ BEFORE PROCEEDING

- Designate a “Reference” and “Sample” cuvette.

SPECTROPHOTOMETER PREPARATION



5a1 Turn on Hach **DR/2000**. The instrument will read “SELF-TEST” followed by “Method?”. Select Method “0” and press the “READ/ENTER” key.

or

5a2 Turn on the Hach **DR/2010**. The instrument will read “Self-Test V.xx”, then “Enter Program #”. Press the [Shift] key (do not hold) and then the [ABS/8] key. Note: Select Program # “0” may also be used to select absorbance mode on the **DR/2010**.

5b Rotate the wavelength dial until the small display shows: 510 nm.

5c Fill both cuvettes with acetone to the 25 mL line.

5d Insert “Reference” cuvette into cell holder on Hach **DR/2000** or **DR/2010** with side marked “25 mL” on the right.

5e1 Close light shield of the **DR/2000** and press “CLEAR/ZERO” key to establish the reference. The display will read “WAIT” and then “0.000 Abs.”.

or

5e2 Close the light shield of the **DR/2010** and press the [ZERO] key. The display will read “Zeroing...” then “0.000 Abs.”.

5f Remove the “Reference” cuvette and place the “Sample” cuvette in the cell holder.

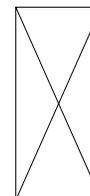
5g1 On the **DR/2000**, press the “READ/ENTER” key and record the absorbance on the worksheet as “Abs_{background}”.

or

5g2 On the **DR/2010**, press the [READ] key and record the absorbance on the worksheet as “Abs_{background}”.

5h If reading is greater than 0.002 in magnitude (+ or -), clean cuvettes and redo steps 2a - 2g.

5i Empty acetone from “Sample” cuvette into waste container



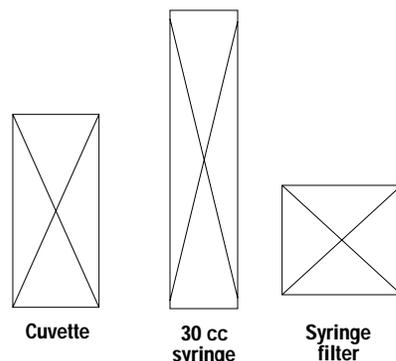
Cuvette

PHASE 4 INTERPRETATION

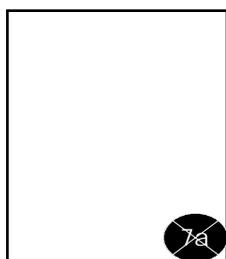
READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

FILTER SAMPLE

- 6a Disassemble a 30cc syringe and attach a syringe filter.
- 6b After incubation, shake reacted sample vigorously and pour into barrel of 30cc syringe. Insert plunger. Press firmly and expel total contents into the HACH cuvette.



READ SAMPLE



- 7a Place the "Sample" cuvette in the cell holder.
- 7b1 On the **DR/2000**, press the "READ/ENTER" key and record the absorbance on the worksheet.
or
- 7b2 On the **DR/2010**, press the [READ] key and record the absorbance on the worksheet.
- 7c Clean cuvette between samples using procedure in steps 1a - 1h.

INTERPRETATION OF RESULTS

- 8a Subtract 0.014 value from the sample absorbance values
- 8b Divide this value by 0.0225 and record on the worksheet. This value is the RDX concentration of the sample in parts per million.

$$[\text{RDX}] (\text{ppm}) = \frac{\text{Abs} - 0.014}{0.0225}$$

Note: For sample concentrations greater than 30ppm the sample extract should be diluted with acetone and reanalyzed.

Remember to multiply the result by the dilution factor in order to determine the correct concentration.

Minimum Detection Levels

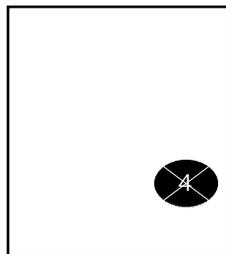
RDX	0.8 ppm
HMX	2.4 ppm
PETN	1.0 ppm
Nitroglycerine	8.9 ppm
Nitroguanadine	10.1 ppm
Nitrocellulose	42.2 ppm

CONTROL (QA/QC) CHECK

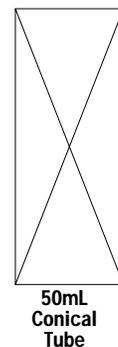
READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

- The RDX control is optional but it is recommended that it be run daily.

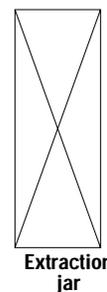
PREPARE CONTROL



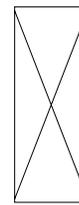
- 1 Measure 50 mL acetone in a graduated 50mL conical tube.
- 2 Pour into extraction jar.
- 3 Open RDX control ampule by slipping ampule cracker over top, and then breaking tip at scored neck.
- 4 Transfer entire contents of RDX control ampule into extraction jar using empty bulb pipette.
- 5 Cap extraction jar and shake.



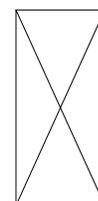
50mL
Conical
Tube



Extraction
jar



RDX



Ampule
cracker

ANALYZE THE CONTROL

Repeat steps 4a - 7c on pages 5 - 7

Record the absorbance on the worksheet as " $Abs_{control}$ ".

Absorbance must be between 0.174 - 0.274 for the test to be in control.

If test is not in control, clean "Sample" cuvette, and then redo steps 4a- 7c using the remaining liquid in the extraction jar.

If test is in control clean "Sample" cuvette before proceeding with samples.

If kept tightly capped, the control can be used again for additional QC runs.

Bulb pipette

BACKGROUND - NITRATE/NITRITES TEST

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

- **Site representative samples must be run prior to analysis for RDX to ensure that Nitrate/Nitrite interferents (i.e., fertilizers, degraded explosives, etc.) are not present. Please call Technical Services at (800)544-8881.**
- These interferents cause a color reaction with the test identical to RDX and will lead to false positives.
- If Nitrates/Nitrites are present, Alumina-A cartridges must be utilized (refer to step 4b). These will quickly and easily remove the interferents from the soil extract during the extra filtration steps.

(Alumina-A cartridges suitable for this application are available from Alltech Associates, Inc. 2051 Waukegan Road, Deerfield, IL 60015, Part # 210094 (300 mg./25 pk.), Phone: (800)255-8324 & (847)948-8600, Fax: (847)948-1078.)

READ BEFORE PROCEEDING

- Sample should be mixed to ensure a homogeneous sample.

1) Repeat steps 2a - 4c on page 4 & 5.

2) **Omit steps 4d - 4e***

* Zinc syringe is not used when testing for Nitrates/Nitrites.

3) Proceed with steps 4f - 7c

Record the absorbance on the worksheet as "Abs Nitrate/Nitrite".

If the absorbance is <0.05 , the samples are free of Nitrates/Nitrites and the samples can be tested.

If absorbance is > 0.05 , then Alumina-A cartridges must be utilized to remove nitrate/nitrite interferents.

QUALITY CONTROL

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

System Description

Each SDI EnSys® RDX Soil Test System contains enough material to perform twenty complete tests. The RDX Soil Test is divided into four phases. The instructions and notes should be reviewed before proceeding with the test.

Hotline Assistance

If you need assistance or are missing necessary Test System materials, call toll free: 1-800-544-8881.

Validation and Warranty Information

Product claims are based on validation studies carried out under controlled conditions. Data has been collected in accordance with valid statistical methods and the product has undergone quality control tests of each manufactured lot.

Strategic Diagnostics Inc. does not guarantee that the results with the RDX Soil Test System will always agree with instrument-based analytical laboratory methods. All analytical methods, both field and laboratory, need to be subject to the appropriate quality control procedures.

How It Works

Controls, Samples, and color-change reagents are added to cuvettes. The concentration of **RDX** in an unknown **Sample** is determined by evaluating how much color is developed.

Quality Control

Standard precautions for maintaining quality control:

- ☒ Do not use reagents or components from one Test System with reagents or components from another Test System.
- ☒ Do not use the Test System after its expiration date.
- ☒ The sample must be analyzed within 60 minutes of the color incubation step.
- ☒ Results may not be valid if DR/2000 or DR/2010 reading for **Control** is outside of the range of 0.174 - 0.274.

Storage and Handling Precautions

- ☒ Wear protective gloves and eye wear.
- ☒ Store kit at room temperature and out of direct sunlight (less than 80°F).
- ☒ If acetone comes into contact with eyes, wash thoroughly with cold water and seek immediate medical attention.
- ☒ Operate test at temperatures greater than 4° C/40° F and less than 39° C/100° F.
- ☒ After use, dispose of kit components in accordance with applicable federal and local regulations.

ON-SITE QUALITY CONTROL/QUALITY ASSURANCE RECOMMENDATIONS SDI EnSys® TEST SYSTEM

Please read the following before proceeding with field testing.

SAMPLING

The result of your screening test is only as valid as the sample that was analyzed. Samples should be homogenized thoroughly to ensure that the 10 grams you remove for field testing is representative of the sample as a whole. All other applicable sample handling procedures should be followed as well.

PRIOR TO TESTING SAMPLES

Carefully follow the instructions in the User's Guide included with every test kit. This is the key element in obtaining accurate results. In addition, store your unused test kits at room temperature and do not use them past their expiration date (see label on each test kit).

INTERNAL TEST QC

One control is provided with each Kit to provide internal test system quality control. Test runs resulting in a number that falls outside of the specified range should be repeated to ensure valid conclusions.

QA/QC

The validity of field test results can be substantially enhanced by employing a modest, but effective QA/QC plan. SDI recommends that you structure your QA/QC plan with the elements detailed below. These have been developed based on the data quality principles established by the U.S. Environmental Protection Agency.

- A. **Sample Documentation**
 - 1. Location, depth
 - 2. Time and date of collection and field analysis
- B. **Field analysis documentation** - provide raw data, calibration, any calculations, and final results of field analysis for all samples screened (including QC samples)
- C. **Method calibration** - this is an integral part of SDI tests; an RDX control analysis should be performed daily (see the instructions in the User's Guide)
- D. **Method blank** - field analyze fresh acetone
- E. **Site-specific matrix background field analysis** - collect and field analyze uncontaminated sample from site matrix to document matrix effect
- F. **Duplicate sample field analysis** - field analyze duplicate sample to document method repeatability; at least one of every 20 samples should be analyzed in duplicate
- G. **Confirmation of field analysis** - provide confirmation of the quantitation of the analyte via an EPA-approved method different from the field method on at least 10% of the samples; provide chain of custody and documentation such as gas chromatograms, mass spectra, etc.
- H. **Performance evaluation sample field analysis (optional, but strongly recommended)** - field analyze performance evaluation sample daily to document method/operator performance
- I. **Matrix spike field analysis (optional)** - field analyze matrix spike to document matrix effect on analyte measurement
- J. **Nitrate/Nitrite test** - this is an integral part of the SDI EnSys® RDX Test; it should be performed at least once for each site.

FURTHER QUESTIONS?

SDI's Technical Support personnel are always prepared to discuss your quality needs to help you meet your data quality objectives. (800)-544-8881

RDX Soil Test - Abbreviated Procedure

STEP	P R O C E D U R E
1	<ul style="list-style-type: none"> • Clean cuvettes • Zero the spectrophotometer at 510 nm
2	<ul style="list-style-type: none"> • Add 10 g soil and 50mL acetone to extraction jar • Shake 3 min., let settle
3	<ul style="list-style-type: none"> • Draw up 5.5 mL extract, filter into 13 mL tube (If NO3/NO2 contaminants present: 8-10 mL of extract, filtered slowly through Alumina-A cartridge) • Open bulb pipet, add Acetic Acid to 13 mL tube, mix • Add NitrVer to 50 mL Reaction Vial • Pour from 13 mL Tube into zinc syringe • Invert 2X and filter into 50 mL Reaction Vial • Shake 30 seconds • Incubate 15 minutes
4	<ul style="list-style-type: none"> • Read Abs at 510 • Calculate RDX concentration • $[RDX]ppm = (Abs - 0.014) / 0.0225$

ATTACHMENT 3
CHAIN OF CUSTODY

Appendix B

APPENDIX B

TECHNICAL PROJECT PLANNING MEETING NOTES



Technical Project Planning Meeting
 Military Munitions Response Program
 United States Army
 Upper Burning Ground, Sierra Army Depot

15 November 2006

Project: Military Munitions Response Program Site Inspection,
 Sierra Army Depot,

Points of Contact: USAEC Program Manager: Mary Ellen Maly/410-436-1511
 USACE, SPK Project Manager: Young Chong/916-557-7212
 Contractor, TLI Solutions Project Manager: Gene Barber/303-763-7188

A Technical Project Planning (TPP) meeting for the Site Inspection (SI) of the Sierra Army Depot (SIAD) was held on 15 November 2006, at the Skedaddle Inn, Herlong, California.

MEETING ATTENDEES

Name	Organization/Title	Email	Telephone Number
Susan Holliday	SIAD, Installation Restoration Program Manager	susan.holliday@sierra.army.mil	530-827-4205
David Holsey	SIAD	david.holsey@sierra.army.mil	530-827-4381
Bill Bahl	SIAD, Strategy Planner	William.bahl@us.army.mil	530-827-4277
Chris Graves	SIAD, Directorate, Risk Management	Chris.graves@us.army.mil	530-827-9466
Bruce Hamilton	SIAD, Garrison Manager	Bruce.a.hamilton@us.army.mil	530-827-4400
Joe King	USAEC	Joseph.king5@us.army.mil	410-436-1613
Young Chong	USACE – SPK/Project Manager	young.s.chong@usace.army.mil	916-557-7212
Lorraine Larsen-Hallock	DTSC	llarsenh@dtsc.ca.gov	916-255-3578
Jim Austreng	DTSC	jaustreng@dtsc.ca.gov	916-255-3702
Francesca D’Onofrio	DTSC	fdonofir@dtsc.ca.gov	916-255-3603
Ralph Brooks	Tetra Tech NUS/UXO Manager	Ralf.brooks@ttnus.com	770-413-0965
Ralph Basinski	Tetra Tech NUS	Ralfph.sasinski@ttnus.com	412-921-8308
Kirk Bausman	SIAD, Chief Ammunition Div	Kirk.bausman@us.army.mil	530-827-4213
Larry Gallego	SIAD, Explosive Safety Project Manager	Lorenzo.gallegojr@us.army.mil	530-827-4405
Tom Skang	DTSC	Tskang@dtsc.ca.gov	916-255-6524



DEPARTMENT OF THE ARMY
UNITED STATES ARMY ENVIRONMENTAL CENTER
SIERRA ARMY DEPOT
UNITED STATES ARMY CORPS OF ENGINEERS



Tim Wakefield	Bureau of Land Management	timothy_wakefield@blm.gov	530-252-5322
Paul Carpenter	DTSC	pcartpenter@dtsc.ca.gov	916-255-6534
Gene Barber	TLI, Project Manager	gbarber@tlisolutions.com	303-763-7188
Cheryl Mahoney	TLI, Technical Team Lead	cmahoney@tlisolutions.com	916-557-7819
Dave Ahlborn	Earth Tech, Project Manager	david.ahlborn@earthtech.com	909-554-5063

Representatives from the organizations listed above met at the Skedaddle Inn, Herlong, California, located just outside the gates of Sierra Army Depot (SIAD), on 15 November 2006 at 1:00 p.m. Tetra Tech personnel were present to facilitate coordination between the Closure Plan for the RCRA sites and the Military Munitions Response Program (MMRP) Site Inspection.

In order to fill in the Stakeholders new to the program, Mr. Gene Barber provided a brief overview of the Active Army MMRP. It was noted that the SI for the MMRP sites typically follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. However, the SI for the Upper Burning Ground will follow the Resource Conservation and Recovery Act (RCRA) process. Mr. Barber further explained that the Phase 3 Army Range Inventory resulted in identifying closed, transferred, and transferring (CTT) defense sites known or suspected of containing unexploded ordnance (UXO), discarded military munitions (DMM), and/or munitions constituents (MC) (i.e., MMRP sites) at SIAD. The Upper Burning Ground (UBG) was not originally included as an MMRP site. It was added later, after the RCRA site boundaries were clearly defined. Mr. Barber then discussed the site prioritization protocol and funding issues, and the goals of the MMRP Site Inspection. An explanation of the TPP process was also presented.

Ms. Mahoney presented information regarding the history of the Upper Burning Ground as detailed in the Historical Records Review (HRR) report. There are three MMRP sites, the UBG, the BLM-Administered Public Lands, and the Gravel Pit (Stacy). It was noted that there are several known operational areas located within the UBG that have previously been investigated under the Installation Restoration Program (IRP). The investigations at three of these areas were comprehensive and those sites are ineligible for the MMRP. There are two RCRA sites within the boundary of the UBG, which are also ineligible for the MMRP.

There are two areas near the UBG that require additional information before a determination can be made as to whether or not they qualify for the MMRP. The sites were identified as disturbed areas in historical aerial photographs, but it is unclear if this was a result of military or mining activity.

Mr. Dave Ahlborn presented the team's proposed plans for field work at the sites. The planned approach for sampling, visual surveys, and geophysical surveys at the sites was discussed. As part of the discussion regarding the visual survey, it was noted that the SI



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projects are not scoped to conduct calibration/seeding on the equipment. A basic test of the equipment is performed each day during field activities.

There were several topics discussed during the presentation, as well as during the open discussion following the presentations. These items are presented below.

It was noted that the BLM does not consider the previous clearance at the BLM site to be sufficient. The question was raised as to what requirements would need to be met in order for the BLM to accept the property. There was also discussion regarding the transfer of this property back to DoD. It was noted that there had been a request to transfer the property to DoD, but that the request was denied by Headquarters. This item will require more discussion at another time.

There are currently ten people at SIAD that operated as “destroyers” at the UBG and are familiar with historic activities at the site. It was suggested that they work in the field with the SI field teams. Ms. Chong stated that she would meet with Ms. Holliday after the meeting to discuss this. It may be possible for the USACE to MIPR funds to SIAD in order for these individuals to assist the field teams.

Tetra Tech is working on the Closure Plan for the RCRA sites. They are developing QA/QC protocols. The areas within the RCRA boundaries will be addressed by the Closure Plan, while the areas outside the boundaries will be addressed as a RCRA corrective action. There are some differences between the requirements for CERCLA and RCRA, including sampling protocol. DTSC requested copies of the TLI and laboratory SOPs and SOWs to see if they meet the RCRA requirements. It was noted that the sampling protocol is provided in the draft Work Plan and it was requested that DTSC review the sampling protocol provided in the original SIAD Work Plan to see if this approach would be sufficient. It was agreed that Earth Tech would obtain the SOPs from the laboratory and provide those to DTSC for review. They will also be provided in the UBG Draft Work Plan. The laboratories used are both USACE and California certified.

There was some discussion regarding the use of PRGs for screening purposes and whether this would meet RCRA requirements. Ms. Larsen-Hallock stated that PRGs are not the criteria under RCRA, they use Health Based Risk Levels. However, it was decided that it would be acceptable to use PRGs for screening purposes at the SI level of investigation and, where relevant, include background levels as provided in previous SIAD investigations. However, it was noted that PRGs could not be used for a determination of No Further Action (NFA), only as a qualitative assessment relative to the prioritization or concentration of RI level work.

During the presentation of the list of metals typically analyzed during the MMRP SIs, Mr. Barber noted that USAEC has proposed limiting metals analysis to those known to be associated with ordnance used at the site. This was done for the sites on the main depot. The issue of adding the analysis of tungsten and white phosphorous was discussed. There is no record that munitions containing tungsten were ever used at the



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site, so it will not be added. It was noted that samples are not typically analyzed for white phosphorous as it will ignite when exposed to air. It was determined that phosphate will be added to the list of metals and sodium will be deleted. Those present were in agreement with the modified list.

The question of acceptable criteria and Data Quality Objectives (DQOs) required for a finding of NFA was raised. Ms. Larsen-Hallock stated that DTSC would review the documents and develop the criteria for a NFA recommendation. There are probably not many areas at the UBG that would qualify for NFA, but there may be some in the northwestern corner. This information will be provided to TLI on 6 December 2007. [After the meeting, Ms. Larsen-Hallock provided the following information. The determination of NFA criteria will require detail review at the time of the initial Upper Burning Ground draft SI and could not be determined based on the main base final SI. The discussion at that time will need to include DTSC support staff review including a toxicologist. The action item to be completed by December, 6, 2006 was the discussion with DTSC legal staff to determine process and insure the Closure Plan Documents could simply make reference to the MMRP documents where corrective action is concerned.]

It was requested that a copy of the Draft Work Plan be sent to Mr. Ralph Basinski at Tetra Tech. Mr. Basinski is drafting the Closure Plan and this will help him to better coordinate the plan with the SI work plan. The Draft Closure Plan is scheduled for 15 January 2007. The Closure Plan was initially intended to address the kick-out area surrounding the RCRA sites, but as this will be covered by the SI Work Plan, the area will be separated and the Closure Plan will reference the SI Work Plan. Ms. Holliday and Ms. Larsen-Hallock will talk to legal to determine the best mechanism for addressing the kick-out area.

Mr. Bausman stated that the disturbed area east of the Demolition Area RCRA site that is visible in the aerial displayed during the presentation is approximately where they found some of the bomblets on the BLM property. They were not able to search the entire area because of the steep terrain. It was noted that the fence has fallen down in areas along the northern boundary. The Army originally had a firing limit of 10,000 pounds of net explosives in the Demolition Area. However, after the incident with the bomblets on the BLM property, they reduced the amount to lessen the distance of the kick-out. It was also noted that rattlesnakes are prevalent in the area and the field teams should be prepared.

There is a question regarding the ownership of the property on the western edge of the UBG. It has been listed as SIAD property, and is depicted that way on USGS topographic maps, but it may actually be owned by BLM. Additional research is required to address this.

Mr. Larry Gallego is the person to contact regarding security at the UBG and access to the site. Currently, SIAD contacts Moffett Field if EOD assistance is needed; however, EOD will be moving and no longer available. They can contact Fallon Naval Air Force Station, but then there is a fee for EOD services from Fallon.



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Ms. Holliday asked how DTSC would like any UXO finds to be addressed. Ms. Larsen-Hallock stated that if it is covered in the ROD, then that should be followed. It is unclear if the area outside the entire UBG is covered in the ROD or RAP, or if other guidance is necessary. Ms. Holliday will check to see if the area is covered. If it is not, she will check with DTSC for guidance. It was determined that DTSC should be contacted when UXO items are found. Mr. Holsey is the contact for SIAD when items are located. It was explained that a daily verbal report of field activities will be provided to SIAD during field activities.

Ms. Holliday stated that the SIAD Public Affairs Officer is working with USAEC to determine the best approach for contacting the owner of the Gravel Pit (Stacy) site. Ms. Holliday will contact TLI once a plan is created. The Right-of-Entry will be written by the USACE.

Mr. Tim Wakefield stated that he is the one to contact with a letter of request for entry onto the BLM property.

ACTION ITEMS

MMRP coordination required the following action items:

Item	Responsible Party	Due Date
Lab SOPs to DTSC	Dave Ahlborn	As soon as possible
Copy of Draft UBG Work Plan to Ralph at Tetra Tech	TLI Solutions	As soon as possible
Criteria/DQOs for NFA and requirements for SI Work Plan	DTSC	Received December 13, 2006 [see notes above]
Determine ownership of western section of the UBG	TLI with SIAD and BLM	As soon as possible
Discussion with legal to determine the best mechanism for addressing the kick-out area.	Ms. Holliday and Ms. Larsen-Hallock	Completed
Determine BLM's criteria for accepting the BLM property as cleared	BLM	As soon as possible
Contact owner of the Gravel Pit (Stacy) site	SIAD	Completed
Review ROD/RAP to see if they provide guidance for addressing UXO finds during field activity	SIAD	As soon as possible

As required by the USACE Technical Project Planning process, the following is a list of stakeholders who were invited, but were unable, to attend this meeting:

- Mary Ellen Maly, USAEC
- Charlie Ridenour, DTSC
- Jeff Fontana, BLM

Appendix C

**APPENDIX C
FINAL ACCIDENT PREVENTION PLAN**

**SITE INSPECTION
UPPER BURNING GROUND, SIERRA ARMY DEPOT
HERLONG, CALIFORNIA**

**ARMY RANGE INVENTORY AND SITE INVESTIGATION
PACIFIC OCEAN DIVISION (POD) AND SOUTH PACIFIC DIVISION (SPD)
USACE – SACRAMENTO DISTRICT**

Contract Number: W91238-05-F-0153

Prepared For:

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April 2007

FINAL
ACCIDENT PREVENTION PLAN
UPPER BURNING GROUND, SIERRA ARMY DEPOT,
HERLONG, CALIFORNIA

ARMY RANGE INVENTORY AND SITE INVESTIGATION
PACIFIC OCEAN DIVISION (POD) AND SOUTH PACIFIC DIVISION (SPD)
WESTERN REGION OF UNITED STATES
USACE – SACRAMENTO DISTRICT

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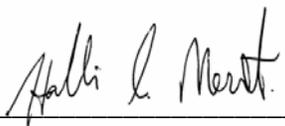
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Date

Ms. Holli L. Merchant, Certified Industrial Hygienist
Braun Safety Associates, LLC

FINAL
ACCIDENT PREVENTION PLAN
UPPER BURNING GROUND, SIERRA ARMY DEPOT,
HERLONG CALIFORNIA

ARMY RANGE INVENTORY AND SITE INVESTIGATION
PACIFIC OCEAN DIVISION (POD) AND SOUTH PACIFIC DIVISION (SPD)
WESTERN REGION OF UNITED STATES
USACE – SACRAMENTO DISTRICT

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- Attachment 1: Chemical Hazards Associated with UXO/MEC
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- Attachment 3: Certificate of Hazard Assessment
- Attachment 4: Documentation of PPE Training Form

ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
ALARA	As Low as Reasonably Achievable
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BBP	Blood-Borne Pathogen
BLM	Bureau of Land Management
°C	Degrees Celsius
CEHNC	Corps of Engineers – Huntsville Center
CESPK-SO	Chief, U.S. Army Corps of Engineers – Sacramento, Safety and Occupational Health Office
CHEMTREC	Chemical Transportation Emergency Center
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	Cardiopulmonary Resuscitation
CSHP	Corporate Safety and Health Program
CSP	Certified Safety Professional
CWM	Chemical Warfare Materiel
DDESB	Department of Defense Explosive Safety Board
DID	Data Item Description
DoD	Department of Defense
DMM	Discarded Military Munitions
EAP	Employee Assistance Program
EM	Electromagnetic
EMR	Experience Modification Rate
EMT	Emergency Medical Technician
ENG	Engineer
EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
°F	Degrees Fahrenheit
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GPS	Global Positioning System
HAZ-MAT	Hazardous Materials
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBV	Hepatitis B Virus
HIV	Human Immune deficiency Virus
HTRW	Hazardous, Toxic, and Radiological Waste
IRP	Installation Restoration Program
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MM	Military Munitions
MMRP	Military Munitions Response Program
MPH	Miles Per Hour

ACRONYMS AND ABBREVIATIONS (Concluded)

MR	Munitions Response
MSD	Minimum Separation Distance
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OE	Ordnance and Explosives
OSHA	Occupational Safety and Health Administration
OZ	Operational Zone
PCP	Methadone Opiates Phencyclidine
PEL	Permissible Exposure Limit
PM	Project Manager
POC	Point of Contact
POD	Pacific Ocean Division
PPE	Personal Protective Equipment
RDX	Cyclotrimethylenetrinitramine
REL	Recommended Exposure Limit
SI	Site Inspection
SOW	Scope of Work
SPD	South Pacific Division
SSO	Site Safety Officer
SUXOS	Senior Unexploded Ordnance Supervisor
SZ	Support Zone
SIAD	Sierra Army Depot
TLI	TLI Solutions, Inc.
TLV	Threshold Limit Values
TNT	Trinitrotoluene
TP	Technical Paper
UBG	Upper Burning Ground
USACE	United States Army Corps of Engineers
USAESCH	United States Army Engineering and Support Center: Huntsville
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
UXO	Unexploded Ordnance
UXOSO	Unexploded Ordnance Safety Officer
WBGT	Wet-Bulb, Globe Temperature

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – All locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance. It may also include explosive ordnance that has become hazardous by damage or deterioration.

Explosives Safety – A condition where operational capability and readiness, personnel, property, and the environment are protected from the unacceptable effects of an ammunition or explosives mishap.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Munitions Constituents (MC) – Any materials originating from unexploded ordnance, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means unexploded ordnance, DMM or munitions constituents (e.g., Trinitrotoluene [TNT] Cyclotrimethylenetrinitramine [RDX]) present in high enough concentrations to pose an explosive hazard.

Military Munitions (MM) – All ammunition products and components produced or used by or for the DoD or the U.S. Armed Services for national defense and security, including MM under the control of the DoD, the U.S. Coast Guard, the U.S. Department of Energy

(USDOE), and National Guard personnel. The term military munitions includes: confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries used by DOD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. MM do not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components thereof. However, the term does include non-nuclear components of nuclear devices, managed under DOE nuclear weapons program, after all required sanitation operations under the Atomic Energy Act of 1954, as amended, have been completed.

Operational Range – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities, or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

Range – A designated land or water area set aside, managed, and used for range activities of the DoD. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access and exclusionary areas, and airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration.

Transferred Range – A range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An active range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.

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1.0 BACKGROUND INFORMATION

TLI Solutions, Inc. of Golden, Colorado (TLI Solutions, a subsidiary of TLI Holdings Corporation) was issued Contract Number W91238-05-F-0153, Modification No. 2, which includes the performance of a Site Inspection (SI) at the Upper Burning Ground, Sierra Army Depot, Herlong California in support of the Military Munitions Response Program (MMRP). SI fieldwork is tentatively scheduled for July 16, 2007. This Accident Prevention Plan (APP) is Appendix C of the Site Inspection Work Plan for the Upper Burning Ground, Sierra Army Depot; details of the planned fieldwork are presented in the Work Plan and in the Generic Site Inspection Work Plan, dated October 2004 (revised July 2006). The scope of this effort includes visual surveys, sampling of surface soils for Munitions Constituents (MC), and a limited geophysical investigation. TLI Solutions has subsequently contracted Earth Tech, Inc. (Earth Tech) to conduct the field activities. For this project, TLI Solutions will provide the Unexploded Ordnance Safety Officer (UXOSO), field oversight, and project management. Earth Tech will provide the Senior Unexploded Ordnance Supervisor (SUXOS) and all operational positions.

The overall objectives of this task order are to perform a SI for potential Munitions and Explosives of Concern (MEC) and MC and to provide a site-specific final report for the Munitions Response (MR) sites associated with Sierra Army Depot. There are three MR sites associated with the Upper Burning Ground (UBG), Sierra Army Depot. One of the MR sites comprises the UBG, with the exception of the two RCRA areas and three areas which were addressed under the IRP, and two MR sites are located off the Sierra Army Depot Installation, the Bureau of Land Management (BLM) Administered Public Land site and the Gravel Pit (Stacy) site. Refer to Section 2.0 and Figure 2 of the Work Plan for a description of the MR sites.

TLI Solutions has prepared this APP to address all on-site work performed by TLI Solutions and its subcontractors. The purpose of the APP is to describe protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed at this site. The APP addresses site-specific safety and health requirements and procedures based upon known site-specific conditions and hazards.

A copy of the APP will be available on the project site for the duration of site operations. The APP will be enforced on-site by the UXOSO, the SUXOS, and the project managers. Any incident of threats to worker health and safety, or the potential for environmental impacts, will result in the immediate implementation of corrective actions by the UXOSO and site managers to protect the workers and the environment.

This APP was developed in accordance with the requirements of *29 Code of Federal Regulations (CFR) 1910; CFR 1926; ER 385-1-92(USACE Engineering Requirement, Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities); EM385-1-1 (USACE Safety and Health Requirements);* any other applicable federal state, and local safety and occupational health laws and regulations; and the TLI Solutions Corporate Safety and Health Program (CSHP).

Based on TLI Holdings Occupational Safety and Health Administration (OSHA) Form 300A for fiscal year (FY) 2004, the company did not experience any recordable injuries during the year. The average number of employees was 32 at the company's office in Golden, Colorado and these employees accounted for approximately 61,327 total work hours without a single day of work missed as the result of a work-related injury. For the entire TLI Holdings Corporation, four reportable cases of injuries were reported in FY 2005 resulting in a total of two-day loss of work. Following is a summary of TLI Holdings' Experience Modification Rate (EMR) for the past four years:

Table 1: TLI Holdings' EMR

<u>Fiscal Year</u>	<u>EMR</u>
2002	.80
2003	.85
2004	.91
2005	.78

TLI Holdings' EMR indicates that its losses due to worker's compensation claims are less than the average for its industry.

The hazard analyses performed for this project include the following activities and are presented below and in the noted tables in Section 11 of this APP:

- Table 3: Project Activity Hazard Analysis
- Table 4: Location, Survey, and Mapping Operations
- Table 5: Performing Unexploded Ordnance (UXO)/MEC Inspection Activities
- Table 6: Performing Quality Control Activities
- Table 7: Performing Motor Vehicle Operations
- Table 8: Operating Geophysical Instruments
- Table 9: Avoiding UXO/MEC at Sample Locations
- Table 10: Performing Sampling and Analysis Activities

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

TLI Solutions believes strongly that our people are the company's most important and valuable asset. The actions of the personnel, working together as a team, ultimately determine the success of the endeavors of the company.

Accidental injuries and illnesses can cause needless pain and suffering of employees and their families, as well as increasing costs and decreasing productivity and morale among employees. TLI Solutions is committed to providing a safe and healthful work environment for all of our employees in all locations. TLI Solutions ultimate goal is an accident-free work environment. TLI Solutions is committed to doing all in its power to make this a reality. To demonstrate its commitment to its employees, TLI Solutions has developed and implemented a Corporate Safety and Health Plan.

3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

All site operational and other personnel having exposure potential to site hazards are subject to the requirements of this APP. Work may not be performed in a manner that conflicts with the intent of, or the inherent safety, health, or environmental precautions expressed in this APP. After initial correction, personnel continuing to violate safety procedures will be dismissed from the site.

Figure 1 shows the key project personnel for safety and health and the lines of authority.

3.1 TLI SOLUTIONS PROJECT MANAGER

The TLI Solutions Project Manager (PM), Gene Barber or his designee, will provide project management and administrative support during field operations. The TLI Solutions PM will prepare or approve all United States Army Corps of Engineers (USACE) required reports and documents. TLI Solutions will have overall responsibility for the health and safety of site personnel operating under the Scope of Work (SOW) for the SI at UBG, Sierra Army Depot. The TLI Solutions PM will be the point of contact (POC) on all project-related issues with USACE.

3.2 EARTH TECH PROJECT MANAGER

The Earth Tech Project Manager (Earth Tech PM) will provide project management and administrative support during field operations and will report to the TLI Solutions PM.

3.3 TLI SOLUTIONS SITE UNEXPLODED ORDNANCE SAFETY OFFICER

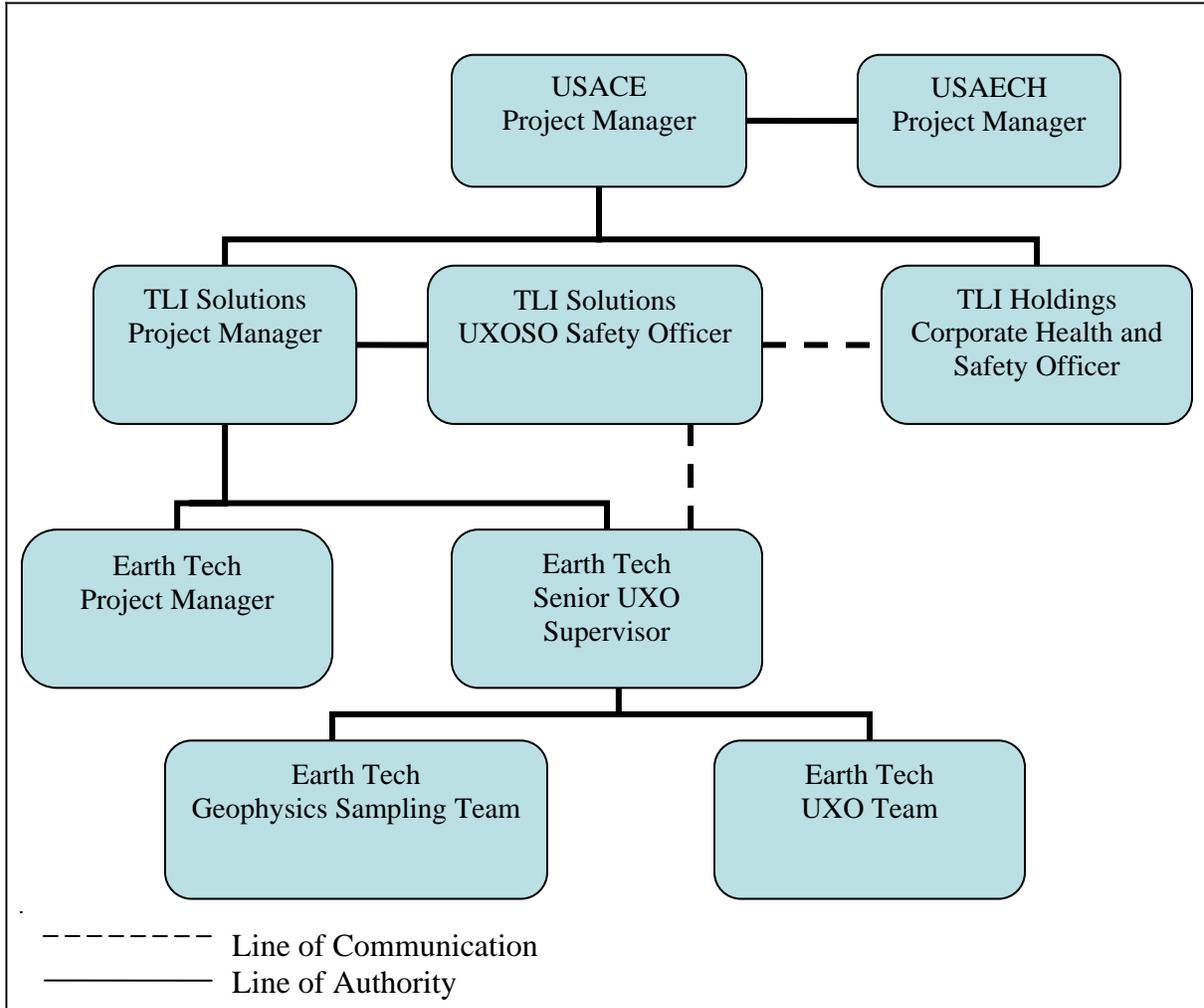
The TLI Solutions Site UXOSO, Jerry Glance, reports directly to the TLI Solutions PM. The TLI Solutions UXOSO will serve as the Site Safety Officer (SSO). The UXOSO will be responsible for implementing and enforcing the requirements of this APP. Any changes in operations or conditions requiring changes to this APP will be coordinated through the TLI Solutions PM and the TLI Holdings Safety Office.

The UXOSO will coordinate closely with the Earth Tech SUXOS regarding all safety matters on the site. He will be authorized to stop work at any time for safety and health reasons and will immediately notify the PM's, SUXOS and the USACE Safety Specialist (if present) of the stop work and explain the cause of the stoppage.

The UXOSO will provide safety training to on-site employees and subcontractors through mobilization training sessions, daily tailgate safety briefings, daily debriefings, weekly supervisor safety meetings, visitor training and personal protective equipment (PPE) training, as well as any other training needs that may arise during the course of operations. The UXOSO will enforce the proper levels of PPE in accordance with this APP and will coordinate with the TLI Holdings Corporate Safety Office prior to making any changes in PPE requirements.

The UXOSO will conduct daily safety inspections, weekly safety audits, and maintain all required safety forms (as well as the safety log). In addition, the UXOSO will follow up on any discrepancies noted until correction has been verified. The UXOSO will investigate all on-site accidents, incidents, and near misses.

Figure 1: Project Safety Organizational Chart



3.4 SENIOR UNEXPLODED ORDNANCE SUPERVISOR

The SUXOS will enforce all Work Plan and APP requirements. He will provide direct supervision of on-site personnel and will coordinate activities with subcontractor personnel. The SUXOS will coordinate closely with the Earth Tech PM regarding site activities.

The SUXOS will work closely with the TLI Solutions UXOSO to ensure that all employees on the site are adequately trained and continue to follow safe operating procedures. The SUXOS is the primary POC for the UXOSO regarding resolution of on-site safety issues.

3.5 TLI HOLDINGS CORPORATE SAFETY OFFICER

The TLI Holdings Corporate Safety Office is responsible for the review and approval of the APP and recommended changes submitted to the government's Contracting Officer for final approval. The Corporate Health and Safety Officer is Dr. Phil Williams, a Certified Industrial Hygienist (CIH). The Corporate Safety Officer will report, review, and analyze all incidents in accordance with Section 8.0 of this APP. The contracted Deputy Health and Safety Officer is Ms. Holli L. Merchant, also a CIH.

The TLI Holdings Corporate Safety Office will authorize periodic, unannounced audits of this project safety program during the course of contract work on this site.

3.6 SUBCONTRACTOR RESPONSIBILITIES

All subcontractor personnel working on this site will be required to follow the requirements of this APP. In addition, Earth Tech will prepare an internal document (Safe Work Procedures) to be used by their on-site personnel. The Earth Tech Safe Work Procedures will be available on-site during all field activities.

All TLI Solutions subcontractors will be responsible for providing medically approved and properly trained site personnel with certifications provided in their APP and updated as necessary. Current training certificates (i.e., 40-hour, 8-hour refresher, and 8-hour supervisor) and medical clearance certifications will be maintained on-site with the UXOSO. The Earth Tech PM is responsible for ensuring that all on-site staff have read this APP and the Earth Tech Safe Work Procedures, and follow the protocols outlined in these documents to ensure that work is conducted in a safe manner.

All subcontractors will be responsible for selecting and providing their own equipment, including PPE that is safe and clean for operation and free from any obvious hazards.

3.7 RESPONSIBILITIES OF ALL SITE PERSONNEL

All TLI Solutions, USACE, and subcontractor personnel and visitors who will be involved in on-site activities are responsible for the following:

- Taking all reasonable precautions to prevent injury to site personnel and being alert to potentially harmful situations
- Performing only those tasks that can be done safely with proper training provided
- All on-site personnel have stop-work authority when imminent safety or environmental hazards are found or identified
- Notifying the TLI Solutions UXOSO of any special medical conditions (e.g., allergies, contact lenses, diabetes, recent injuries, etc.) that may be impacted by site operations. TLI Solutions team members accomplish this by completing a Medical Data Sheet prior to the commencement of field activities.
- Notifying the TLI Solutions UXOSO of any prescription and/or nonprescription medication that a worker may be taking that might cause drowsiness, anxiety, or

other unfavorable side effects. TLI Solutions team members accomplish this by conducted by completing a Medical Data Sheet prior to the commencement of field activities.

- Preventing spillage and splash of materials to the greatest extent possible
- Practicing good housekeeping by keeping the work area and vehicles, neat, clean, and in order
- Immediately reporting all injuries, no matter how minor, to the TLI Solutions UXOSO
- Complying with the APP and all safety and health recommendations, precautions, and properly using the PPE as determined by this APP and/or the TLI Solutions UXOSO

4.0 SUBCONTRACTORS AND SUPPLIERS

TLI Solutions has retained Earth Tech, Inc. as its subcontractor to perform field activities associated with the SI at UBG, Sierra Army Depot. Earth Tech's roles and responsibilities are addressed in Sections 3.2, 3.6, and 3.7, above.

5.0 EMPLOYEE TRAINING

5.1 GENERAL INFORMATION

Prior to commencement of site activities, UXOSO will ensure that all TLI Solutions employees and subcontractor personnel who are actually engaged in UXO/MEC operations are informed of all site hazards. This information will be dependent on the nature and degree of exposure to UXO/MEC and physical hazards, which are likely to result from participation in site operations. TLI Solutions will accomplish this by ensuring that all personnel entering the site have received the appropriate OSHA and site-specific training, as outlined in this section, prior to participation in site activities.

5.2 HAZARDOUS WASTE WORKERS TRAINING

5.2.1 40-Hour General Site Workers Training

All TLI Solutions employees and subcontractors involved in UXO/MEC site activities must have received a minimum of 40 hours of hazardous, toxic, and radiological waste (HTRW) health and safety instruction off-site in accordance with *29 CFR 1910.120(e)*. In addition, site workers will have received a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

Current training of all employees on the site will be verified prior to mobilization. This level of training is also required for all site visitors who enter a potentially hazardous work area where respirators or other PPE are required to protect entrants from known or potential overexposures.

5.2.2 8-Hour Refresher Training

All employees and subcontractors will receive eight hours of refresher training annually on the items specified in *29 CFR 1910.120(e)*, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

5.2.3 Management and Supervisor Training

On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations will have received 40 hours of initial training and 3 days of supervised field experience, and at least 8 additional hours of specialized manager/supervisor training at the time of job assignment.

This additional training includes a review of the TLI Holdings Corporate Safety and Health Plan (CSHP), management of UXO/MEC cleanup operations, management of site work zones, communication with the public and the media, PPE selection and limitations, spill containment, and monitoring site hazards. The safety and health staff, with specific responsibilities for safety and health guidance on-site will receive the training provided to

general site workers and their supervisors. They also receive additional training in safety and health issues, policies, and techniques.

5.3 SITE-SPECIFIC TRAINING

In order to fulfill the site information training requirements of *29 CFR 1910.120(b)(1)(iv)* and *29 CFR 1910.120(e)(1)*, all TLI Solutions employees, contractors, subcontractors, and visitors will attend site-specific training sessions. These training sessions will apply to individual jobs and responsibilities and will provide an overview of the site hazards and the means to control those hazards.

5.3.1 General Site-Specific Training

This training will be conducted by the UXOSO and may address the following subject areas, depending upon individual jobs: details of the APP; employee rights and responsibilities; safe work practices; nature and extent of anticipated chemical and physical hazards; measures and procedures for controlling site hazards; handling emergencies and accidents; rules and regulations for vehicle use; safe use of field equipment; handling, storage, and transportation of hazardous materials; use, care, and limitations of PPE, to include proper donning, doffing, cleaning, and storage; and hazard communication.

5.3.2 UXO/MEC Training

All UXO personnel assigned to positions as UXO Technician I, UXO Technician II, UXO Technician III, UXOSO, and SUXOS, will meet the qualification requirements detailed in Department of Defense Explosive Safety Board (DDESB) Technical Paper (TP) 18, Dated 20 December 2004. A copy of their certificates of graduation will be kept on file at corporate headquarters and on-site. UXO-qualified personnel will have knowledge and experience in military ordnance; ordnance components; and explosives location, identification, rendering safe recovery/removal, transportation, and disposal safety precautions. UXO-qualified personnel will have the knowledge and experience to effect safe handling and transportation of found ordnance items.

Non-UXO-qualified personnel working or visiting the UXO/MEC sites will receive a site-specific UXO/MEC recognition briefing from the UXOSO. This site-specific training will be used to familiarize non-UXO-qualified personnel with the appearance of ordnance type items that may be found on site. Non-UXO-qualified personnel will not touch any ordnance-related items unless they have been inspected first by UXO-qualified personnel and determined to be ordnance related scrap or inert ordnance.

5.3.3 First Aid/Cardiopulmonary Resuscitation Training

A minimum of two individuals certified in first aid/cardiopulmonary resuscitation (CPR) will be on-site to provide immediate response to an accident situation until medical

assistance arrives on the site. The name or names of first aid/CPR qualified individuals will be given to employees during the daily Tailgate Safety Briefing.

5.3.4 Daily Tailgate Safety Briefing

Tailgate Safety Briefings consist of providing short informational sessions in various subjects that give the site worker knowledge and confidence in performing duties in a potentially hazardous environment. The tailgate safety briefing will be given prior to commencing work each day and will include such items as:

- Scope of Work
- Expected weather conditions
- General site hazards
- UXO hazards
- PPE required at each site
- Emergency evacuation procedures
- Heat/cold stress precautions
- Buddy system procedures
- A review of any safety violations from the previous day

Additional briefings will be provided, as required, concerning the use of safety equipment, emergency medical procedures, emergency assistance notification procedures, accident prevention, the Work Plan, and site orientation to ensure that accomplishment of the project can be carried out in a safe and effective manner.

5.3.5 Daily Debriefing

At the conclusion of each workday, a debriefing for all employees will be held, if appropriate, and the day's work will be discussed to determine if changes are warranted before commencing the next day's activities.

5.3.6 Periodic Site Training

On the first day of each work week/period or more frequently if needed, a pertinent topic will be selected and elaborated upon by the UXOSO during the tailgate safety briefing. These safety meetings will help ensure the safety and health of site personnel in the performance of regular work activities and in emergency situations. Safety meetings will be documented in the appropriate log.

5.3.7 Visitor Training

All visitors to the site will be escorted and must receive, at a minimum, a briefing on site conditions, hazards, and emergency response procedures. Visitors will not be permitted in the restricted work areas unless they have the appropriate level of OSHA training. Visitors not complying with the above requirements will not enter the restricted work

areas. They may observe site conditions from a safe distance. All visitors will make appropriate entries in the Visitor's Log.

5.3.8 Documentation

A training record will be kept in each employee's individual file to confirm that adequate training for assigned tasks has been provided and that training is current. This documentation will also be available on-site.

6.0 SAFETY AND HEALTH INSPECTIONS

There are no tasks to be performed during activities under the SOW which require external agency safety and health inspections. Should additional tasks be added to the SOW that requires additional inspection activities, this section of the APP shall be revised to include these procedures.

Additionally, due to the relatively short duration of SI field activities, and size of field teams, the UXOSO will be monitoring team activities and periodically (as required) conducting spot inspections to ensure compliance with this APP. Depending on the length of the field activities, these inspections may consist of weekly or daily safety audits. These audits would primarily consist of evaluating appropriate PPE, team composition, communication equipment, vehicle safety equipment, and general knowledge of health and safety protocols for these field activities. Therefore, additional inspections will not be necessary.

7.0 SAFETY AND HEALTH EXPECTATIONS, INCENTIVE PROGRAMS, AND COMPLIANCE

TLI Solutions project safety and health goals are:

- Zero fatalities or serious injuries
- Reduce injuries, lost workday accidents, and workers compensation claims
- Prevention of damage or destruction to company property or equipment
- Increased productivity through reduction of injuries
- Reduced worker's compensation costs
- Enhance company's image by working safely
- Keep safety a paramount part of the workers daily activities
- Recognize and reward safe work practices
- Improve morale and productivity

The following practices are used by TLI Solutions in an effort to facilitate these safety and health goals.

7.1 GENERAL WORK PRACTICES

The procedures and guidelines detailed below are to be adhered to by all personnel performing project activities at Upper Burning Ground, Sierra Army Depot. These procedures and guidelines are provided to ensure a safe work environment for all workers on-site.

General work practices include the following:

1. Safe work practices will be implemented whenever possible to eliminate or reduce the potential for employee exposure.
2. Employees will wash their hands as soon as possible after removal of gloves and/or other PPE.
3. Employees will wash hands and any other skin with soap and water, or flush mucous membranes with water immediately following contact with blood or other potentially infectious materials.
4. If potentially contaminated sharps are encountered, the item will be immediately disposed in an appropriate container.
5. Eating, drinking, smoking, applying cosmetics or lip balm, handling of contact lenses, or storage/handling of food are prohibited in all areas where potentially infectious materials and potentially hazardous materials are present.
6. Equipment that has become contaminated will be decontaminated prior to servicing or storage, unless decontamination is not feasible, in which case the equipment will be disposed of properly.

7.2 AS LOW AS REASONABLY ACHIEVABLE POLICY

The TLI Solutions policy is to maintain exposures to hazardous UXO, and chemical, physical, or biological hazards at levels that are as low as reasonably achievable (ALARA). ALARA is achieved through proper employee training, adequate work procedures, adequate engineering controls, good personal hygiene practices, and use of PPE, when required. Each individual working in a restricted area, herein after referred to as the Operational Zone (OZ), and defined as the area where the physical investigation is taking place and where a physical hazard may exist, is required to adhere to ALARA rules, regulations, and concepts outlined in this APP. ALARA applies to all phases of the operation and should be considered from the planning phase through to the project's completion. ALARA policies will be re-evaluated and updated by the UXOSO and Earth Tech SUXOS as required by changes in site conditions.

7.3 PERSONNEL PRACTICES

Safe work practices can reduce hazards due to normal site activities. Personnel must keep the following guidelines below in mind while conducting field activities. General personnel requirements include:

1. Horseplay or fighting is prohibited.
2. Eating, drinking, smoking, chewing gum, tobacco, or any other hands-to-face activities are prohibited on-site, except in designated areas after both face and hands have been washed.
3. When required to sit or kneel on the ground, avoid contaminated surfaces.
4. Avoid placing equipment on contaminated surfaces.
5. Climbing on or over obstacles is prohibited. Stacks of materials can be unstable and could cause injury.
6. Open flames of any type are prohibited on-site.
7. Bringing defective or unsafe equipment on-site is prohibited.
8. Only authorized employees may enter the work site. Visitors must check in with the UXOSO, receive an appropriate safety briefing, and be escorted by UXO-qualified personnel at all times while on the site.
9. Hazard assessment is a continuous process. Personnel must be aware of their surroundings and the hazards (UXO, chemical, physical, etc.) that are or may be present.
10. The number of personnel in the OZ will be the minimum number necessary to perform work tasks in a safe and efficient manner (a minimum of two).
11. Team members will be familiar with the physical characteristics of each site including wind direction, site access, and the location of communication devices and safety/emergency equipment.
12. The location of overhead power lines and underground utilities must be established.
13. Detection or appearance of unusual liquids, odors, or discolored soil could indicate the presence of contaminants and should be reported to the UXOSO immediately.

14. Site personnel are to report any other unusual or potentially hazardous condition to the UXOSO for investigation and/or corrective action.
15. Employees will obey all motor vehicle laws and posted speed limits while operating any motor vehicle on or off the project site.

7.4 BUDDY SYSTEM PROTOCOL

The buddy system is a safety practice in which each individual is concerned with the health and well-being of co-workers. The buddy system will be implemented during all on-site activities and will be incorporated whenever workers may be isolated or as determined by the UXOSO. The SUXOS will assign “buddies” to ensure accounting of all site personnel. Additional procedures include:

1. A minimum of two personnel (one being a UXO-qualified person) will be present during all MEC operations so that one person will always act as a safety observer. During all MEC operations, only the minimum number of personnel required to safely perform the task will be allowed on-site. All others will vacate to a predetermined assembly point.
2. At no time will an individual desert their “buddy” unless their “buddy” goes down and it is considered too hazardous to render assistance. “Buddies” will enter and exit the OZ together and frequently monitor one another for signs of fatigue, heat stress, and any other problems. In such cases, the worker in danger may not be aware he/she is having a problem. The “buddy” must always be alert to changes in the behavior of their “buddy” so that they can remove him/her from the situation immediately.
3. “Buddies” should inspect each other’s equipment, including PPE, to ensure that it is adequate and in proper working order.

7.5 MEDICAL SURVEILLANCE

Medical surveillance of TLI Solutions and subcontractor employees will be conducted in accordance with the requirements of *OSHA 29 CFR 1910.120(f)*, *29 CFR 1910.134(e)*, *29 CFR 1910.95*, and the TLI Solutions CSHP. All TLI Solutions employees working on the SI at UBG, Sierra Army Depot are in the TLI Solutions Medical Surveillance Program. A baseline health assessment is conducted prior to participating in site operations and it is updated annually thereafter, which determines the worker’s ability to perform UXO/MEC operations in a safe and healthful manner. Prior to assigning any employee to work on this project, that employee’s records will be checked to ensure that the medical surveillance physical is current and will remain in effect for the duration of the assignment. Current and updated TLI Solutions medical clearance certification will be maintained onsite with the UXOSO.

7.5.1 Physician’s Statement

The results of the physical examination will be made available to the employee, and a written examining physician’s statement will be sent to TLI Holdings Medical

Consultant, Dr. Mark Strauss. The Medical Consultant's physician's statement will include the following:

- The physician's opinion regarding any conditions that would place the employee at an increased risk from working in UXO/MEC operations
- The physician's opinion regarding the employee's ability to work at hazardous waste operations and emergency response (HAZWOPER) sites
- The physician's recommended limitations upon the employee's assigned work, if any, and clearance to wear a respirator
- A statement indicating that the employee has been informed, by the physician, of the results of the examination and any conditions which may require further examination or treatment

A copy of the current physician's statement will be kept in a sealed envelope in the employee's file on-site for the duration of work on the project.

7.5.2 Supplemental Examination

Any site worker, who has been injured, developed signs or a symptom of possible over-exposure, received a documented over-exposure without the use of respiratory protection, or shows any other signs of impaired health will undergo a supplemental examination. The contents of this examination will be based upon the type of injury, illness, signs or symptoms, or exposure involved, and will be determined by the attending physician or the TLI Holdings Medical Consultant, as needed. Prior to reassignment to site activities, the physician will certify that the employee is fit to return to work. If necessary, the physician will specify in writing any activity restrictions or additional tests that may be required.

7.5.3 Exit Examination

Upon termination of employment, personnel who have worked continuously (an 8 hour shift or 40 hour week in an area with suspected contamination) at a TLI Solutions UXO/MEC or HAZWOPER project site will undergo an exit examination. The needs and contents of this examination will be evaluated by the Medical Consultant after considering the date and contents of the most recent medical examination, field work done since the last examination, and the employee's medical history.

7.6 ENVIRONMENTAL AND PERSONNEL MONITORING

On-site monitoring will be conducted during specific site activities to evaluate the potential physical hazards that may be encountered. Specific areas of interest will be continuous awareness of UXO/Munitions and Explosives of Concern related materials, poisonous plants, animals, spiders, snakes, safe footing on loose or rough surfaces, obstacles on rocky slopes, and changes in weather conditions. These on-site monitoring activities will be used to assist in determining the effectiveness of control measures, the need for upgrading or downgrading of PPE, and the effectiveness of safe work practices.

7.6.1 Perimeter Monitoring Requirements

There will be no perimeter monitoring conducted during activities under the SOW because site operations that would result in the release of toxic materials in a gaseous, vapor, or particulate form will not be conducted.

7.6.2 Personal Monitoring Requirements

During field work in warm weather, the TLI Solutions UXOSO will check current weather conditions prior to starting work and periodically throughout the day and interpret the conditions by use of the California OSHA Heat Index Chart . This information will be used to determine work-rest periods. The results of previous monitoring or the detection of factors that indicate a potential for exposure may require an increase of monitoring frequency.

7.6.3 Monitoring Equipment Calibration and Maintenance

All sampling and monitoring instrumentation used will be calibrated and/or response-checked in accordance with the manufacturer's specifications before and after use each day. If an instrument fails to calibrate or respond correctly, it will be removed from service until it can be repaired in accordance with manufacturer's specification.

7.6.4 Blood-Borne Pathogen Monitoring

Minimum requirements for procedures to prevent contact with blood or other potentially infectious materials that comply with OSHA standard *29 CFR 1910.1030* will be adhered to for this project. This section applies to all TLI Solutions operations and personnel whose occupational responsibilities may present possible exposures to blood or other potentially infectious materials. This program meets or exceeds all requirements set forth in OSHA standard *29 CFR 1910.1030*.

TLI Solutions will also comply with other OSHA, state, and local regulations, or client requirements for minimizing contact with blood borne pathogens (BBPs). Protective clothing including latex gloves and safety glasses will be used during any potential exposure to BBPs. Additionally, BBP cleanup kits will be available on-site during field activities.

The strategy of "Universal Precautions" was developed by the Centers for Disease Control to address concerns regarding transmission of human immunodeficiency virus (HIV). This "Universal Precautions" concept stresses that all sources should be assumed to be infectious for HIV, Hepatitis B virus (HBV), and other BBPs. The philosophy of universal precautions will be applied whenever TLI Solutions employees render first aid involving potential contact with blood or other potentially infectious materials.

8.0 ACCIDENT REPORTING

All accidents that occur during an operation, or project, or while on a military facility shall be investigated, reported, and analyzed.

8.1 RESPONSIBILITIES

Employees and subcontractors are responsible for reporting all injuries or occupational related illnesses as soon as possible to the SUXOS and the UXOSO. The SUXOS is responsible for notifying the on-site USACE Safety representative, if present, and the TLI Solutions PM as soon as possible after learning of the incident. The SUXOS shall immediately report to the TLI Solutions PM any incident, which could bring adverse attention or publicity to the U.S. Army, USACE, or TLI Solutions. The UXOSO shall notify the TLI Holdings Corporate Safety Office and the SIAD Safety Office and Installation POC of all accidents within 24 hours. The UXOSO shall initiate an investigation and document all information pertaining to the incident. The TLI Solutions PM shall notify the Corps of Engineers – Sacramento District Contracting Officer by telephone as soon as possible after learning of the incident. The TLI Solutions PM shall forward any reports required.

8.2 ACCIDENT/INCIDENT NOTIFICATION PROCEDURES

8.2.1 On-site USACE Safety Representative

An accident with any of the consequences mentioned will be reported immediately to the on-site USACE Safety representative if present.

8.2.2 Corps of Engineers – Sacramento Center Contracting Officer

Accidents/incidents, which result in a fatality, injury of employees, lost workdays, and/or property damage assessed at a cost of \$2,000 or more, shall be reported by telephone to the Government's Contracting Officer as soon as possible after learning of the incident. The report shall contain as much information as is known concerning the incident. Following the report to the Contracting Officer, the Chief of the USACE-Sacramento Safety and Occupational Health Office (CESPK-SO) will be contacted. An *ENG Form 3394* (see Attachment 2) shall be completed in accordance with the instructions attached to the form and forwarded to the Government's Contracting Officer within five working days after the incident. In addition, copies will be provided to the USACE-Sacramento Project Manager and the CESPK-SO. The *ENG Form 3394* shall be legible and signed by the supervisor of the person injured (or supervisor of the activity where property damage occurred) and by the TLI Solutions PM.

8.2.3 TLI Solutions Safety Office

All accidents/incidents that occur at the project site shall be investigated, reported, and analyzed. The TLI Holdings Accident Report Form shall be initiated by the site UXOSO

and submitted to the TLI Solutions Safety Office within 20 calendar days after the incident. If the *ENG Form 3394* is required, it shall be forwarded to the TLI Solutions Safety Officer for review, action, signature, and forwarding to the Government's Contracting Officer.

9.0 MEDICAL SUPPORT

9.1 PRE-EMERGENCY PLANNING

The UXOSO will perform pre-emergency planning before starting field activities and will coordinate emergency response with emergency medical technician (EMT)/police/fire personnel when appropriate. Pre-emergency planning meetings shall be used to inform local authorities of the nature of site activities that will be performed under the SOW and the potential hazards that activities may pose to site workers, the environment, and the public. The UXOSO will verify all on-site emergency services information, to include telephone numbers and procedures for requesting services. It will be the UXOSO's responsibility to post these procedures and telephone contact numbers in accordance with the requirements of this APP.

9.2 POTENTIAL EMERGENCIES

The following are the potential emergencies that may arise during the conduct of activities under the SOW:

- Injury or illness associated with physical, chemical, or biological hazards
- Inclement weather
- Fire
- Personal injury from the unintentional detonation of MEC

9.3 EMERGENCY EQUIPMENT

Emergency equipment shall be maintained in proper working order and checked by assigned personnel daily. It will be the responsibility of the UXOSO to maintain the site emergency equipment in good working order. The UXOSO will inspect all emergency equipment at least weekly to ensure completeness and proper working condition. Any time that emergency equipment is used it will be reported to the UXOSO so that those items used can be replaced immediately. Site operations shall not be allowed to continue if the required emergency equipment is not immediately available on site.

9.3.1 Team/Field Vehicles

Each team/field vehicle will as a minimum contain the following equipment:

- a. Emergency contact list
- b. Hospital route map
- c. Fire extinguisher rated for 1A:10B:C
- d. First aid kit
- e. Blood Borne Pathogen kit
- f. Emergency eyewash (portable bottles)

9.3.2 First Aid Kits

First aid kits are provided by TLI Solutions. The size and number of first aid kits shall be sufficient to accommodate the maximum number of people on site at any given time. First aid kits will be located in all operational vehicles. A Type III First Aid Kit will be located with the UXOSO.

9.3.3 Biohazard Spill Kit

Biohazard kits will be available during operations at the site. The kit will be used any time an injury occurs or where there is the release of body fluids.

9.3.4 Eyewash Kit

Portable bottles of eyewash will be available during operations at the site where the potential for hazardous materials to contact the eyes. Portable eyewash bottles will be used while the injured person is being transported to the site eyewash station or nearest medical center.

9.4 EMERGENCY MEDICAL TREATMENT AND FIRST AID

In the event of an emergency involving personal injury or illness, on-site first aid/CPR-trained personnel shall render first aid. Emergency medical services will be summoned if deemed necessary by the UXOSO. A list of emergency contact information is provided in Table 2 in Section 11.1.3 and a map to the nearest hospital is included as Figure 2 in Section 9.8 of this APP. If the injured employee feels he/she requires additional treatment, the employee will be given access to professional medical attention.

TLI Solutions will have a minimum of two personnel trained and qualified in CPR and First Aid on-site to provide immediate response until the arrival of professional medical personnel. Adequate first aid supplies will be on hand at all times for qualified personnel to use.

The UXOSO will ensure that all employees are informed who the First Aid/CPR-trained and qualified personnel are during the daily Site Safety Briefings.

The UXOSO will have final authority on the decision to require additional professional medical services (i.e. paramedics, hospital visit, etc.) for any illness or injury. If the injured employee feels he/she requires additional treatment, the employee will be given access to professional medical attention. Section 9.8 contains information and a map for the nearest off-site medical facility.

9.5 EMERGENCY SERVICES

The UXOSO shall verify the availability of all local emergency services and confirm the procedures used to request the service. It shall be the responsibility of the SUXOS to

ensure that adequate off-site communications are available at all times. A break in off-site communications shall result in the temporary halting of all on-site activities until communications are reestablished. Off-site communications shall be accomplished using telephone service to the responsible support agencies (See Para 12.1.4 Communications). Emergency telephone numbers are presented in Table 2 in Section 11.1.3 of this APP and the UXOSO shall post these numbers in all site vehicles. All site personnel will receive instruction on the procedures for obtaining off-site emergency services.

9.6 INITIAL REPORTING PROCEDURES

At the onset of an emergency, the respective team leader will contact the UXOSO and/or the SUXOS to start the emergency response action. Once action is initiated, the UXOSO will notify the USACE On-site Safety Specialist as soon as possible. The UXOSO will ensure that remaining site personnel are advised of the situation and informed of their proper response procedures. Personnel will be notified to:

- Stop work activities
- Evacuate to the TLI Solutions site vehicle and proceed to the work site “Personnel Emergency Rally Point” (Described daily during the “Tailgate Safety Briefing,” by the UXOSO)
- Begin emergency procedures
- Notify off-site emergency response organizations

9.7 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATION

To ensure a smooth process during an emergency response, the following positions have been established. Site personnel and local points of contact will be notified of changes to personnel roles, and lines of authority and communications as they take place.

9.7.1 On-Site Incident Commander

In the event of an emergency, the UXOSO will assume the responsibility of the On-scene Incident Commander. The SUXOS will assist the UXOSO, and in the event that the UXOSO is unavailable or incapacitated, the SUXOS will be the alternate person to assume this role. The On-scene Incident Commander will have the responsibility for directing all on-site and off-site emergency response personnel until relieved by another competent authority, and shall advise the USACE On-site Safety Specialist of the emergency as soon as possible.

9.7.2 On-Site Emergency Response Personnel

During site activities TLI Solutions personnel will act in the role of on-site emergency response personnel. The personnel assigned to this role will be designated by the SUXOS prior to initiation of site activities involving the potential for an on-site emergency. TLI Solutions on-site emergency response personnel will receive training in the response actions that they will be authorized to, and may be directed to, perform

during a site emergency.

9.8 ROUTES TO MEDICAL FACILITIES

Lassen Community Hospital
 560 Hospital Lane, Susanville, CA.
 Phone: (530) 252-2000

Approximate Drive Time: 46 Minutes, Distance 37.31 Miles
 Directions to Lassen Community Hospital:

	1: Start out going WEST on WENDEL RD toward DUCK LAKE RD. Turn LEFT onto AMEDEE RD.	7.7 miles
	2: Turn RIGHT to stay on AMEDEE RD. AMEDEE RD becomes an unnamed road.	4.3 miles
	3: Stay STRAIGHT to go onto ANTOLA RD.	2.1 miles
	4: Turn RIGHT onto FISH AND GAME RD.	1.7 miles
	5: Turn LEFT onto WENDEL RD	1.7 miles
	6: Turn LEFT onto US-395. Take the CA-36 ramp.	15.7 miles
	7: Turn SLIGHT RIGHT onto CA-36	4.4 miles
	8: Turn LEFT onto RICHMOND RD N / S WEATHERLOW St. Continue to follow RICHMOND RD N.	0.7 miles
	9: Turn RIGHT onto HOSPITAL LN.	<0.1 miles
	10: End at Lassen Community Hospital: 560 Hospital Ln, Susanville, CA 96130, US	
Total Est. Time: 1 hour, 9 minutes		Total Est. Distance: 37.58 miles

Figure 2: Maps to Hospital



10.0 PERSONAL PROTECTIVE EQUIPMENT

Whenever engineering controls or other protective measures are not feasible or adequate to reduce exposures and safeguard the worker, the Site Safety Officer will select appropriate PPE. PPE will be selected on the basis of hazards known or suspected at the work site, and the level of PPE will not be reduced until adequate documentation can demonstrate that the hazard level has been reduced enough to warrant such adjustment.

10.1 PPE SELECTION

Each task outlined in the SOW will be assessed in the Activity Hazard Analysis (AHA) prior to its initiation to determine the risk of personnel exposure to safety and health hazards, which may be encountered during its conduct. The AHA will be based on available information pertaining to the historical use of the site, site contaminant characterization data, and the anticipated operational hazards. This information will be provided by the client or collected by TLI Solutions site personnel. The PPE assigned as a result of the hazard assessment represents the minimum PPE to be used during initial site activities.

Hazard/risk assessment is a continuing process; therefore, changes in the initial types and levels of PPE will be made in accordance with information obtained from the actual implementation of site operations and data derived from the site monitoring. As a general rule, the levels of PPE will need to be reassessed if any of the following occur:

- Commencement of a new work phase, such as the start of work on a different portion of the site, or different types of work due to a change in the SOW
- Change in job tasks during a work phase
- Change of season/weather
- When temperature extremes or individual medical considerations limit the safe use of PPE
- Unanticipated contaminants are encountered
- Change in expected levels of contaminants
- Change in work scope, which affects the degree of contact with contaminants

If work tasks are added, or amended, after completion and approval of the APP, the UXOSO will conduct the task hazard assessment and consult with the TLI Solutions Safety Office. The level and type of PPE to be used will be identified and the UXOSO will complete the “Certificate of Task Hazard Assessment” form included as Attachment 3 of this APP. The TLI Solutions Safety Office will allow any changes in PPE, which involve downgrading the level of PPE, only after review.

10.1.1 Selection Criteria

The TLI Holdings Corporate Safety Office reviews the PPE recommended by the UXOSO. During the selection of PPE, the TLI Holdings Safety Office and UXOSO will utilize general chemical resistance information, the manufacturer’s permeation and

breakthrough specifications, and the anticipated chemical and physical hazards to select the level and types of PPE to be used for each task. Once the specific types of PPE have been selected for each task, the UXOSO and TLI Solutions Safety Office will ensure that the items purchased will properly fit each employee designated to wear PPE. The following factors also will be considered:

- Limitations of the equipment
- Work mission duration
- Temperature extremes
- Material flexibility
- Durability/integrity of the equipment
- Selection of respiratory protection, in accordance with the Respiratory Protection Program

10.1.2 Level D PPE

At a minimum, the protective clothing worn by all personnel will meet the requirements for Level D PPE. Level D clothing should also be worn only if the activity in which personnel are engaged does not have the potential for splash, immersion or any other contact with hazardous substances. Level D involves the use of the following PPE:

- Work clothes or coveralls (cotton)
- Leather work gloves will be worn when performing work tasks (i.e. using shovels, scrapers or other hand tools), when utilizing detection instruments and for any other activities which may produce scrapes, scratches or punctures to the hands or fingers
- Nitrile gloves will be worn when collecting soil samples
- Footwear will consist of over the ankle leather work or hiking boots
- Eyewear providing protection against ultraviolet light and glare will be provided for protection if working around bodies of water. This will assist in protecting against the reflective glare of sunlight off the surface of the water
- Safety glasses or goggles (when working in high winds, dusty environments, or when directed by SUXOS or UXOSO)
- Hearing protection (when working in a noise hazard area)
- Head protection will be worn when working in a field environment that presents hazards that could potentially cause head injuries

10.1.3 Inclement Weather PPE

Other than working in hot/cold weather, or light rain, activities to be conducted under the SOW will cease in the event of severe weather conditions. TLI Solutions will ensure that employees take appropriate precautions to protect themselves from inclement weather. When there are warnings or indications of impending severe weather (heavy rains, damaging winds, tornadoes, floods, etc.), conditions will be monitored and appropriate precautions taken to protect personnel and property from the effects of the severe weather. Teams will evacuate if an electrical storm is within 10 miles of the project site.

10.2 PPE USE AND LIMITATIONS

Whenever feasible, engineering controls and work practices, or a combination thereof, will be utilized to maintain personal exposures to hazardous substances below established exposure limits and to protect site workers from other safety and health hazards. The exposure limits used by TLI Solutions will be the OSHA Permissible Exposure Limits (PELs) and the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs). The most stringent (lower) of these two thresholds will be used as the exposure limit for determination of the appropriate PPE.

Other recognized published exposure levels, such as the Threshold Limit Values (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) and those found on Material Safety Data Sheets (MSDSs), will be used if needed or appropriate. TLI Solutions will not utilize a system of employee rotation as a means of complying with the PEL, REL, TLV, or other published limits. Compliance will be maintained through engineering controls, wherever possible, and if the hazard cannot be engineered out of the work area, PPE and safe work practices will be used to prevent exposures in excess of the PELs or other selected limits.

10.3 WORK MISSION DURATION

TLI Solutions anticipates the sampling and analysis to be accomplished within two weeks. UXO personnel involved in performing UXO field operations shall be limited to a 40-hour workweek. The workweek, for activities, on the project will consist of four, 10-hour days. Two consecutive workweeks shall be separated by at least 48-hours of rest. Once PPE is selected, the safe duration of work/rest periods will be determined based on the:

- Anticipated work rate
- Ambient temperature and other environmental factors
- Type of protective ensemble
- Individual worker characteristics and fitness

10.4 PPE MAINTENANCE AND STORAGE

The UXOSO will be responsible for ensuring that PPE is in good, clean, working order prior to issuing the PPE the first time. Once initial inspection is completed, site personnel will be responsible for the inspection and maintenance of re-usable articles of PPE. Site personnel will ensure that re-usable articles of PPE are maintained in a clean and sanitary fashion.

10.4.1 Maintenance

Maintenance of PPE can vary greatly, based upon the complexity of the PPE and the intricacy of the repair involved. The UXOSO will become familiar with the manufacturer's recommended maintenance and, when possible, repair defective PPE. If

unable or unauthorized to conduct the repair, the UXOSO will return the item to the manufacturer for repair, or procure a replacement.

10.4.2 Storage

PPE will be stored in a location that is protected from the harmful effects of sunlight, damaging chemicals, moisture, extreme temperatures, impact, or crushing.

10.5 PPE PROCEDURES

TLI Solutions does not anticipate activities to be conducted in areas containing HTRW contamination. Therefore, decontamination and disposal will not be required during activities under this project with the exception of nitrile gloves, which will be properly disposed.

All TLI Solutions, contractor, or subcontractor site personnel will be given initial, PPE-specific training, which complies with this section. The UXOSO or the TLI Solutions Safety Officer, prior to personnel participation in site operations where PPE is required, will give this training. All personnel receiving PPE training will be required to demonstrate an understanding of the training topics and the ability to correctly use the PPE. This will be accomplished through the UXOSO supervising and visually inspecting the ability of each individual to properly don and use the PPE during initial use of the PPE.

Upon completion of the training and after each employee has successfully demonstrated the requisite understanding, the UXOSO will complete the “Documentation of Training” form (Attachment 4). This form identifies the employees who attended the training course and successfully demonstrated the required knowledge, the date(s) of the training and demonstration session(s), and the PPE covered by the training session.

10.6 EVALUATION OF PPE PROGRAM

Hazard/risk assessment is a continuing process; therefore, changes in the initial types and levels of PPE will be made in accordance with information obtained from the actual implementation of site operations and data derived from the site monitoring. The UXOSO will review periodically the on-site PPE program to ensure that the proper level of PPE is being utilized. If changes to operations on-site are encountered, the UXOSO will make a request for appropriate changes to the required level of PPE for activities on this site.

11.0 SAFETY PLANS, PROGRAMS, AND PROCEDURES

The SOW for this project is to safely identify the presence of MC and MEC at UBG, Sierra Army Depot. Due to planned site activities, there will be no tasks performed which will meet the requirements for the following plans; therefore, these plans will not be addressed in this APP:

- Layout plans
- Man overboard/abandon ship plan
- Hazardous Communication Program
- Lead Abatement Plan
- Asbestos Abatement Plan
- Abrasive Blasting
- Confined Space
- Hazardous Energy Control Plan
- Critical Lift Procedures
- Access and Haul Road Plan
- Demolition Plan
- Emergency Rescue (Tunneling)
- Underground Construction Fire Prevention and Protection Plan
- Compressed Air Plan
- Formwork and Shoring Erection and Removal Plans
- Jacking Plan (Lift) Slab Plans
- Blasting Plan
- Diving Plan
- Fall Protection Plan
- Steel Erection Plan
- Night Operations Lighting Plan

11.1 EMERGENCY RESPONSE PLANS

In the event of an on-site emergency the individual team leader or first person aware of the emergency will contact the SUXOS or UXOSO by 2-way radio or cellular phone. The UXOSO and/or the SUXOS will normally be responsible for requesting emergency services. The UXOSO and/or the SUXOS will contact the SIAD Emergency Operations Center to report all emergencies. If the order is given to evacuate the site of all personnel, each on-site team leader will assemble, account for, and evacuate all team personnel to the pre-designated staging area. The UXOSO or the SUXOS will initially instruct the on-site CPR/First Aid trained personnel to respond to the emergency. These individuals shall provide emergency first aid treatment and stay with the injured until relieved by off-site emergency services personnel. If possible, injured personnel will be moved to a safe, accessible area.

Prior to resuming on-site activities the UXOSO will ensure that sufficient emergency supplies are on hand to replace those used during the emergency and that on-site

emergency CPR/First Aid-trained personnel are on site, equipped, and prepared to respond. A critique of the emergency response actions taken will be initiated, with the results driven to look for flaws in the system and to improve on the emergency response.

11.1.1 Spill Containment Plan

Fuels and oils will not be brought to or stored at the project site; therefore, the probability of a spill is unlikely. However, the UXOSO will maintain and issue materials and equipment capable of containment and recovery of any spilled materials, if needed. Spill control materials and equipment will be staged at any location where fuel transfer will take place. Refer to appropriate Activity Hazard Analysis (AHA). In the event of a spill, the following procedures apply:

- Move injured personnel to a safe, accessible area.
- Notify the UXOSO and SUXOS immediately, who will notify the TLI Solutions PM
- The TLI Solutions PM will notify the United States Army Engineering and Support Center-Huntsville (USAESCH) MEC Safety Representative. The following relative information: location; time; chemical identity; quantity; MSDS; and any corrective actions/measures taken will be passed on.
- Locate the source and stop the leak/spill if it can be done safely, as dictated by the UXOSO
- Begin containment and recovery of spilled material, as directed by the UXOSO, using appropriate PPE and spill clean-up equipment and materials

11.1.2 Fire Prevention and Response Plan

11.1.2.1 Fire Prevention

Employees will be instructed on basic fire prevention and protection steps to include:

- No smoking will be allowed except at designated break areas clear of dried grasses and other vegetation on site
- A designated cigarette butt container will be provided
- Smoking and cell phone and/or radio use are prohibited during fueling operations
- Motor vehicles or other internal combustion engine equipment where the exhaust system is at the level of tall dried grasses and other vegetation will not be left running
- Vegetation removal will be conducted as needed to eliminate the potential for fires related to the previous bullets
- Fire extinguishers will be available on-site and employees will follow steps outlined in this document
- Fuel will be stored in approved containers only
- Equipment will be allowed to cool for 5 minutes before fueling

11.1.2.2 *Small Fires*

A small fire is defined as a fire that can most likely be extinguished by site personnel using minimum of a 1A:10B:C portable fire extinguisher. The decision on whether or not to try to extinguish a fire using available site personnel and equipment will be made by the UXOSO and based on whether the fire is small, large, or involves explosives. The following actions shall be taken in the event of a small fire:

- The UXOSO or SUXOS shall be notified immediately. The UXOSO/SUXOS will notify the USACE On-site Safety Specialist, if present
- All unnecessary personnel shall be evacuated to an upwind position
- Personnel shall attempt to extinguish the fire from an upwind position
- The UXOSO/On-site Incident Commander will request any emergency response services if needed from the SIAD Emergency Operations Center (EOC)
- All personnel shall be prevented from fighting a fire if explosive materials may be involved
- After the fire has been extinguished, the area in and around where the fire occurred must be watched for a minimum of 30 minutes to ensure that re-ignition does not occur. If personnel are not working in the area, the UXOSO should check the area of the fire periodically.

11.1.2.3 *Large Fires*

In the event that a large fire occurs or a small fire cannot be extinguished, the following actions shall be taken:

- The UXOSO and/or SUXOS shall be notified immediately; they will notify the USACE On-site Safety Specialist, if present or SIAD EOC
- All unnecessary personnel shall be evacuated to an upwind position
- The UXOSO/On-site Incident Commander shall request the local emergency response services necessary to handle the situation from SIAD Fire Department
- The UXOSO/On-site Incident Commander will direct personnel to move vital equipment/supplies from the fire's path only if this can be accomplished safely
- Immediately available resources should be used as much as possible to fight the fire
- No personnel shall attempt to fight a fire that may involve explosive materials
- The UXOSO shall warn responding personnel of the location(s) of any known hazard(s) (i.e., UXO, flammable materials, etc.)

11.1.2.4 *Fires Involving Explosive Materials*

If a fire involving explosive materials (such as chemicals, fuels or UXO/MEC) occurs, the UXOSO/On-site Incident Commander will order the immediate evacuation of all site personnel to an upwind assembly point (designated during the daily morning tailgate safety briefing). At no time will TLI Solutions personnel fight a fire involving explosive materials. The on-site USACE Safety Specialist will be advised of the situation and the

requirement that fire fighting personnel should not enter any closer than the locally established minimum separation distance (MSD) for SIAD. Fire fighters may spray water on surrounding buildings, structures, etc., in order to prevent the spread of fire. Cellular phones will not be used around Flammable Liquids (in accordance with OE Safety Group Safety Advisory 03-2003).

After the fire has burned itself out, the site must be barricaded and entry prohibited until adequate cooling time has passed. The cool-down period should be a minimum of 24 hours. Explosive materials that may not have discharged during the fire may still be liable to function in the presence of extreme heat. After the site has cooled down, the SUXOS and UXOSO will inspect the site and the condition of any UXO/MEC involved in the fire. They will make the determination as to whether or not the site is safe for others to enter.

If UXO/MEC is still intact, the location of the item will be marked with flagging ribbon and as a waypoint with the global positioning system (GPS) instrument. Non-UXO/EOD personnel will be prevented from going into the area. The UXO will be reported to Susan Holliday, SIAD Environmental Office, who will request EOD support. If an item is found on one of the off-post properties, local law enforcement and/or BLM personnel will be contacted for appropriate action.

If non-UXO qualified personnel must enter the site for purposes of fire investigation, they must receive a briefing on the potential hazards of UXO on the site. They must be accompanied, at all times, by a UXO qualified individual. No outside personnel will be permitted on-site while there is a known UXO/MEC hazard present.

If, during the course of the investigation, UXO/MEC is observed, the site will be evacuated of all non-UXO qualified personnel until the site can be rendered safe for re-entry.

11.1.3 Emergency Contacts

Table 2 provides an emergency contact list for the Upper Burning Ground, Sierra Army Depot, Sampling, Analysis, and Survey project. This will be posted in all site vehicles.

**Table 2: Emergency Contact List
Sierra Army Depot, California**

Service/Point of Contact	Agency	Telephone Number
Ground and Air Ambulance		911
Sierra Army Depot Medical Center		(530) 827-4141
Lassen Community Hospital	Local Medical Center	911 or (530) 257-5325
National Poison Control Center		(800) 942-5969
Centers for Disease Control	http://www.cdc.gov/health/diseases.htm	(800) 311-3435
Lassen County Health Department		(530) 251-8183
Sierra Army Depot Police Department		911 or (530)-827-4345
Mr. Larry Gallegos	SIAD Safety	(530) 827-4405
Lassen County Sheriff/Coroner Office		911 or (530) 251-8013
Mr. Gene Barber	TLI Solutions Project Manager	(303) 763-8881 or (303) 520-7514 cell
Mr. Jerry Glance	TLI Solutions UXO Safety Officer	(916) 761-0399
Mr. Dave Ahlborn	Earth Tech Site Project Manager	(909) 213-1587
Mr. Earl Dennis	Earth Tech SUXSO	(909) 782-6350
Mr. Jeff Fontana	Bureau of Land Management	(530) 252-5332
Ms. Susan Holliday	Sierra Army Depot Environmental Office/POC	(530) 827-4205
Sierra Emergency Operations Center		(530) 827-4345
Sierra Fire Department		(530) 827-4345
Installation Operator	Sierra Army Depot	(530) 827-2111
Dr. Phil Williams	TLI Solutions Health & Safety Officer	(706) 542-0606
Ms. Cynthia Braun	Braun Safety Associates, LLC	(303) 933-9028
Ms. Betina Johnson	USAESCH	(256) 895-1174
Ms. Young Chong	USACE – Sacramento Project Manager	(916) 557-7212
		(916) 557-5357
		(916) 557-7313
Mr. David Johnson	USACE-Sacramento CESPCK-SO	(916) 557-6973
CHEMTREC		(800) 424-9300
USEPA National Response Center		(800) 424-8802

CHEMTREC = Chemical Transportation Emergency Center

EOD = Explosive Ordnance Disposal

USEPA = United States Environmental Protection Agency

USACE = U.S. Army Corps of Engineers

TLI Solutions = TLI Solutions, Inc.

11.2 RESPIRATORY PROTECTION PLAN

It is the responsibility of the UXOSO to ensure that all individuals performing activities on-site have and use personal protective equipment that will protect the employee from hazards. No respirator usage is anticipated for this SI. However, if respiratory protection is required because of an upgrade in PPE level, *OSHA 29.CFR 1910.134* and the TLI Solutions respiratory protection program requirements will be followed.

11.3 HEALTH HAZARD CONTROL PROGRAM

All operations, materials, and equipment have been evaluated to determine the presence of hazardous environments and the potential for release of hazardous or toxic agents into the work environment. An AHA, identifying tasks/practices and environments presenting a hazard, as well as recommended hazard control measures, is presented in Table 3 for the overall project and in Tables 4 through 10 for individuals tasks. Chemical hazards associated with UXO/MEC are identified in Attachment 1.

11.4 CONTINGENCY PLAN FOR SEVERE WEATHER

Inclement weather may necessitate ceasing site operations and the evacuation of personnel from the work area. Heavy precipitation, high winds, electrical storms, or cold damp weather may affect workers ability to function properly. The UXOSO shall be responsible for obtaining daily local weather advisories and ensuring that the SUXOS is informed of possible adverse forecasts. When inclement weather does occur, the procedures outlined below shall be followed.

11.4.1 Heavy Precipitation

The UXOSO shall be alert when the possibility of heavy precipitation is forecasted even if expected in distant areas from the work site. The UXOSO shall assess each work site to determine if the area is prone to flash flooding. Site operations shall be halted, equipment will be secured, and personnel shall withdraw to adequate shelter. The SUXOS will be responsible to determine when operations shall resume, after consultation with the UXOSO.

11.4.2 High Winds

High winds may create conditions that threaten the safety of workers. The UXOSO may determine that wind conditions are at a level that site operations shall be halted, equipment will be secured, and personnel shall withdraw to adequate shelter. The SUXOS will be responsible to determine when operations shall resume, after consultation with the UXOSO.

11.4.3 Electrical Storms

Electrical storms, with their associated lightning, present a significant hazard to site workers. The UXOSO shall be responsible for obtaining daily local weather advisories and ensuring that the SUXOS is informed of possible adverse forecasts. He will monitor local weather stations for electrical storm advisories. If a storm is within ten miles of the site, operations will be terminated. All workers will seek adequate shelter. If the UXOSO determines that it is unsafe to remain on site, they shall call for evacuation of the site. Once the storm is outside the ten-mile range of the work site, work may resume if all other factors are favorable.

11.4.4 Cold, Damp Weather

If project activities are extended through the late spring, early summer months, circumstances could present themselves where employees could be affected by freezing or nonfreezing cold injuries. Whenever you go into an environment that is less than your body temperature, you are exposed to a Cold Challenge. Cold weather can lower body temperature, resulting in impaired performance and cold injuries. When protection provided by clothing and shelter is inadequate, the body protects its temperature by reducing skin blood flow and by shivering.

The UXOSO will cover cold injury precautions and procedures with workers prior to the start of operations and as required during daily tailgates safety briefings as required by weather. Personnel shall monitor each other for signs of injuries resulting from cold weather/decreased temperatures. Supervisors and/or UXOSO will be notified immediately when workers show signs of cold weather injuries.

11.5 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

11.5.1 Introduction

The Drug-Free Workplace Act of 1988 set as a goal the elimination of the effects of illegal drugs in the workplace. Due to the inherently hazardous nature of the work performed by TLI Solutions personnel, the importance of creating and maintaining a safe, drug-free working environment is paramount. The performance of every employee must, at all times, support the company's mission to conduct site operations with a high level of productivity, reliability, judgment, and safety.

TLI Solutions maintains a commitment to provide reliable service to customers, and a safe and healthy work environment for its employees. While the vast majority of employees are not involved with illegal drugs or alcohol abuse, those who are involved in usage or trafficking, on or off the job, have an adverse impact on the work place and impair the ability to maintain a safe work environment that is free from the effects of drugs or alcohol. While TLI Solutions understands employees under a physician's care are required to use prescription drugs, abuse of prescribed medications will be dealt with in the same manner as the abuse of illegal substances.

As a term of employment, maintenance of these standards is expected of all employees, and all employees will refrain from the use, distribution, possession, manufacture, or dispensing of a controlled substance, and drug and/or alcohol abuse. Violation of this policy will result in administrative action and possibly, termination of employment. Recognizing that there may be employees who have a drug or alcohol problem, the Company stands willing to assist in the resolution of that problem and encourages employees to seek help through the Employee Assistance Program (EAP). This program may be of assistance to employees in the following ways:

Self-Referral - The employee recognizes the need for help and refers them self. It is the responsibility of each employee to seek assistance from the EAP before alcohol or drug problems lead to disciplinary actions. Once a violation of this policy occurs, subsequently using the EAP on a voluntary basis will not necessarily lessen disciplinary action.

Supervisory Referral - The supervisor recognizes an employee's need for professional help through behavioral or job performance changes and refers employee to the EAP.

11.5.2 Substance Use and Abuse Policy

Employee drug or substance testing/screening, conducted by TLI Solutions in support of this policy, will be conducted at no expense to the employee. The drugs/substances for which TLI Solutions may conduct testing includes, but are not limited to: amphetamines, barbiturates, cocaine metabolites, methadone opiates phencyclidine (PCP), and ethyl alcohol. As a matter of policy, TLI Solutions will strictly implement and enforce the policies listed below:

1. The illegal use, possession, sale, distribution, or manufacture of illegal drugs, narcotics, or controlled substances while on or off the job is strictly prohibited.
2. Illegal drug usage, whether on or off the job, may adversely affect an employee's job performance, jeopardize the safety of other employees, the public, and/or the reliability of the Company's operations, and is just cause for disciplinary action up to and including termination of employment.
3. If an employee reports to work in a condition giving a supervisor reasonable cause to suspect the influence of alcohol, the employee may be required to submit to a blood and/or urine exam, and if the test reveals that the employee is under the influence of alcohol, the employee may be subject to disciplinary action up to and including termination of employment.
4. If an employee reports to work in a condition giving a supervisor reasonable cause to suspect the influence of drugs, the employee may be required to submit to a blood and/or urine exam, and if the test reveals that the employee is under the influence of illegal drugs, the employee may be subject to disciplinary action up to and including termination of employment.
5. Any employee who may be undergoing medically prescribed treatment with a controlled substance that may limit the employee's ability to perform on the job, must report this treatment to the Human Resource Manager prior to beginning

work or when the person begins treatment with the controlled substance. Failure to report this to the Human Resources Manager shall be just cause for disciplinary action.

11.5.3 Prescription Medications

TLI Solutions project personnel may possess and use prescription medications and “over-the-counter” medications provided that all of the following apply:

1. The prescription medication has been prescribed by an authorized medical practitioner for the current use (within the past 12 months) of the employee in possession of the medication, and the medication is in its original container with a valid pharmacy label including the employee’s name and the physician’s name.
2. The employee does not consume the prescribed or over-the-counter medication in quantities greater than, or more frequently than those prescribed by the container label.
3. Employees in possession of prescribed medications shall not allow any other person to consume any amount of their prescribed medication.
4. In the event that the prescribed or over-the-counter medication has side-effects or warnings that indicate possible side-effects that may impair or alter the employee’s ability to safely perform work, the employee shall inform the SUXOS and/or UXOSO prior to engaging in project operations while under the influence of the medication (i.e., having taken the medication within the past 12 hours).
5. The SUXOS and/or UXOSO and the employee’s “buddy” should monitor any employee that has, or is suspected to have taken a prescription or over-the-counter medication. Changes in the employee’s condition should be noted and reported to the SUXOS or UXOSO immediately.

While the on-site use of prescription and over-the-counter medications is authorized, under the requirements listed above, TLI Solutions reserves the right to have a licensed physician determine if the employee’s use of the medication could adversely affect the individual or increase the potential for injury or illness to the employee or other site personnel. If consumption of the medication could lead to adverse safety or health effects, the TLI Holdings Safety Office may, on the advice of the licensed physician, limit or suspend the employee’s work activities for as long as the licensed physician indicates that the medication may adversely affect the employee. Any employee who has been limited or suspended from work activities may seek from the prescribing physician a substitute medication that will not adversely affect the potential for injury or illness to the employee or other site personnel. If a suitable substitute can be prescribed, and is approved, the TLI Holdings Safety Office may lift the work activity suspension or limitation.

11.5.4 Suspicion Inspections and Testing

The intent of the guidelines is to provide managers, supervisors, and employees the necessary education, training, and information to administer the policy fairly,

consistently, and in accordance with this policy. If questions arise, the TLI Holdings Human Resources Manager should be contacted for guidance.

11.5.4.1 Suspicion Inspections

For the purposes of ensuring compliance with the prohibition against the unauthorized possession/use of controlled substances, employees will be subject to random and reasonable suspicion inspections and testing. An employee's company clothing, locker, closet, work area, desk files, company motor vehicle, and similar areas are subject to inspection. Similarly, an employee's privately owned vehicle, lunch box, and like containers are subject to such inspections when brought to any work site. At no time will an employee be physically touched during an inspection, and only outer clothing required to be removed for inspection or search. No person or property search (except for searches of TLI Solutions-owned, rented, or leased properties), urine drug test, or breathalyzer test will be conducted without the employee's consent. Refusal to submit to a legal inspection, or request for testing, will result in employee removal from participation in site activities until further inspection or testing can determine the potential for prohibited drug or substance use or abuse.

11.5.4.2 Drug/Alcohol Screening

Drug and alcohol screens may be administered only by a qualified laboratory or an approved physician. Random testing will be administered primarily to those employees in sensitive positions, but reasonable suspicion is grounds for any employee to be tested.

The employee may request that a steward be present to witness the screening process to ensure that the procedures for handling and testing of the sample are followed properly. Employees may request independent testing of the same sample by another laboratory approved by the State Department of Health and Mental Hygiene in order to verify the test results, at their own expense.

Drug screens may also be administered during a company physical.

Refusal to take a drug test will result in discharge.

A positive drug test will result in the Human Resources Manager informing the employee that there is a confirmed positive test. The employee will be given a phone number to call immediately for a counseling appointment at no cost to the employee. If the employee has failed to make an appointment within two working days, appropriate disciplinary action will be taken up to and including termination.

The counseling and referral service will determine during the initial appointment if a substance problem exists, and the extent of the problem. A determination will be made to refer the employee to an outpatient treatment, inpatient treatment, or no treatment indicated.

The employee will be allowed to use available accrued sick leave or authorized leave of absence while undergoing treatment.

Treatment programs are covered to a limited degree through the Company's health plan. The employee may apply for disability insurance during the period of treatment. Both kinds of insurance coverage are available to fully benefited employees only.

The Human Resources Manager will be provided with periodic updates on the treatment progress of the employee.

If the employee is referred to the inpatient treatment facility, their position (job) may be held open pending their return at the completion of the treatment program.

If the employee is referred to an outpatient program and allowed to remain on the job while undergoing rehabilitation, the Human Resources Manager may order the employee to be placed on administrative duties until sufficient rehabilitation has occurred. This order will be based on the severity of the substance dependency and consultation with the PM. Sufficient rehabilitation will be determined by the treatment center, and notification will be given to TLI Solutions in writing.

Following rehabilitation, treatment, and the employee's return to full duties, the employee may be subject to random testing by the employer based on reasonable suspicion.

A second positive test will result in the termination of employment.

11.5.5 Voluntary Treatment

Nothing in this program shall prohibit employees from voluntarily seeking counseling and treatment.

11.5.6 Drug Convictions

Any employee convicted of violating a criminal drug or alcohol statute will report in writing the facts surrounding the conviction and sentence to their immediate supervisor within five calendar days of the conviction. The supervisor will forward the written results immediately to the TLI Holdings Corporate Safety Office, TLI Solutions Human Resources, and the TLI Solutions PM, via the supervisory chain, and a written report of the conviction will be made within ten calendar days to all government agencies with which the company has contracts. Upon notification of conviction, the TLI Solutions Safety Office, TLI Solutions Human Resources, PM, and SUXOS will review the report and will, within thirty days after being informed, determine the disciplinary action to be taken. The disciplinary action taken may range from mandatory assignment to a rehabilitation program to termination of employment.

11.6 SITE SANITATION PLAN

Adequate sanitation facilities will be provided at each work site to ensure proper personal hygiene. Site sanitation will be established and maintained in accordance with *OSHA 29 CFR 1910.120(n)* and *USACE EM 385-1-1, Section 2*. In particular: Temporary toilet facilities will be provided in the work areas of the site. Chemical toilets will be used in these locations and will be serviced every week. Each temporary toilet will be naturally lighted, have a toilet seat with a seat cover, have a urinal, have ventilation with vents screened, and be lockable from the inside. There will be at least one toilet for every 15 workers at the work site.

Hand and face washing facilities will be set up at the TLI Solutions work site and will be utilized by all personnel exiting the OZ prior to eating, drinking, tobacco use, or other hand-to-face activities. Paper towels will be provided for drying. A trash receptacle will be provided for discarded paper towels. In accordance with *American National Standards Institute (ANSI) Z358.1-1998*, eyewash facilities will be available on the work site where operations in any of the work zones involve handling substances that could be hazardous to the eyes. An eyewash kit will also be available.

An adequate supply of drinking water will be provided on-site at all times. As there are no drinking water facilities on most areas of the site, water will be brought in coolers to the work areas of the site and supplied in accordance with the following provisions: Containers used for potable water will be capable of being tightly closed, equipped with a tap, and maintained in a clean and sanitary condition. A container used for distribution of drinking water will be clearly labeled as to its contents and not used for any other purpose. Water will not be dipped from the container, and use of a common cup will not be allowed. Where single service cups are provided, separate sanitary containers will be provided for the storage of the unused cups and for the disposal of the used cups.

Outlets and storage containers for non-potable water, such as water for fire fighting or decontamination will be clearly labeled to indicate that the water is not suitable for drinking, washing, or cooking. There will, at no time, be a cross-connection between a system furnishing potable water and a system furnishing non-potable water.

Housekeeping and Waste Disposal Procedures:

1. A clear path of entry/exit to the work site will be prepared and maintained.
2. All equipment and working surfaces will be cleaned and decontaminated after contact with blood or other potentially infectious materials.
3. Contaminated work surfaces and equipment will be decontaminated with an appropriate disinfectant as soon as possible after they become contaminated, in accordance with the decontamination section of this program.
4. Regulated biohazard waste will be placed in containers, which are capable of being sealed, constructed to contain all contents and prevent leakage, properly labeled or color-coded, and closed prior to removal or replacement. Labels or

- color-coding will be fluorescent orange or orange-red and display the biohazard symbol in a contrasting color.
5. Contaminated clothing, equipment, and other materials will be handled as little as possible and with minimum agitation. Bags containing contaminated materials will not be carried or handled from the bottom.
 6. All regulated waste will be disposed of in accordance with applicable federal, state, and local regulations.

11.7 FIRE PREVENTION PLAN

The fire extinguishers listed below will be positioned at the locations specified to ensure their availability to fight fires on site. Fire extinguishers will be stored where they are well marked and readily accessible. Fire extinguishers shall be protected from the damaging affects of environmental elements. The UXOSO is responsible to ensure that all fire extinguishers are visually inspected monthly and that these inspections are documented. All site personnel will be familiar with the locations of fire extinguishers and will be trained in their use.

All vehicles shall be equipped with a fire extinguisher rated at not less than 1A:10B:C. All vehicles used in the transportation of flammable and/or explosives materials shall be equipped with two fire extinguishers rated at not less than 2A:10B:C or higher. One fire extinguisher shall be mounted or placed inside the cab of the vehicle and one mounted outside, by the driver's door.

11.8 ORDNANCE AND EXPLOSIVES PLANS

11.8.1 UXO Safety Work Practices

All UXO/MEC operations will be conducted in accordance with the requirements of the *U.S. Army Corps of Engineers, EP 385-1-95a, Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations (27 August 2004)*.

Plans are to be based upon the minimum number of personnel, exposed for the minimum amount of time, to the minimum amount of UXO consistent with efficient operations and maximum safety. Only those personnel absolutely necessary to the operation will be allowed in the OZ during UXO activities.

All personnel engaged in UXO operations will be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures. Only personnel who are U.S. citizens and graduates of one of the schools or courses outlined in *DDESB TP-18* are authorized to handle UXO; however, for purposes of the SI, no personnel are permitted to handle or move UXO items.

All non-UXO-qualified personnel will follow the safe work practices listed below:

1. Non-UXO-qualified personnel will receive site-specific UXO recognition training prior to participation in site activities.
2. No soil-penetrating activities will be allowed without the area first being cleared by UXO-qualified personnel.
3. Non-UXO-qualified personnel will be escorted on-site by UXO qualified personnel, until such time as the area is cleared.
4. Non-UXO-qualified personnel will not touch or disturb any fused object that could potentially be UXO/MEC related, and will immediately notify the nearest UXO-qualified person of the presence of the object.
5. The greatest hazard to a UXO technician is complacency. It is imperative that team members are constantly reminded of the inherent dangers associated with UXO. This will be accomplished at the Tailgate Safety Briefings.
6. No UXO will be destroyed until it has been positively identified. Any destruction of UXO will be addressed by the local EOD direct support unit for SIAD.
7. If an MEC item cannot be identified by a site UXO Technician or SUXOS, mark the location with the GPS instrument and flagging ribbon. Report the item to the on-site USACE Safety Specialist, if present, who will request EOD support.
8. Although there is no evidence to support any use of Chemical Warfare Material (CWM). Should a suspected toxic chemical munition be found, mark the immediate area upwind of the munition with flagging ribbon and GPS the item's location. Evacuate team personnel to a safe area upwind of the item. Report the item location to the SUXOS and the on-site USACE Safety Specialist, if present, who will request EOD support.
9. Do not handle, use, or remain near explosives during the approach or progress of an electrical storm (within 10 miles), sandstorm, dust storm, snowstorm, or during any limited-visibility condition. All personnel should return to the site vehicles, or a site office until the storm has passed.
10. Areas requiring intrusive activities must be checked with a magnetometer prior to digging.
11. In the event of an incendiary fire, immediately evacuate the area. Do not attempt to use water as this may produce a violent reaction or be completely ineffective. If the incendiary fire is extremely small, sand may be used to smother the fire.

11.8.2 UXO Escort Procedures

All non-UXO qualified personnel requiring access to the project work sites must be escorted by the PM or SUXOS. Each individual requiring escort will sign the Visitor Log and receive the Visitor Site Safety Briefing from the UXOSO. Since there is a potential for unrecovered UXO/MEC within the project site, all visitors will be escorted and within sight at all times.

Geophysical teams will be accompanied by a UXO Technician at all times while working in the project area. The UXO Technician will maintain, at a minimum, visual contact with geophysical team members at all times while working in the project work zone.

11.8.3 Anomaly Avoidance

All project personnel will conduct continuous visual surface sweeps of all support zones, staging areas, and access routes to support soil sampling and visual and geophysical investigation activities.

A UXO technician will escort all field teams during visual surveys, geophysical surveys, and soil sampling activities. Hand-held electromagnetic (EM) devices will be used to enhance visual sweep procedures and to identify potential MEC items to ensure worker safety. Transect courses will be tracked using a hand-held GPS instrument. If GPS initialization is lost or horizontal error exceeds acceptable accuracy due to lack of satellites, poor radio link to the base, or poor satellite geometry, visual survey activities will cease until the issue is resolved. Any munitions-related materials discovered will be marked as GPS waypoints and recorded in a field log. Digital photographs will be taken of any identified munitions-related material. No UXO/MEC removal actions will be conducted as part of this survey. In the event a UXO item is discovered the SUXOS will be notified and will verify the type of munitions, and fuze type by function and condition. This information will be reported to the UXOSO and the TLI Solutions PM who will notify Susan Holliday, SIAD Environmental Office, who in-turn will notify the local EOD support unit for appropriate action. If a UXO item is discovered on off-installation property, the SUXOS will notify local law enforcement agencies, as well as Ms. Holliday. Appropriate action for addressing the UXO item will be determined by the local law enforcement agency.

Soil sampling procedures will be conducted after the sample site has been determined to be clear of anomalies. Soil samples will not be collected until a UXO Technician has checked the sampling site with a magnetometer. Once the intended soil sample site has been determined to be clear of anomalies, the sample will be collected.

11.8.4 Explosions

In the event of an explosion, all non-essential site personnel will be evacuated to a safe, upwind assembly point outside the OZ. All personnel will be accounted for along with any injuries resulting from the incident. The UXOSO/On-site Incident Commander, the SUXOS, and the USACE On-site Safety Specialist, if present, shall be notified immediately of the situation and be provided with situation updates as they occur. The UXOSO/On-site Incident Commander shall request the emergency response services from SIAD if on-installation or call 911 for off-installation support. After an explosion has occurred, the site will remain barricaded for a minimum of 30 minutes before re-entry is permitted. The SUXOS and the UXOSO will enter the site and inspect for the presence and condition of UXO/MEC.

If UXO/MEC is still intact, the location of the item will be marked with flagging ribbon and as a GPS waypoint. Non-UXO/EOD personnel will be prevented from going into the area. The UXO will be reported to Ms. Susan Holliday, SIAD Environmental Office,

who will request EOD support. If an item is found on one of the off-post properties, local law enforcement and/or BLM personnel will be contacted for appropriate action.

11.8.5 Chemical Warfare Material

It is not anticipated that CWM will be encountered at Upper Burning Ground, SIAD. However, if CWM is encountered during any phase of site activities, personnel shall immediately cease all activities, withdraw upwind from the work area; mark the approximate location as a GPS waypoint. Project personnel will withdraw along cleared paths upwind from the discovery. A team consisting of a minimum of two personnel will secure the area to prevent unauthorized access. Personnel should position themselves as far upwind as possible while still maintaining security of the area. The SUXOS will notify the USACE On-site Safety Representative, if present, and the Sierra Army Depot Environmental Office to request EOD response and coordinate site security until the arrival of the EOD unit.

11.9 MATERIAL HANDLING PROCEDURES

Many types of objects are handled in normal day-to-day operations. Care will be taken in lifting and handling heavy or bulky items because they are the cause of many joint and back injuries. The following fundamentals address the proper lifting of materials to avoid joint and back injuries:

1. The size, shape, and weight of the object to be lifted must be considered. Site personnel will not lift more than they can handle comfortably.
2. A firm grip on the object is essential; therefore, the hands and object should be free of oil, grease, and water.
3. The hands, and especially the fingers, will be kept away from any points that may cause them to be pinched or crushed, especially when setting the object down.
4. The item will be inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces, and pinch points, and leather gloves will be used to protect the hands.
5. The feet will be placed far enough apart for good balance and stability.
6. Personnel will ensure that solid footing is available prior to lifting the object.
7. When lifting, get as close to the load as possible, bend the legs at the knees, making sure that the back is kept as straight as possible.
8. To lift the object, the legs are straightened from their bending position.
9. Never carry a load that cannot be seen over or around.
10. When placing an object down, the stance and position are identical to that for lifting, with the back kept straight, the legs bent at the knees, and the object lowered.
11. If the item to be lifted is too large, bulky, or heavy (over 40 pounds) for one person to safely lift, ask a co-worker for assistance. If a piece of material handling equipment is available that can do the job, the employee should use the equipment instead of trying to lift the object himself/herself.
12. 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 will face the direction in which the object is being carried, if possible.

12.0 SITE-SPECIFIC HAZARDS AND CONTROLS

12.1 SITE SECURITY AND CONTROL

12.1.1 Site Access Control

Site access control will be implemented by the SUXOS and will be accomplished through a program that limits movement and activities of people and equipment at the project site.

Site control procedures will be modified by the SUXOS if site conditions change during operations or a breach of the system occurs which would indicate more stringent controls are necessary.

Site access control will be based on site-specific characteristics including:

- Potential physical or explosive hazards
- Expected weather conditions
- Planned site activities
- Site proximity to populated areas

12.1.2 Site Security (Physical and Procedural) Description

Physical Site Security: Installation control consists of strict base perimeter controls including a security fence to prevent unauthorized access and guarded gates.

Procedural Site Security: The field team will coordinate with Ms. Susan Holliday to gain access to Upper Burning Ground, SIAD. No one will be allowed to carry contraband, alcohol, or firearms into SIAD.

General Site Access Description: Area access will be coordinated with Ms. Holliday or a designee.

12.1.2.1 Worker/Visitor Registration

The UXOSO will be responsible for logging in/out all personnel who enter the OZ. Visitors will receive a safety briefing outlining the potential hazards, control measures, limits of site, access to the site, and emergency procedures.

The on-site USACE MEC Safety Specialist, if present, will be notified of all personnel entering into the work area.

12.1.2.2 Escort of Visitors

A UXO-qualified individual will escort visitors into an OZ at all times.

12.1.2.3 PPE Requirements

All workers and visitors entering into the OZ will wear all PPE required for that site.

12.1.3 Work Zones

In order to control site access, site work zones will be established by the UXOSO prior to initiating operations. Establishment of site work zones will be based upon site conditions, activities, and exposure potentials. Whenever possible, site work zones will be clearly marked using placards or signs and enclosed using hazard tape, ropes, chains, or fences. The UXOSO will control access to each work zone and will ensure that all site workers and visitors have received the proper training and medical surveillance required before entering a specific zone. Access will be denied to any potential entrant not meeting these requirements.

12.1.3.1 Operational Zone

The OZ boundaries will be established for the work site UXOSO. This is the area where hazards or contamination could exist and will include all areas where PPE is required to control worker exposure to physical hazards.

12.1.3.2 Support Zone

The Support Zone (SZ) is the area outside the OZ where site support activities are conducted. This zone includes the break areas.

Persons desiring entrance into the OZ must first meet with the UXOSO and receive the appropriate safety briefing in the SZ before gaining admittance to the OZ.

The UXOSO, in conjunction with the SUXOS, will identify various staging areas for the site work areas. These staging areas will be identified on the site map and will be communicated each morning to workers during the daily tailgate safety briefings. In the event of the need to suspend operations and evacuate the work site, all personnel will proceed to the staging areas where personnel shall be accounted for.

12.1.3.3 Site Maps

Site maps will be used by the UXOSO during the Tailgate Safety Briefings to inform the workers of the location of barricades and warning signs going into the OZ.

12.1.4 Communication

12.1.4.1 On-Site Communications

Effective on-site and off-site communication is an integral part of site control and will be established prior to initiating site activities. All site personnel need to be familiar with the methods of on-site and off-site communication.

On-site communication will be used to coordinate site operations, maintain site control, and pass along safety information, such as monitoring results and work/rest periods, and alert site personnel to emergency situations. The methods of on-site communications shall be cellular telephone, hand-held radios, and hand signals.

The SUXOS, UXOSO, and individual team leaders will utilize cellular telephones and/or hand-held radios to maintain communications with personnel on site.

Upon mobilization to the site, SUXOS and UXOSO will establish the on-site communication system.

- Team leaders and site personnel (SUXOS, UXOSO) should be issued cellular telephones, hand-held radios along with a list of contact numbers, and call signals of on-site personnel
- On-site personnel assigned communication equipment shall perform daily communication checks to the SUXOS
- On-site communications will be checked at a minimum:
 - At the start of each workday upon teams reaching their area of activities
 - After the mid-day break, when work resumes
- At any time that communications with the SUXOS or UXOSO cannot be maintained, the on-site team shall stop all activities until communications are re-established

12.1.4.2 Hand/Audible Signals

Site personnel will be familiar with the following hand and audible signals:

- Hand gripping throat: **“Breathing problem,” “I can’t breathe”**
- Thumbs up: **“OK,” “I’m all right,” “I understand”**
- Thumbs down: **“No,” “Negative,” “I don’t understand”**
- Pointing to ear(s): **“Can’t hear”**
- Waving hand(s) over head: **“Need assistance now,” “Help”**
- Pointing to eyes then pointing to a person/object: **“Watch person/object closely”**
- Grab buddy’s wrist: **“Evacuate site now, no questions”**
- One long horn/siren blast: **“Evacuate site to assembly point”**
- Two short horn/siren blasts: **“Condition under control, return to site”**

12.1.4.3 Off-Site Communication

Off-site communication is required to ensure effective communication with off-site management, USACE personnel, and Emergency Services personnel. The cellular telephone will be the method used to conduct off-site communications.

12.1.5 Personnel and Equipment Decontamination

Hazardous and toxic wastes are not anticipated during activities under the SOW. Based on the Historical Records Review and previous activities conducted at the site, radiological materials and CWM are not expected within the SI project areas. Therefore, related decontamination procedures are not applicable. Proper sampling and handling procedures will be followed at selected sampling locations; nitrile gloves will be properly discarded.

12.1.5.1 Personnel Decontamination

A program for the decontamination of on-site workers is not an anticipated requirement during activities under the SOW. Nitrile gloves used for soil sampling will be properly discarded. Every TLI Solutions employee and site visitor will take normal personal hygiene precautions during activities being conducted on-site.

Adequate sanitation facilities will be provided at each work site to ensure proper personal hygiene. Site sanitation will be established and maintained in accordance with *OSHA 29 CFR 1910.120(n)* and *USACE EM 385-1-1, Section 2*.

All personnel will use the provisions outlined on-site for personal hygiene requirements.

If site conditions change or unanticipated hazardous contamination is encountered, work will be suspended, the on-site USACE safety representative will be notified, if present, and the appropriate procedures will be developed and submitted for approval before work is resumed.

12.1.5.2 Equipment Decontamination

Based on the SOW and previous activities conducted at the site, radiological materials and CWM are not expected within the project area. Therefore, related decontamination procedures are not applicable.

The analysis of hazards of concern presented by each task, under work to be performed at the sites, does not reflect the requirement for equipment decontamination at this time except for the cleaning of sampling tools. This will be done in such a way as to prevent the cross-contamination of samples.

If site conditions change or unanticipated hazardous contamination is encountered, work will be suspended; the on-site USACE safety representative, if present, will be notified;

and the appropriate procedures will be developed and submitted for approval before work is resumed.

General decontamination procedures that might apply to a given situation include:

- All equipment, working surfaces, and non-working surfaces will be decontaminated after contact with potentially infectious materials. A solution of 10 parts water to 1 part bleach, or equally effective material, will be used to clean contaminated areas. Infectious materials may be categorized as poisonous flora and, based on past use of these areas, the potential for explosive constituent soil contamination.
- All cleaning equipment will be disinfected or disposed of in accordance with this section; for minor injuries where the employee is able to return to work, the injured employee will clean up his/her own blood or other potentially infectious materials

12.1.6 Emergency Response

During an emergency, site security and control will be paramount to control any possibility of negative effects on the public. Upon notification of an emergency, each Team Leader (UXO Technician III) will be responsible for accounting for and evacuation of their team personnel to the Staging Area. Once the team has evacuated, the Team Leader will report its completion to the UXOSO, acting as the On-site Incident Commander. At that time the Team Leader will ensure that personnel not authorized by the On-site Incident Commander are not allowed access into the OZ. If TLI Solutions personnel are needed for other response actions, the On-site Incident Commander will request assistance from the USACE On-site Safety Specialist, if present. The USACE On-site Safety Specialist will then request security and access control services from the local police or sheriff department.

12.1.6.1 *Emergency Alerting*

It is the responsibility of the SUXOS to ensure that adequate on-site and off-site communications are available at all times. At any time that communications between individual teams and the SUXOS or UXOSO, or off-site emergency services are lost, field operations shall be suspended until communications are re-established. The telephone numbers for all emergency services and points of contact are listed in Table 2 (in Section 11.1.3). During field operations a copy of emergency contact numbers will be kept in the visor above the driver's seat. All site personnel shall be briefed daily on the procedures for obtaining off-site emergency services.

12.1.6.2 *Evacuation Routes and Procedures*

In the event of an emergency that requires evacuation of the site, an alarm will be sounded or verbal instruction given by the UXOSO to evacuate the area to the work site

Staging Areas. This point will be established outside the work area Maximum Fragmentation Range. Personnel will be shown the location of the staging areas daily, during the Site Safety Briefing. The location of the assembly point may change as work activity progresses within the project area.

After evacuation, the UXOSO will account for all personnel, ascertain information about the emergency, and advise responding on-site personnel. The UXOSO will contact, advise, and coordinate with responding off-site emergency personnel, if deemed necessary by the situation or the client Safety and Health Representative.

In all situations that require evacuation, personnel will not re-enter the work area until the conditions causing the emergency have been corrected; the hazard reassessed; the APP has been revised and reviewed with on-site personnel, if needed; and instructions have been given for authorized re-entry by the UXOSO.

12.2 PROJECT ACTIVITY HAZARD ANALYSIS

Individual hazard analyses have been performed for each major task at this project site. Table 3 lists the tasks, operations, and their associated hazards. The potential hazards have been identified, control measures have been outlined, training and PPE requirements have been established, and equipment inspection procedures have been established. Should new operations be introduced to this site, the TLI Holdings Corporate Safety Office will perform a hazard analysis. Should operations change significantly during the course of this project, the hazard analysis will be updated to accommodate these changes. The TLI Holdings Corporate Safety Office will approve any changes in PPE or safe operating procedures. As stated in the Work Plan, approval of such changes shall be requested, in writing, to the government's Contracting Officer prior to implementing any changes.

The hazard analyses performed for this project include the following activities presented below and in the noted tables. It should be noted that these tables provide general information and the UXOSO should be consulted for more specific information as needed.

- Table 3: Project Activity Hazard Analysis
- Table 4: Location, Survey, and Mapping Operations
- Table 5: Performing UXO/MEC Inspection Activities
- Table 6: Performing Quality Control Activities
- Table 7: Performing Motor Vehicle Operations
- Table 8: Operating Geophysical Instruments
- Table 9: Avoiding UXO/MEC at Sample Locations
- Table 10: Performing Sampling and Analysis Activities

12.3 SAFETY HAZARDS

Due to the nature of planned site operations, the potential risk for exposure to safety hazards is minimal. Anticipated safety hazards that may be encountered during site activities and their associated precautions are listed below and in individual Activity Hazard Analyses. The tables provided below are intended to provide general information. Team members are directed to meet with the UXOSO or other appropriate personnel for more information, as needed.

12.3.1 Slips, Trips, and Fall Hazards

Site conditions consist of light to moderate terrain, significant rocks, and hills, which make the possibility of slips, trips, and fall hazards high during the UXO escort, surface sweep, and quality control activities. Site personnel shall be instructed to make themselves aware of the placement of their feet at all times to avoid site conditions, which attribute to slips, trips, and falls. The use of sturdy leather work boots or hiking boots with ankle support and non-slip soles will reduce the risk of slips, trips, and falls.

12.3.2 Inclement Weather

High winds are only considered hazards if they impair an individual's ability to conduct operations (i.e., reduced visibility to see work area). Personnel will not continue operations if visibility is greatly affected or if traversing the areas targeted for sampling becomes too difficult to safely continue operations. The UXOSO will make recommendations to the SUXOS to determine risk hazards. Thunder/lightning storms are a high-risk hazard to all site personnel, especially those using magnetometers. Site personnel, in the open, are at great risk and shall be moved to safe sheltered locations until the storm has passed.

12.4 CHEMICAL HAZARDS

Historical records and installation personnel do not indicate that chemical warfare material has been used at Upper Burning Ground, Sierra Army Depot. Therefore hazards associated with CWM are not anticipated on any of the three MR sites identified under the scope of this SI.

The Explosive Ordnance related chemical hazards associated with MC at the Upper Burning Ground Sierra Army Depot MR sites are listed in Attachment 1.

Table 3: Project Activity Hazard Analysis

Task	Operation	Hazards
Location, Survey, and Mapping Operations	<ul style="list-style-type: none"> • Escort Land Surveyors to conduct survey activities • Use a hand-held electromagnetic (EM) device to ensure there are no anomalies where survey stakes are to be driven or where soil samples will be taken • Drive marking stakes to mark the area corners 	<ul style="list-style-type: none"> • Slips, trips, and falls hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye hazards
Performing UXO/MEC Inspection Activities	<ul style="list-style-type: none"> • Thorough inspection of surface UXO/MEC items • Use of hand-held EM device to locate anomalies • Live UXO/MEC items will be marked and, if possible, a GPS location noted. EOD will be notified. 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye Hazards • Cuts and Abrasions Hazard
Performing Quality Control Activities	<ul style="list-style-type: none"> • Ensure there are no surface UXO/MEC anomalies • Ensure all sampling is conducted within the guidelines of the SOW • Investigate surface anomalies found 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye hazards
Performing Motor Vehicle Operations	<ul style="list-style-type: none"> • Inspect vehicles to ensure proper working condition • Ensure that vehicles are properly equipped • Conduct motor vehicle operations 	<ul style="list-style-type: none"> • Accident • UXO/MEC hazards when operating vehicle in work zones
Operating Geophysical Instruments	<ul style="list-style-type: none"> • Using a hand-held EM device to ensure there are no anomalies where stakes are to be driven or soil samples collected • Using geophysical detection instrument to assist in locating surface anomalies during surface investigation • If required, fiberglass pin flags will be used to mark UXO/MEC material for EOD 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye hazards

Table 3: Project Activity Hazard Analysis (concluded)

Task	Operation	Hazards
Avoiding UXO/MEC at Sample Locations	<ul style="list-style-type: none"> • Using a hand-held EM devise to ensure there are no anomalies where the soil samples are to be collected 	<ul style="list-style-type: none"> • Slips, trips, and falls hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye hazards • Cuts and abrasion hazards
Performing Sampling and Analysis Activities	<ul style="list-style-type: none"> • Collecting soil samples for analysis to determine need for further investigation • Cleaning of sampling tools if required, using appropriate method to prevent cross-contamination of samples 	<ul style="list-style-type: none"> • Slips, trips, and falls hazards • UXO/MEC hazards • Biological hazards • Heat/cold stress hazards • Eye hazards

Table 4: Location, Surveying, and Mapping Operations

Activity Hazard Analysis		
Activity: Location, Surveying, and Mapping Operations		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Escort Land Surveyors to conduct activities 2. Use a hand-held EM device to ensure there are no anomalies where stakes are to be driven and soil samples taken 3. Drive Marking stakes into the ground 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Cold and Heat Stress hazards • Eye hazards • Cuts and abrasion hazards • Arm, Leg, and Back strain from carrying equipment 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (UXO Technicians will not wear steel toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to follow if UXO/MEC/CWM is found on the surface • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold and heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site • Observe proper lifting techniques
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Hand-held EM device • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ leather gloves ○ over the ankle leather work boots or hiking boots (UXO Techs no steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests if required. • Survey equipment 	<ul style="list-style-type: none"> • All equipment inspected daily • Equipment will be calibrated according to manufacturer specifications and those established for detection equipment 	<ul style="list-style-type: none"> • Operators will be trained in the used of proper equipment, PPE, • UXO personnel are required to be graduates of one of the schools or courses outlined in <i>DDESB TP-18, Dated 20 December 2004</i> • All operators will be trained in performing field calibration tests of all metal detectors • Personnel will receive site specific training for UXO/MEC/CWM recognition for those items anticipated at the site • All operators will have OSHA/HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance

Table 5: Performing UXO/MEC Inspection Activities

Activity Hazard Analysis		
Activity: Performing UXO/MEC Inspection Activities		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Thorough inspection of UXO/MEC items found within sample area 2. Use a hand-held EM device to locate anomalies 3. Isolate and mark UXO/MEC found in area and notify EOD 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Cold and Heat Stress hazards • Eye hazards • Cuts and abrasion hazards 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (UXO Techs will not wear steel-toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to be followed if UXO/MEC/CWM is found on the surface • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold and heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site • Observe proper lifting techniques
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Hand-held EM device • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ leather gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 • Fluorescent orange safety vests (if required) 	<ul style="list-style-type: none"> • All PPE will be inspected prior to use 	<ul style="list-style-type: none"> • UXO personnel are required to be graduates of one of the schools or courses outlined in <i>DDESB TP-18, Dated 20 December 2004</i> • Personnel will receive site specific training for UXO/MEC/CWM recognition for those items anticipated at the site • All operators will have OSHA/HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance • Personnel will be trained in the used of proper equipment, PPE

Table 6: Performing Quality Control Activities

Activity Hazard Analysis		
Activity: Performing Quality Control Activities		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Ensure no surface UXO/MEC/MD or sub-surface anomalies exist in sampling area 2. Investigate discovered anomalies with SUXOS 3. Notify EOD of all UXO/MEC materials encountered 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Cold or Heat Stress hazards • Eye hazards • Cuts and abrasion hazards 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (UXO Techs will not wear steel-toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to be followed if UXO/MEC/CWM is found on the surface • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold or heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site • Observe proper lifting techniques
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ leather gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests (if required) 	<ul style="list-style-type: none"> • All PPE will be inspected prior to use 	<ul style="list-style-type: none"> • UXO personnel are required to be graduates of one of the schools or courses outlined in <i>DDESB TP-18, Dated 20 December 2004</i> • Personnel will receive site specific training for UXO/MEC/CWM recognition for those items anticipated at the site • All operators will have OSHA/HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance • Personnel will be trained in the used of proper equipment, PPE.

Table 7: Performing Motor Vehicle Operations

Activity Hazard Analysis		
Activity: Performing Motor Vehicle Operations		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Inspect vehicles to ensure proper working conditions 2. Ensure vehicles are properly equipped 3. Conduct motor vehicle operations 	<ul style="list-style-type: none"> • Accidents and collisions • Slips and falls when securing equipment 	<ul style="list-style-type: none"> • Complete Motor Vehicle Inspection Form. If the vehicle is not working properly it will be returned to the rental agency for repair or replacement. All operators are required to have a valid driver's license. The driver will observe all posted speed limits. The vehicle will have radio or telephone communications available in the vehicle • Drivers will maintain vehicles so there is no obstruction and blocking of windows and mirrors.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ leather gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests if required • Vehicle: seat belts, two-way radios or cellular phones, first aid kits, eye wash kit, BBP kit, one fire extinguisher rated at 1A:10B:C, Hazardous Material (HAZ-MAT) spill response kit, roadside emergency markers 	<ul style="list-style-type: none"> • Vehicles will be inspected daily prior to use • Any hazardous condition noted will be repaired prior to use • Inspect interior for equipment 	<ul style="list-style-type: none"> • Vehicles operators are required to have a valid driver's license from their state of residence • All operators and passengers will be trained in the use of fire extinguishers • Personnel will receive site-specific training for UXO/MEC/CWM hazards that may be found on site • All operators will have current OSHA HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance • Personnel will be trained in the used of proper equipment, and PPE.

Table 8: Operating Geophysical Instruments

Activity Hazard Analysis		
Activity: Operating Geophysical Instruments		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Escort Land Surveyors to conduct activities 2. Using a hand-held EM device ensure that there are no anomalies where stakes are to be driven or soil samples taken and fiberglass pinflags to mark a possible surface UXO/MEC item 3. Drive Marking stakes into the ground 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Cold and Heat Stress hazards • Eye hazards • Cuts and abrasion hazards • Arm, Leg, and Back strain from carrying equipment 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (Uxo Techs will not wear steel-toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to be followed if UXO/MEC/CWM is found on the surface; operators will not place a pinflag directly on a UXO/MEC/CWM item, but will place the pinflag to the side and away from the item. • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold or heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site • Observe proper lifting techniques • All Operators will have current OSHA HAZWOPER training • Employees working on-site will have HAZWOPER medical clearance
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Hand-held EM device • Time Domain EM mapping system with GPS • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ leather gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests (if required) 	<ul style="list-style-type: none"> • All equipment inspected daily • Equipment will be calibrated according to manufacturer specifications and those established for detection equipment • All PPE will be inspected prior to use 	<ul style="list-style-type: none"> • Operators will be trained in the proper use of equipment, and PPE. • UXO personnel are required to be graduates of one of the schools or courses outlined in <i>DDESB TP-18, Dated 20 December 2004</i> • Personnel will receive site specific training for UXO/MEC/CWM recognition for those items anticipated at the site • All operators will have OSHA/HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance • Personnel will be trained in the used of proper equipment, and PPE.

Table 9: Avoiding UXO/MEC at Sample Locations

Activity Hazard Analysis		
Activity: Avoiding UXO/MEC at Sample Locations		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Establish work area 2. Investigate sample locations for potential UXO/MEC/CWM material with a hand-held EM device 3. If UXO/MEC/CWM is located on the surface of the work area, terminate soil sampling efforts, mark location, move personnel to a new sampling location, and notify EOD 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazards • Biological hazards • Cold and Heat Stress hazards • Eye hazards • Cuts and abrasion hazards 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (UXO Techs will not wear steel-toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to be followed if UXO/MEC/CWM is found on the surface • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold and heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Hand-held EM device • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ nitrile gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests (if required) 	<ul style="list-style-type: none"> • All equipment inspected daily • Equipment will be calibrated according to manufacturer specifications and those established for detection equipment 	<ul style="list-style-type: none"> • Operators will be trained in the used of proper equipment, and PPE. • UXO personnel are required to be graduates of one of the schools or courses outlined in <i>DDESB TP-18, Dated 20 December 2004</i> • All operators will be trained in performing field calibration tests of all metal detectors • Personnel will receive site specific training for UXO/MEC/CWM recognition for those items anticipated at the site • All operators will have OSHA/HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance

Table 10: Performing Sampling and Analysis Activities

Activity Hazard Analysis		
Activity: Performing Sampling and Analysis Activities		
Principal Steps	Potential Safety / Health Hazards	Recommended Controls
<ol style="list-style-type: none"> 1. Collect soil sample 2. Screen samples for CWM 3. Cleaning of sampling tools 4. Disposal of sampling waste 5. Labeling of waste container 6. Preparing labels for shipping 	<ul style="list-style-type: none"> • Slips, trips, and fall hazards • UXO/MEC hazard • Biological hazards • Cold and Heat stress hazards • Eye hazards • Cuts and abrasions hazards 	<ul style="list-style-type: none"> • Personnel will be made aware of the area they will be working in and be instructed to be observant for obstacles which may present a trip hazard; they will wear slip resistant work boots or hiking boots with reinforced leather sides that extend above the ankle (Uxo Techs will not wear steel-toed boots) • Personnel will be trained to recognize UXO/MEC/CWM hazards and will be familiar with procedures to be followed if UXO/MEC/CWM is found on the surface • Personnel will observe all precautions for biological hazards • Personnel will observe all precautions for cold and heat stress including monitoring and hydration • Safety glasses rated ANSI Z87.1 will be worn on the job site • Hand protection will be worn by all personnel on the job site • Observe proper lifting techniques
EQUIPMENT TO BE USED	INSPECTION REQUIREMENT	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Level D PPE <ul style="list-style-type: none"> ○ work clothes ○ nitrile gloves ○ over the ankle leather work boots or hiking boots (UXO Techs will not wear steel toed boots) ○ Safety glasses rated ANSI Z87.1 ○ Fluorescent orange safety vests (if required) 	<ul style="list-style-type: none"> • Sampling equipment to be inspected daily and results noted in log book 	<ul style="list-style-type: none"> • Sampling technicians will be trained in the proper use of required sampling and monitoring equipment, and PPE. • Sampling technicians will receive site-specific training for UXO/MEC/CWM hazards that may be found on site • Sampling Technicians will have current OSHA HAZWOPER Training • Employees working on site will have HAZWOPER medical clearance

12.5 PHYSICAL HAZARDS

For the planned site activities to be conducted, the potential for exposure to physical hazards is high for this project. The physical hazards that may be encountered during site operations and precautions include Cold Stress and Flammable/Explosive Hazards from fueling and maintenance of site vehicles.

The chance of fire and/or explosion during vehicle refueling and maintenance is high when improper procedures are used. All site vehicles will be equipped with a portable fire extinguisher that is readily available to fight a fire. Equipment will never be refueled on the back of a pick-up truck with a bed liner. Cellular phones will not be used around flammable liquids (in accordance with *OE Safety Group Safety Advisory 03-2003*).

12.5.1 HEAT AND COLD STRESS

The UXOSO will review conditions with site personnel that would modify an individual's susceptibility to heat/cold-induced stress. They will ensure that such individuals have the opportunity to modify or refrain from activities that would put themselves at risk. The work is tentatively scheduled to begin in July 2007. Cold stress is not anticipated to be a potential concern during field activities; however, cold stress information is provided below should it be of concern.

Prior to initiating site activities each day, and periodically throughout the day, the UXOSO will inspect the site personnel for evidence of heat/cold-related illnesses. Evidence of extreme dehydration, illness, or drug or alcohol use may require the UXOSO to restrict the worker's activities until such time as the worker is fit for duty. Personnel identified as being at high risk for cold and heat stress, who are allowed to participate in site operations, will be monitored frequently by the UXOSO.

For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 75 °F, the UXOSO will check current weather conditions online periodically throughout the day and interpret the conditions by use of the Cal OSHA Heat Index Chart. This information combined with observation will be used to assist in controlling the potential for site workers experiencing heat related adverse health effects. Table 11 below, identifies the Permissible WBGT Heat Exposure Threshold Limit Values and recommended work/rest cycles.

Heat Index (Apparent Temperature) Chart

The **Heat Index (HI)** is the temperature the body feels when heat and humidity are combined. The chart below shows the HI that corresponds to the actual air temperature and relative humidity. (NOTE: This chart is based upon shady, light wind conditions. **Exposure to direct sunlight can increase the HI by up to 15°F.**) (Due to the nature of the heat index calculation, the values in the tables below have an error of +/- 1.3F.)

Heat Index	General Effect of Heat Index on People in Higher Risk Groups
80 to 89° - Caution	Fatigue possible with prolonged exposure and/or physical activity.
90 to 104° - Extreme Caution	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
105 to 129° - Danger	Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
130° or higher - Extreme Danger	Heat/sunstroke highly likely with continued exposure.

		Relative Humidity (in percent)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Air Temp (in F)	140	125																				
	135	120	128																			
	130	117	122	131																		
	125	111	116	123	131	141																
	120	107	111	116	123	130	139	148														
	115	103	107	111	115	120	127	135	143	151												
	110	99	102	105	109	112	117	123	130	137	143	150										
	105	95	97	100	102	105	109	113	118	123	129	135	142	149								
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
	90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
	85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
	80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72	

		Dew Point (in F)																									
		60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
Air Temp (in F)	104	110	110	110	110	110	111	112	113	114	115	116	117	118	119	121	122	124	125	127	128	130	132	133	136	137	
	102	108	108	108	108	108	109	110	110	111	112	113	114	116	117	118	119	121	122	124	126	127	129	131	133	136	
	100	106	106	106	106	106	106	107	108	109	110	111	112	113	114	115	117	118	119	121	123	124	126	128	129	132	
	98	103	103	103	103	103	104	105	105	106	107	108	109	110	111	113	114	115	117	118	120	121	123	125	127	129	
	96	101	101	101	101	101	101	102	103	104	105	106	107	108	109	110	111	112	114	115	117	118	120	122	124	127	
	94	98	98	98	98	98	99	100	100	101	102	103	104	105	106	107	108	109	111	112	114	115	117	119	122	124	
	92	96	96	96	96	96	96	97	97	98	99	100	101	102	103	104	105	106	108	109	110	112	114	116	119	121	
	90	94	94	94	94	94	94	95	95	96	97	98	98	99	100	101	102	103	105	106	107	109	110	113	116	117	
	88	88	88	88	89	89	90	90	90	91	92	93	94	95	96	97	98	99	100	101	103	104	106	108	110	114	
	86	86	86	87	87	87	88	88	89	89	90	91	91	92	93	94	95	96	97	98	100	101	102	104	106	108	110
	84	84	84	85	85	85	86	86	87	87	88	88	89	90	90	91	92	93	94	95	96	97	98	100	101	103	-
	82	82	83	83	83	83	84	84	85	85	86	86	87	87	88	88	89	89	90	91	92	93	94	95	-	-	-
	80	80	81	81	81	82	82	82	82	83	83	83	83	84	84	85	85	86	86	87	87	87	87	-	-	-	-

- WHITE ZONE: No work limits
- YELLOW ZONE: Adjust work time for 45 minutes work/ 15 minutes break per hour.
- ORANGE ZONE: Adjust work time to 30 minutes work/30 minutes break time per hour.
- RED ZONE: ALL WORK STOPS.

Table 11: Permissible WBGT Heat Exposure Threshold Limit Values

Work/Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous Work	86°F (30.0 °C)	80 °F (26.7 °C)	77 °F (25.0 °C)
75 Percent Work / 25 Percent Rest	87 °F (30.6 °C)	82 °F (28.0 °C)	78 °F (25.9 °C)
50 Percent Work / 50 Percent Rest	89 °F (31.4 °C)	85 °F (29.4 °C)	82 °F (27.9 °C)
25 Percent Work / 75 Percent Rest	90 °F (32.2 °C)	88 °F (31.1 °C)	86 °F (30.0 °C)

°C = degrees Celsius

°F = degrees Fahrenheit

12.5.1.1 Physiological Monitoring Protocols

Temperature extremes can affect on-site personnel and the use of PPE. Table 12 identifies the heat and cold stress disorders, symptoms, and treatment.

Heat stress is one of the most common (and potentially serious) illnesses that affect UXO/MEC site workers. When site personnel are engaged in operations involving hot environments, a number of physiological responses can occur which may seriously affect the health and safety of the workers. The amount and type of PPE worn directly influence reduced work tolerance as well as the increased risk of excessive heat stress. PPE adds weight and bulk, severely reduces the body’s access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, the benefit of each item should be carefully evaluated in relation to its potential for increasing the risk of heat stress.

The effects experienced by site personnel when working in cold environments depend upon many environmental and personal factors, such as ambient air temperature, wind speed, duration of exposure, type of protective clothing and equipment worn, type of work conducted, level of physical effort, and health status of the worker. In cold environments, overexposure can cause significant stress on the body, which can lead to very serious and permanent injury. Cold may affect just the exposed body surfaces and extremities, or may affect the deeper body tissues and the body core.

Table 12: Heat and Cold Stress Disorders, Symptoms and Treatment

Disorder	Symptoms	Treatment
Heat Rash. Caused by continuous exposure to heat and humid air and is aggravated by wet, chafing clothing. This condition can decrease a worker's ability to tolerate hot environments.	Mild red rash, especially in areas of the body that sweat heavily.	Decrease amounts of time in protective gear and provide powder, such as cornstarch or baby powder, to help absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes if needed.
Heat Cramps. Caused by a profuse rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat-related cramps is often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke.	Acute, painful spasms of voluntary muscles such as the back, abdomen, and extremities.	Move victim to a cool area and loosen clothing. Lightly stretch and gently massage affected muscles to increase blood flow to the area. Have patient drink one to two cups of liquids immediately, and every 20 minutes thereafter. Consult with physician if condition does not improve. If available, an electrolyte replacement solution should be taken along with liquids.
Heat Exhaustion. Heat exhaustion is a state of weakness or exhaustion caused by stress on various organs to meet increased demands to cool 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.	Pale or flushed, clammy, moist skin, profuse sweating, and extreme weakness. Body temperature is basically normal or slightly elevated, pulse is weak and rapid, and breathing is shallow. The individual may have a headache, be dizzy, or nauseated.	Move the individual to an 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 20 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.
Heat Stroke. An acute and dangerous reaction to heat stress caused by failure of the heat-regulating mechanisms of the body. The failure of the individual's temperature control system causes the perspiration system to stop working correctly. When this occurs, the body's core temperature rises very rapidly to a point (>105 °F) where brain damage and death will result if the person is not cooled quickly.	The victim's 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 sweated. Other symptoms include nausea, dizzy spells, confusion, extremely high body temperature, rapid breathing and pulse rate, convulsions or coma.	Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. The victim should be moved to a shady area; he/she should lie down and the head be elevated. 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 caffeinated or alcoholic beverages. Medical help should be summoned.

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Disorder	Symptoms	Treatment
<p>Hypothermia- Hypothermia occurs when the body cannot maintain a normal core temperature of 98.6 to 99.6 °F. Hypothermia can take a victim by surprise since it can occur above freezing. Wind, physical exhaustion, and wet clothing all make a person more prone to hypothermia. Air temperature alone is not enough to judge the cold hazard of an environment. Most cases of hypothermia develop in an air temperature of 36 to 50 °F.</p>	<p>Numbness, stiffness or pain (especially in the neck, arms, and legs); poor coordination, slurred speech and drowsiness; slow, irregular breathing and heart beat/pulse; puffiness in the face; low blood pressure; listlessness, confusion and disorientation, (it is not unusual to see someone who makes little or no effort to get out of the cold or to keep warm); collapse or exhaustion after rest; severe shivering; and death is a possibility.</p>	<p>Unconscious persons with severe hypothermia should be treated aggressively by experienced medical personnel and transported to a hospital. If no pulse is detected, CPR should be administered immediately until help arrives. Get the person out of frozen, wet, or tight clothes. Mild hypothermia in young and otherwise healthy persons can be treated by re-warming the person in a warm bed or bath with warm packs, warm dry clothes, or blankets. Have the victim drink something warm (if conscious), but do not give caffeine or alcohol. (NEVER give anything by mouth to someone who is unconscious.)</p>
<p>Frostnip - Frostnip occurs when the face or extremities are exposed to cold wind which caused the skin to turn white.</p>	<p>Firm, cold, white areas on the face, ears, or extremities; peeling or blistering that may appear similar to sunburn; and a mild hypersensitivity to cold persists.</p>	<p>The frost-nipped area should be treated by re-warming the area with an unaffected hand or a warm object. Do not use hot water.</p>
<p>Frostbite - Frostbite occurs when there is freezing of the skin. It can occur without hypothermia when the extremities do not receive sufficient heat from central body stores because of inadequate clothing or circulation. The most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes. Damage from frostbite can be serious; scarring, tissue death, and amputation are all possible, as is permanent loss of movement in the affected parts. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly. If skin should come in contact with objects colder than freezing, frostbite may develop at the point of contact, even in a warm environment.</p>	<p>The area is cold, hard, white, and anesthetic; on warming, it becomes blotchy red, swollen and painful; depending on the extent of the injury, the area may recover normally, or deteriorate to gangrene.</p>	<p>Remove restrictive clothing or jewelry near the affected area or body part. Warm the frozen part and exercise it, but do not walk on frostbitten feet. Warm the frozen part quickly with sheets and blankets. Remove wet clothing from the affected area and gently dry the affected part. Place the affected part next to a warm part of the body. Seek medical attention immediately. Do not rub the affected areas. Do not apply a heat lamp or very hot water bottle. Do not go near a hot stove. Do not break any blisters. Do not drink caffeine or alcohol to treat for hypothermia or frostbite. Do not re-warm the frozen tissue if refreezing is a possibility. Do not use hot water (use warm water only).</p>
<p>Chilblains - Chilblains are caused by prolonged, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. When this affects the feet it is called “trenchfoot.”</p>	<p>Swelling, tingling, itching and severe pains; possibly blistering, tissue death and ulceration; pale, clammy cold skin that is swollen and numb; infection is likely; or sensitivity to temperature may persist for years.</p>	<p>Treatment for chilblains is the same as for frostbite.</p>

12.5.1.2 Prevention Protocols

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat exhaustion, that person may become predisposed to additional heat injuries. In order to avoid heat-related illnesses, proper preventive measures will be implemented whenever environmental conditions dictate. These preventive measures represent the minimal steps to be taken and will include the following procedures.

12.5.1.3 Heat Stress Preventative Measures

The UXOSO will examine each site worker prior to the start of daily operations to determine the individual's susceptibility to heat-induced stress. Workers exhibiting factors which make them susceptible to heat stress will be closely monitored by the UXOSO.

Site workers will be trained to recognize and treat heat-related illnesses. This training will include the signs, symptoms, and treatment of heat-stress disorders.

In order to maintain their body fluids at normal levels, workers will be encouraged to drink, at a minimum, approximately 16 ounces of liquids prior to start of work in the morning, after lunch, and prior to leaving the site at the conclusion of the day's activities. Disposable 4- to 12-ounce cups and liquids will be provided on-site. Liquids to be provided will include water and an electrolyte replacement solution, with the intake of each being equally divided. Liquids containing caffeine are to be avoided.

When ambient conditions and site workload requirements dictate, as determined by the UXOSO, workers will be required to drink a minimum of 16 to 32 ounces of liquids during each rest period. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, workers will be encouraged to drink even though they may not be thirsty.

A shelter or shaded area will be provided where workers may be protected from direct sunlight during rest periods.

Monitoring of ambient or physiological heat stress indices will be conducted to allow prevention and/or early detection of heat-induced stress.

Site workers will be given time to acclimate to site work conditions, temperature, protective equipment, and workload. Acclimation is the adaptive process that results in a decrease of the physiological response produced by the application of a constant environmental stress.

Upon initial exposure to a hot environment there is an impaired ability to work, and evidence of physiological strain. If the exposure is repeated on several successive days, there is a gradual return of the ability to work and a decrease in physiological strain.

Acclimation usually takes two to six days of continued work in hot environments, and allows the worker's body to become adjusted to this level and type of work. This process involves a gradual increase in the workload over the required period, the length of which depends upon the nature of the work performed, the ambient temperatures, and the individual's susceptibility to heat stress. The results of acclimation include: subjective discomfort practically disappears; body temperature and heart rate are lower; there is a more stable blood pressure; and the sweat is more profuse and dilute.

Work schedules will be adjusted as follows:

- Mandate work slowdowns as needed
- Rotate personnel: Alternate job functions to minimize overstress or overexertion at one task
- Add additional personnel to work teams
- Perform work during cooler hours of the day if possible
- 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 workloads. 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

Alcohol should not be consumed in a hot environment because the loss of body fluids increases the risk of heat stress.

12.5.1.4 Cold Stress Preventative Measures

A wind chill chart, "Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature," will be available on-site and should be used to monitor the conditions on exposed flesh. Cold injuries are classified as either localized (such as frostnip, frostbite), or generalized as in hypothermia (a lowering of the body's core temperature).

Workers exposed to the cold should be physically fit, without any circulatory, metabolic, or neurological diseases that may place them at increased risk for hypothermia. A new employee should not be required to work in the cold full time during the first days of employment until they become adjusted to the working conditions and required protective clothing. New workers should be introduced to the work schedule slowly and be trained accordingly. Table 13 describes the recommended working and warm-up times for cold weather activities.

Working in the cold can cause a significant water loss through the skin and lungs as a result of the dryness of the air. Increased fluid intake is essential to prevent dehydration, which can increase the risk of damage to the extremities since blood flow is decreased. Warm, sweet drinks (not caffeinated), or soups should be consumed. Table 12 addresses the recommended work warm-up schedule for outdoor activities.

As with heat stress, consuming extra salt is not necessary. It is very important for persons working in cold environments to eat a well balanced diet. Workers should avoid smoking, drugs, or alcohol use since these can restrict circulation and/or cause heat loss.

Safe Work Practices:

- Walk carefully on snowy and icy surfaces
- If you shovel snow, be very careful to avoid overexertion. Keep relatively active, but not so active that you become damp with sweat
- Change out of wet clothing as soon as possible
- Do not use unprotected metal chair seats or touch any cold objects with bare hands
- People who are taking certain medications, older, overweight, have allergies, smoke, or have poor circulation (diabetics, for example) are more prone to cold injuries and should take extra precautions
- DO NOT drink alcohol
- Avoid soaking of clothing or gloves with any liquids (especially gasoline, alcohol, or cleaning fluids) due to the added danger of evaporative cooling
- Always work under the buddy system if you must travel or work outdoors in dangerous conditions
- As much as possible, avoid using vibrating tools in very cold temperatures
- Wear Ultraviolet (UV) protective eyewear if you must work outdoors in snow or ice-covered terrain
- If you have a pre-existing injury, or if you are injured on the job during cold stress periods, see your supervisor immediately. Injured tissues can be more susceptible to the cold

Recommended Clothing:

- Clothing should resist rain and wind but also allow water vapor generated by perspiration to escape
- Do not wear constrictive garments. Instead, wear several layers of loose-fitting clothes that can be added or removed as needed to aid in evaporation of sweat
- Suspenders may be used instead of belts which can constrict and reduce circulation. Thin cotton fabric is very good since it helps evaporate sweat. Wear a cotton T-shirt and shorts under cotton or wool thermal underwear and wool or thermal trousers
- Wear socks with high wool content and insulated boots. When two pairs of socks are worn, the inside pair should be smaller and made of cotton
- Wear a hat. You can lose up to 40 percent of your body heat through your head if it is not covered
- Gloves should be worn when temperature is below 40 °F
- Wear a facemask and/or scarf if it is windy or extremely cold, and cover your mouth to protect your lungs

Table 13: Work Warm-Up Schedule for Outdoor Activities

Wind Speed	No Noticeable Wind		5 Miles per Hour (MPH)		10 MPH		15 MPH		20 MPH	
	Max Work Period	Number of Warm-up Breaks	Max Work Period	Number of Warm-up Breaks	Max Work Period	Number of Warm-up Breaks	Max Work Period	Number of Warm-up Breaks	Max Work Period	Number of Warm-up Breaks
Ambient Air Temp (Degrees Fahrenheit Below 0)										
0-15	Normal	1	Normal	1	75 min	2	55 min	3	40 min	4
15-19	Normal	1	Normal	1	75 min	2	55 min	3	40 min	4
20-24	Normal	1	75 min	2	55 min	3	40 min	4	30 min	5
25-29	75 min	2	55 min	2	40 min	4	30 min	5		
30-34	55 min	3	40 min	4	30 min	5				
35-39	55 min	3	40 min	4	30 min	5				
40-44	30 min	5								
≥ 45										

NOTES: This information applies to any four-hour period.
 Warm-up breaks are at least 10 minutes in a warm environment.
 These guidelines apply to workers wearing appropriate clothing.
 Max Work Period = Max Work Period with normal breaks.

12.5.1.5 Heat/Cold Stress Documentation

The UXOSO will be responsible for recording all heat/cold stress related information. This will include training sessions and monitoring data. Training sessions will be documented on the “Documentation of Training” form, and WBGT data and other information will be recorded in the Safety Log.

12.6 RADIOLOGICAL HAZARDS

In accordance with previous activities performed at the project a radiological hazard is not anticipated within the project area.

12.7 BIOLOGICAL HAZARDS

Biological hazards, which are usually found on-site, include snakes, spiders, bees, dangerous animals, hazardous plants, and microorganisms. Employee awareness and adherence to the safe work practices outlined in the following sections should reduce the risks associated with these hazards.

12.7.1 Hazardous Plants



Poison Oak

Poison Oak is reported to be in the areas of Lassen County. Contact with the plant is of special concern because exposure to the urushiol oil in the plant’s leaves can result in an allergic reaction in most people. The most common symptom of the reaction is skin irritation characterized by redness, blistering, swelling and severe itching. Although in most cases these symptoms develop within 24-48 hours some victims may experience symptoms within 30 minutes. Personnel suspecting they have been

exposed to poison oak should report to the UXOSO for initial treatment.

In addition, to Poison Oak, contact with other plants, brush and trees having splinter, thorns, and sharp leaf hazards are of special concern to site personnel. Further sites cleared by brush removal crews may present unique hazards caused by tree/shrub branches, limbs, and small trunk residue. This concern stems from the possibility of puncture wounds, cuts, and even minor scrapes may result from an unexpected accident causing non-infectious skin lesions and/or the introduction of fungi, or bacteria, through the skin or eye. Personnel receiving any of the injuries listed above, even minor scrapes will report immediately to the UXOSO for initial care and continued observation of the injury.

12.7.2 Hazardous Reptiles

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 sufficient to frighten the snake. 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, holes, crevices, abandoned pipes, etc.). There is one poisonous snake present in Northern California which could be expected at this site:

Northern Pacific Rattlesnake (<http://www.calpoison.org/public/snakebite.html>)



The venom of this snake is potentially dangerous to humans.

The Northern Pacific Rattlesnake ranges in size from 15 - 36 inches long, sometimes up to 48 inches and 60 inches being the longest.

The Northern Pacific Rattlesnake is a heavy-bodied, venomous pit viper, with a thin neck and a large triangular head. Pupils are elliptical. Scales are keeled with a light stripe extending diagonally from behind the eye to the corner of the mouth.

The Northern Pacific Rattlesnake has a variable color matching the environment - olive-green, gray, brown, golden, reddish brown, yellowish, or tan. Dorsal blotches on the front 2/3 of the body, changing to dark bars on the body and dark and light rings on the tail which are well-defined and of fairly uniform width, with a rattle at the end of the tail, consisting of loose interlocking segments (Young have a bright yellow tail).

Dark brown or black blotched markings down the back, usually with dark edges and light borders, with corresponding blotches on the sides. This pattern is brighter on juveniles than on adults.

Heat sensing pits on the sides of the head help the snake to locate prey by their warmth. Long, hollow, movable fangs connected to venom glands inject very toxic venom which quickly immobilizes prey. The snake can control the amount of venom injected and the fangs are replaced if broken. Bites on humans are potentially dangerous without immediate medical treatment. Even a dead snake can bite and inject venom if the jaws reflexively open when they are touched.

The Northern Pacific Rattlesnake is known to inhabit rocky hillsides, talus slopes and outcrops, rocky stream courses, rocky areas in grasslands, mixed woodlands, mountain forests, pinion juniper, sagebrush, in areas from sea level to around 11,000 ft. With young being born August - October.

The snake is primarily nocturnal and crepuscular during periods of excessive daytime heat, but also active during daylight when the temperature is more moderate, but not active during cooler periods in winter. In colder areas, it is known to den in burrows, caves, and rock crevices, sometimes in large numbers, and sometimes with other snake species.

Its prey is found while the snake is actively moving, or by ambush, where the snake waits near lizard or rodent trails, striking at and releasing passing prey. The snake then follows the trail of the en-venomated animal and swallows it whole.

When alarmed, the snake shakes its tail back and forth. The movement rubs the rattle segments together producing a buzzing sound which serves as a warning. Juveniles are born with only a silent button at the end of the tail.

Eats small mammals, including ground squirrels, mice, rats, rabbits and hares, birds, lizards, snakes, frogs, and insects.

Severity of Snake Bites

Signs and symptoms of snakebites generally occur immediately. The severity of a rattlesnake bite, depending on how much venom was injected, is gauged by how rapidly symptoms develop. Bites from this snake are seldom fatal, but may still produce serious consequences. Other factors that determine the severity of a snake bite include the following:

- The location of the bite -- fatty tissue absorbs the venom more slowly than muscle
- Whether pathogens are present in the venom
- The patient's size, weight, and age
- The patient's general health and physical condition at the time of envenomization
- How much physical activity the patient engaged in after the bite occurred

Signs and symptoms to look for:

- Fang marks that are often little more than a small scratch or abrasion but may be actual punctures
- There may NOT be two fang marks present at the bite site -- often, only one fang makes contact
- Swelling and pain at the wound site
- Continued oozing at the wound site
- Weakness, dizziness, or faintness
- Minty, metallic, or rubber taste in mouth and lips
- Sweating and/or chills
- Thirst
- Nausea and vomiting
- Numbness and tingling around the face and head (a classic symptom)
- Diarrhea
- Rapid heartbeat and low blood pressure

- Bloody urine and gastrointestinal hemorrhage (late stages)
- Bruising
- Dead tissue around the wound
- Shallow respirations, progressing to respiratory failure

General Dos:

- Remove everyone from risk
- Calm the patient
- Use your snakebite kit immediately. The first few minutes are the most effective for venom removal. Follow the instructions provided in the kit
- Seek medical help at once. Recent studies indicate the single most effective thing you can do is calmly transport the victim to a medical facility. In most cases, severe complications DO NOT occur until several hours after the bite. If you're deep in the wild, make wise use of your time, but don't rush
- Remove tight watches, sleeves, jewelry, etc. Cut these items off if you have to. Note that rings and bracelets are especially hazardous as they will severely restrict blood flow to their particular extremity once swelling begins
- While enroute to a hospital, apply a loose yet constricting band between the bite and the heart. This is NOT a tourniquet and should not be any tighter than a semi-tight watch band
- Keep the patient still if possible and immobilize the injured limb with a splint
- Treat the site like a puncture wound. If possible, wash the wound with copious amounts of soap and water
- Keep the affected extremity at heart level or lower
- Avoid alcohol. It only increases metabolism and impairs judgment

General Don'ts:

- DO NOT GIVE ANTIVENIN IN THE FIELD!
- Don't kill the snake! Such an attempt may produce yet another bite.
- Don't try to capture the snake -- it's not necessary. There are only two types of venom -- neurotoxin and hemotoxin (antivenin for rattlesnake bites is the same for all species). Based on the geographic area and the patient's symptoms, a doctor will usually know which type of antivenin to use
- NEVER cut an "X" at the bite site
- NEVER suck out venom with the mouth
- Don't excite the victim or allow him/her to walk if avoidable. Doing so will increase venom circulation
- Never apply a tourniquet or constricting band unless you are well-trained in its use. (If, for some reason you do apply one, write a capital T (for tourniquet) on the victim's forehead AND the TIME you applied it.
- Do not apply ice, a cold pack, or freon spray to the wound
- Never apply electrical stimulation from any device in an attempt to retard or reverse venom spread

12.7.3 Hazardous Spiders and Insects

A large variety of spiders may be encountered during site activities. While most spider bites merely cause localized pain, swelling, reddening, and in some cases, tissue damage, there are a few spiders, which, due to the severity of the physiological effects caused by their venom, are dangerous.

12.7.3.1 Spiders

- **Black Widow Spider**



Black widow spiders generally live in trash, closets, attics, woodpiles, garages, and other dark places. Only the female spider is dangerous to humans.

The black widow spider is a shiny, inky black spider with a large round tail segment (abdomen). Including its legs, the black widow generally measures from one-half inch to one inch in length. Red to orange-colored markings, usually in the shape of an hourglass, are found on the underside of the belly.

A black widow spider bite gives the appearance of a target, with a pale area surrounded by a red ring. Severe muscle pain and cramps may develop in the first two hours. Severe cramps are usually first felt in the back, shoulders, abdomen and thighs. Other symptoms include weakness, sweating, headache, anxiety, itching, nausea, vomiting, difficult breathing, and increased blood pressure. Young children, the elderly, and those with high blood pressure are at highest risk of developing symptoms from a black widow spider bite.

If a black widow spider bites a person, do not panic! No one in the United States has died from a black widow spider bite in over 10 years. Very often the black widow will not inject any venom into the bite and no serious symptoms develop. Wash the wound well with soap and water to help prevent infection.

If muscle cramps develop, take the patient to the nearest hospital. Some victims, especially young children, may be admitted overnight for observation and treatment. There is treatment for a black widow spider bite that can take care of the symptoms. Various medications are used to treat the muscle cramps, spasms, and pain of a bite. Black widow spider antivenin is seldom necessary.

- **Jumping Spider**



The jumping spider is probably the most common biting spider in the United States. People are caught by surprise and scared when they see the spider jump, especially if it jumps towards them. Bites from a jumping spider are painful, itchy and cause redness and significant swelling. Other symptoms may include painful muscles and joints, headache, fever, chills, nausea and vomiting. The symptoms usually last about 1-4 days.

- **Wolf Spider**



Wolf spiders are large hairy spiders, up to 3-4 inches across. They are a mottled gray-brown color, which helps them hide in sand, gravel, leaves, and other debris. Female wolf spiders carry their young on their backs. Except for one group, wolf spiders do not spin webs. They tend to burrow into the earth and hide. They are aggressive, come after their prey, and are fast runners. Because of their impressive size and aggressiveness, wolf spiders can easily

incite panic.

Bites from a wolf spider can cause pain, redness, and swelling. The large jaws/fangs can cause a tear in the skin as they bite. Swollen lymph glands may develop. The skin area at the bite may turn black. Swelling and pain can last up to ten days.

- **Tarantula**



Tarantulas are also large hairy spiders. In fact, some people call any large hairy or fuzzy spider a tarantula. Tarantulas are very hairy with sharp bristles. The hairs are easily shed or can be rubbed off. Handling a tarantula can result in irritation to the skin. If hands are not washed after handling a tarantula and eyes are touched, the sharp hairs can cause eye irritation that may require a trip to the physician. Tarantulas are sensitive to vibrations and hunt at night by touch. If cornered, the tarantula will make a purring sound and may rear up on its back legs. Even though tarantulas are scary looking to most people, most bites do not produce any significant poisoning symptoms.

However, the bites can be quite painful because of the large size of the spider. Wash your hands well with soap and water after handling a tarantula.

- **Brown Recluse Spider (Araneae: Loxascelidae, *Loxosceles reclusa*)**



SIZE: 1/4 to 3/4 inch (6.4-19.1mm)

COLOR: Golden brown

Brown recluse spiders belong to a group of spiders commonly known as violin spiders or fiddle backs. This is because of a characteristic fiddle-shaped pattern they have on their head region. The spider is golden brown with the fiddle being dark brown or black. This spider is not hairy and the fiddle pattern is often shiny. They are about 1/4 to 3/4 inch long.

SYMPTOMS: The severity of the bite may vary. The symptoms may vary from no harm at all to a reaction that is very severe. Often there is a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness, and joint pain. Where the bite occurs there is often tissue death and skin is sloughed off. In some severe cases, a wound may develop that lasts several months.

In all cases, a physician should be notified. If at all possible, kill and take the spider to the physician for positive identification. Individual spiders can be crushed underfoot or sprayed with an aerosol spray. Clean up and remove any potential hiding places.

Important note: Many of the wolf spiders are similar in appearance and have similar markings as the brown recluse. They are large, robust, and hairy and, therefore, can be distinguished from the brown recluse.

- **Northwestern Brown Spider (Hobo Spider)**



The northwestern brown spider or hobo spider (*Tegenaria agretis*) is well known in Oregon and Washington and is also quite common in California. Spider bites by this spider are becoming recognized more often in California, which may be due to the fact that the spider is becoming better known. The hobo spider often causes a bite that leaves an open, slow-healing wound. Bites from this spider are frequently and

mistakenly thought to be brown recluse spider bites. Keep the wound clean and prevent infection. If the bite becomes infected or does not seem to heal, see a physician.

- **Other Spiders**

While most spider bites are not dangerous, there is a group of spiders that can produce bite wounds that look similar to a brown recluse spider bite. Unless the spider was

actually seen, captured, and brought to the physician, the brown recluse spider is not likely to be the culprit. Some of the spiders in this group that can cause a nasty bite include the jumping spider, wolf spider, crab spider, orbweaver spider and the nursery spider.

In most cases of bites from these spiders, there is pain or burning at the bite site in the first 10 minutes. The bite from this group is usually described as looking like a "target" or "bull's-eye." The center of the wound is usually a blister surrounded by a reddened area. A pale or blanched area may surround the discolored reddened area. The blister may rupture, leaving an open ulcer. In severe cases the ulcer can become deep and infected causing tissue breakdown or tissue death (necrosis).

Worsening pain, itching, and a burning sensation develop. A patient may also have symptoms such as a red, itchy rash over the torso, arms and legs that is usually seen in the first 24-72 hours. Patients may have pain in the muscles and joints, fever, chills, swollen lymph nodes, headaches, and nausea and vomiting.

Frequently, when people with spider bites call the Poison Center, they think there is some special treatment that is necessary for their bite. There is no specialized therapy other than treating the symptoms. Most importantly, keep the wound clean to prevent infection. If the wound does not heal or does develop an infection, see your physician. Do not wait days and weeks while the wound continues to get worse.

12.7.3.2 Ticks

- **Female Black Legged Tick**



Black-legged ticks (*Ixodes scapularis*) are responsible for transmitting Lyme disease bacteria to humans in the northeastern and north-central United States. Most ticks 'quest' (ambush) for hosts in low lying brush and leaf litter on the forest floor. This is accomplished by climbing to the edge of leaves or twigs, and holding their front legs out. When a host passes by, they attach themselves and look for a suitable feeding site. They are widely dispersed, but often accumulate along pathways, game trails, or bedding locations used by their hosts.

Ixodes ticks are much smaller than common dog and cattle ticks. Sites favored by the ticks are the waistline, thighs, armpit, hairline and head, but may be found in any location.

NOTE: Prompt removal of attached ticks, can prevent transmission of Lyme Disease. Studies have shown removal of attached, infected ticks within 48 hours significantly reduces risk of acquiring the disease.

Lyme Disease

The Lyme disease bacterium can infect several parts of the body, producing different symptoms at different times. In some cases individuals infected with Lyme disease will not display symptoms, or many of the symptoms can occur simultaneously with other diseases. If an individual believes they may have contracted Lyme disease, seek medical attention immediately. Most cases of Lyme Disease can be cured with antibiotics, if treatment begins early. However, in some cases, a small percentage of treated individuals will still have symptoms months to years after treatment.

Lyme Disease symptoms to watch for:

- a. A circular rash called erythema migrans. Rash begins at the site of tick bite in 70-80% of infection cases. Delay period is 3-30 days.
- b. Rash gradually expands over a period of several days, and can reach 12 inches (30 cm) across.
- c. Center of rash may clear up as it enlarges, resulting in a bull's-eye appearance. It may be warm but is not usually painful.
- d. After several days some individuals may develop additional EM lesions on other areas the body.
- e. Additional symptoms may include fatigue, chills, fever, headache, and muscle and joint aches, and swollen lymph nodes. In some cases, these may be the only symptoms of infection.



Untreated, the infection may spread to other parts of the body within a few days to weeks, producing an array of discrete symptoms. These symptoms include loss of muscle tone on one or both sides of the face (called facial or “Bell’s palsy). Severe headaches and neck stiffness due to meningitis, shooting pains that may interfere with sleep, heart palpitations and dizziness due to changes in heart

rate, and pain moving from joint to joint. Many of these symptoms will resolve, even without treatment.

After several months, approximately 60% of untreated individuals will begin having intermittent bouts of arthritis, with severe joint pain and swelling, the knees being most susceptible. An additional 5% of untreated individuals may develop chronic neurological complaints months to years after infection including shooting pains, numbness or tingling in the hands or feet, and problems with concentration and short-term memory.

Tick Prevention

- a. Insect repellent with 20% - 30% DEET on adult skin and clothing.
- b. Permethrin applied to pants socks and shoes. Can be purchased at outdoor equipment stores that carry camping or hunting gear. Permethrin kills ticks on contact! One

application typically stays effective through several washings. **DO NOT APPLY Permethrin directly on the skin.**

- c. Wear long pants, long sleeves, and long socks to keep ticks off your skin. Light-colored clothing helps in locating ticks more easily. Tucking pant legs into socks or boots and tucking shirts into pants help keep ticks on the outside of clothing. For extended periods outdoors, tape your pants cuffs closed to prevent ticks from crawling under your clothes.

Tick Removal and First Aid

Don't use petroleum jelly, hot match, nail polish, or other products to remove an imbedded tick

- a. Upon locating a tick, remove it from your skin.
- b. Using fine-tipped tweezers, firmly grasp the tick very close to your skin.
- c. With a steady motion, pull the tick's body away from skin. But avoid crushing the body. **NOTE: If you accidentally crush the tick, clean your skin with soap and warm water or alcohol.**
- d. Thoroughly clean skin with soap and warm water.

Note: Don't be alarmed if tick's mouth parts remain in the skin. Once the mouth parts are separated from a tick, it can no longer transmit Lyme Disease bacteria.

12.7.3.3 Bees, Hornets, and Wasps



Stings from bees, hornets, and wasps cause more deaths than bites and stings from all other insects and spiders. Death is usually a result of an allergic reaction.

Honeybees are the only stinging insects that leave a stinger in the wound. Other bees can sting repeatedly. If stung by a bee, check the wound to see if the stinger is still there. The stinger will be clearly visible. If the stinger is still there, scrape or flick it out with something stiff like a credit card. Do not try to pull the stinger out as squeezing injects more venom into the wound. Usual symptoms include a burning pain and swelling.

Unusual symptoms can signal the onset of an allergic reaction. There are two types of allergic reactions. In the first type, the bite or sting site becomes excessively swollen and the patient may experience nausea, vomiting, dizziness, and headache.

The second type of allergic reaction can be life-threatening. A severe reaction can cause body-wide skin itching, hives, or puffiness of the eyes, nose, lips, tongue, and throat. Abdominal pain and vomiting may develop. Breathing difficulties are common. The patient may collapse and go into shock. This kind of reaction presents a true medical emergency.

Allergic reactions usually do not develop after the first sting. After a second or third sting, a reaction can develop. It is difficult to predict whether a person will have a life-threatening allergic reaction. If you or family members are very allergic or have asthma, you are more likely to be allergic to stings and should be careful around stinging insects.

If breathing difficulties, difficult swallowing, and/or body-wide itching develop, the patient is having a severe allergic reaction. Otherwise, wash the bite or sting area well with soap and water to help prevent infection. If stung or bitten on fingers or hand, remove any rings or jewelry in case of swelling. Your local pharmacist can help you select the best over-the-counter medications to help treat insect and spider bites.

Things to keep in mind:

- Do not leave food, drinks, or garbage out and uncovered
- Wear a Medic-Alert bracelet if extremely allergic to bee or wasp stings
- If you are allergic, ask your physician about prescribing an emergency bee-sting kit to have on hand

Prevention of Bee and Wasp Stings

The following precautions will be taken during field activities for the prevention of stings from bees and wasps:

- Be aware of the presence of bees and wasps while you are working especially in the vicinity of flowers. Bees tend to sting if they feel threatened or are disturbed
- Avoid wearing floral patterns or using floral scents, which will attract bees.
- Personnel that are sensitive to bees must make the UXOSO aware of this and should carry a bee sting kit with them
- If bees or wasps get trapped inside your vehicle while you are driving, pull over to the shoulder and let the creature escape before you continue driving
- Only strike a wasp or bee if you are sure to kill it. If you strike or kill a wasp or bee you will set off its defense pheromone, which will bring unhappy relatives calling
- In the event of a massed sting attack, try to stay calm, cover your head if possible, and run steadily to safety. Get into anything that is sealed in such a way as not to allow insect entry, such as a vehicle

Treatment of Normal Insect Stings

All bee stings include an alarm pheromone, which incites their mates to attack, so step one is to get away from a nest/hive with all speed. Scrape out stingers as soon as possible. A honeybee sting has a pump attached that continues to introduce venom for 1 minute after stinging. A wasp does not leave its stinger. Apply an ice pack to minimize swelling and pain. Lift limb to heart level to reduce swelling.

Treatment of Severe Reaction to Insect Stings

If the victim has been stung multiple times, is young or old, or is one of the 1% that is allergic to stings, watch for signs of systemic allergies. These may include:

- Headaches
- Fever
- Nausea
- Vomiting
- Swelling of the tongue or throat
- Difficulty in breathing
- Cramps
- Drowsiness
- Unconsciousness

GET MEDICAL HELP

Personnel with known sensitivity to stings and who have an Epinephrine kit should have it administered, followed by an ice pack and a visit to a hospital. Employees on the site who know they are allergic to bee stings should make the UXOSO and co-workers aware of that fact, and should have their Epinephrine kit with them at all times. Co-workers should know where the kit is located and how to administer it in an emergency. Bee stings can be sensitizers and allergies can develop over time. Because a person has been stung in the past and has had no reaction, does not necessarily mean that the next sting will not bring on an allergic reaction. All employees will be made aware of the symptoms of anaphylactic shock, so that they can recognize it in themselves and co-workers and act accordingly.

13.0 LOGS, REPORTS, AND RECORDKEEPING

13.1 LOGS

The Safety Log and records will be completed and retained by the PM for the duration of the project. At the close of the project, they will be turned over to the Program Manager as part of the official project file.

13.1.1 Safety Log

The TLI Solutions UXOSO will maintain a daily safety log of all safety-related activities. When safety and health deficiencies are noted during daily inspections, the measures, timetable, and individual responsible for correcting the deficiencies will be noted in the safety log. The UXOSO will also annotate the log when deficiencies have been corrected.

The following information will be addressed at a minimum in the daily Safety Log:

- Date and recorder of log
- Significant site events relating to safety
- Accidents
- Stop-work actions due to safety
- Safety audits/deficiencies noted/corrective actions
- Signature of the UXOSO
- Signature of the SUXOS indicating his review
- Training logs
- A record of all individual training qualifications, of on-site personnel, will be maintained on-site
- Records of Site-specific Training, Visitor Training, and Daily Safety Briefings will be retained in the project files

13.1.2 Equipment Maintenance Logs

Records of maintenance for equipment used on-site will be maintained as part of the project files.

13.1.3 Employee/Visitor Registration Records

A record of all employees and visitors coming onto the site will be recorded and retained in the project files.

13.1.4 Environmental and Personal Exposure Monitoring

The characteristics of this site reflect no anticipated toxic, chemical, or radiological hazards during activities under the SOW. The requirements for this section are not included.

13.2 REPORTS

13.2.1 Safety Reports

The following safety reports will be submitted as required by applicable USAESCH and OSHA regulations:

- Medical Monitoring Records of employee(s) obtained after site investigations begin
- Accident Investigation Report (ENG Form 3394). See Attachment 2
- When a reportable injury/illness/accident occurs at the job site, the Accident Investigation Report form (ENG Form 3394) will be completed and forwarded within 48 hours to TLI Solutions and USAESCH
- If a near miss occurs, the accident form will be completed and retained for the record. The PM will inform the USAESCH PM of any accidents
- If an OSHA reportable accident occurs, the PM will report all required information to the USAESCH PM within 8 hours
- When any injury/illness/accident occurs at the job site, the Earth Tech Accident Investigation Report form will be completed and forwarded within 48 hours to TLI Solutions
- This accident report form will be used by TLI Solutions to report incidents and as a basis of reevaluation of procedures and controls for personnel protection

13.2.2 Safety Exposure Report

The following information shall be reported in accordance with *DID OE-080.01*.

1. Field labor hours in direct support of the contract, and cumulative.
2. Total number of lost workday accidents during the reported month, and cumulative.
3. Total number of lost workdays due to on-the-job accidents during the reported month, and cumulative.
4. Number of property damage accidents (includes vehicles) with property value of \$2,000 or more, during the reported month and cumulative.

13.3 RECORDKEEPING

All recordkeeping will be in accordance with applicable OSHA and USAESCH standards and regulations.

A Documentation of Training form will be prepared for the daily Tailgate Safety Briefing, as well as for any additional safety training performed on-site.

ATTACHMENT 1

**TABLE OF CHEMICAL HAZARDS
ASSOCIATED WITH UXO/MEC**

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Attachment 1

Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Aluminum (metal/dust) (sub-component of Thermite) Silvery-white, malleable, ductile, odorless metal</p>	<p>Combustible solid, finely divided dust is easily ignited; may cause explosions.</p> <p>Symptoms: irritation eyes, skin, respiratory system</p>	<p>NIOSH REL: TWA 5 mg/m³ (dust)</p> <p>OSHA PEL: 5 mg/m³ (dust)</p> <p>IDLH: Not determined</p>
<p>Aluminum oxide (a-alumina) (sub-component of Thermite) Odorless, white powder</p>	<p>Stable under ordinary conditions of use and storage.</p> <p>Symptoms: coughing or shortness of breath may occur in cases of excessive inhalation, and may cause irritation with redness and pain</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: TWA 5 mg/m³</p> <p>IDLH: Not determined</p>
<p>Aluminum pyro Powder Varies depending upon specific compound</p>	<p>Symptoms: irritation of skin, respiratory system; pulmonary fibrosis</p>	<p>NIOSH REL: 5 mg/m³</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Ammonium Nitrate Colorless to white crystals or granules; odorless</p>	<p>Symptoms: irritation of eyes, skin; possible eye, skin burns; cough, difficult breathing, nausea, vomiting, diarrhea; low blood pressure</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Antimony (metal) Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder</p>	<p>Noncombustible solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.</p> <p>Exposure routes: inhalation, ingestion, skin and/or eye contact</p> <p>Symptoms: irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly</p>	<p>NIOSH REL: TWA 0.5 mg/m³</p> <p>OSHA PEL: TWA 0.5 mg/m³</p> <p>IDLH: 50 mg/m³</p>
<p>Antimony sulfide black powder</p>	<p>Stable. Incompatible with acids (reacting to form poisonous hydrogen sulfide), moisture, water.</p> <p>Symptoms: harmful by inhalation and if swallowed. May be harmful in contact with the skin. skin, eye and respiratory irritant. Chronic exposure may lead to kidney or liver damage</p>	<p>NIOSH REL: TLV/TWA 0.5 mg/m³</p> <p>OSHA PEL: 0.5 mg/m³</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Arsenic (metal) Silver-gray or tin-white, brittle, odorless solid</p>	<p>Noncombustible solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.</p> <p>Exposure routes: inhalation, skin absorption, skin and/or eye contact, ingestion</p> <p>Symptoms: ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, [potential occupational carcinogen]</p>	<p>NIOSH REL: Ca C 0.002 mg/m³ [15-minute]</p> <p>OSHA PEL: TWA 0.01 mg/m³</p> <p>IDLH: Ca [5 mg/m³ (as As)]</p>
<p>Barium (metal) Metallic element, soft, silvery white, easily oxidized, odorless, solid</p>	<p>Flammable solid, powder can ignite spontaneously in air</p> <p>Irritation of eyes, skins, upper respiratory system; skin burns, gastroenteritis; muscle spasms, slow pulse</p>	<p>NIOSH REL: 0.5 mg/m³</p> <p>OSHA PEL: 0.5 mg/m³</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Barium nitrate (sub-component of Thermite) White, odorless solid</p>	<p>Noncombustible solid, but will accelerate the burning of combustible materials. Strong oxidizer, contact with other material may cause fire, may be fatal if swallowed.</p> <p>Exposure routes: inhalation, skin absorption, skin and/or eye contact, ingestion.</p> <p>Symptoms: irritation to the eyes, respiratory system, irritation to skin, redness, itchiness, tightness of muscles in the face and neck, vomiting, diarrhea, abdominal pain, muscle tremors, anxiety, gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia convulsions, death</p>	<p>NIOSH REL: TWA 0.5 mg/m³</p> <p>OSHA PEL: TWA 0.5 mg/m³</p> <p>IDLH: 50 mg/ m³</p>
<p>Barium peroxide greyish white powder</p>	<p>Stable. Strong oxidizer - contact with combustible material may cause fire. Incompatible with organic materials, combustible materials, reducing agents, most common metals.</p> <p>Symptoms: toxic - may be fatal if swallowed. Chronic exposure may lead to damage to CNS, spleen, liver, kidney or bone marrow. Skin or eye contact may lead to severe irritation or burns. Respiratory irritant</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Barium sulfide Yellow-green or gray heavy powder or lumps</p>	<p>Flammable gas formed by spontaneous chemical reaction with air, moisture, or acid fumes. Gas can be explosive and very poisonous</p> <p>Symptoms: irritation eyes, nose, upper respiratory system; benign pneumoconiosis (baritosis)</p>	<p>NIOSH REL: 0.5 mg/m³</p> <p>OSHA PEL: 0.5 mg/m³</p> <p>IDLH: 50 mg/m³</p>
<p>Bismuth (metal) Hexagonal silver-white or reddish metallic crystals</p>	<p>Flammable when exposed to flame, poisonous to humans.</p> <p>Symptoms: harmful if swallowed. May cause irritation. Avoid breathing vapors, or dusts. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Cadmium (metal) Silver-white, blue-tinged lustrous, odorless solid</p> <p>Harmful if swallowed. May cause irritation. Avoid breathing vapors, or dusts. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed</p>	<p>Metal: Noncombustible Solid in bulk form, but will burn in powder form.</p> <p>Symptoms: pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]</p>	<p>NIOSH REL: Carcinogen (LFC)</p> <p>OSHA PEL: TWA 0.005 mg/m³</p> <p>IDLH: Ca [9 mg/m³ (as Cd)]</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Calcium silicide Gray solid</p>	<p>Flammable solid, may ignite spontaneously in air, reacts with water</p> <p>Symptoms: irritation eyes, skin</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Chlorobenzylmalononitrile (CS) White crystalline solid with a pepper-like odor</p>	<p>Incompatible with strong oxidizers</p> <p>Symptoms: pain, burn eyes, lacrimation (discharge of tears), conjunctivitis; erythema (skin redness) eyelids, blepharospasm; irritation throat, cough, chest tightness; headache; erythema (skin redness), skin vesiculation</p>	<p>NIOSH REL: C 0.05 ppm (0.4 mg/m³) [skin]</p> <p>OSHA PEL: TWA 0.05 ppm (0.4 mg/m³)</p> <p>IDLH: 2 mg/m³</p>
<p>Cobalt Odorless, silver-gray to black solid</p>	<p>Noncombustible Solid in bulk form, but finely divided dust will burn at high temperatures.</p> <p>Symptoms: cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; respiratory hypersensitivity, asthma</p>	<p>NIOSH REL: TWA 0.05 mg/m³ (dust)</p> <p>OSHA PEL: TWA 0.1 mg/m³ (dust)</p> <p>IDLH: 20 mg/m³</p>
<p>Copper (dusts and mists) Metal: Reddish, lustrous, malleable, odorless solid. As dusts and mists, finely divided black particulate dispersed in air</p>	<p>Noncombustible Solid in bulk form, but powdered form may ignite.</p> <p>Exposure routes: inhalation, ingestion, skin and/or eye contact.</p> <p>Symptoms: irritation eyes, pharynx; nasal septum perforation</p>	<p>NIOSH REL: TWA 1 mg/ m³</p> <p>OSHA PEL: 1 mg/m³</p> <p>IDLH: 100 mg/m³</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Chromium (metal) Blue-white to steel-gray, lustrous, brittle, hard, odorless solid</p>	<p>Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.</p> <p>Symptoms: irritation eyes, skin; lung fibrosis (histologic)</p>	<p>NIOSH REL: TWA 0.5 mg/m³</p> <p>OSHA PEL: TWA 1 mg/m³</p> <p>IDLH: 250 mg/m³</p>
<p>Cyclotetramethylenetetranitramine (HMX) Colorless solid; explosive</p>	<p>None found.</p> <p>Animal studies suggest potential effects on liver and central nervous system</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Cyclotrimethylenetrinitramine (RDX) (Cyclonite) White, crystalline powder, explosive</p>	<p>Symptoms: irritation of eyes, skin; headache, irritability, lassitude (weakness, exhaustion), tremor, nausea, dizziness, vomiting, insomnia, convulsions</p>	<p>NIOSH REL: 1.5 mg/m³ 3 mg/ m³ (STEL) (skin)</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Dinitrotoluene (DNT) Orange-yellow crystalline solid with a characteristic odor (often shipped molten)</p>	<p>Symptoms: anoxia, cyanosis; anemia, jaundice; [potential occupational carcinogen]</p>	<p>NIOSH REL: Carcinogen 1.5 mg/m³ (skin)</p> <p>OSHA PEL: 1.5 mg/m³ (skin)</p> <p>IDLH: Carcinogen [50 mg/m³]</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Hexachloroethane Colorless crystals with a camphor-like odor</p>	<p>Noncombustible solid.</p> <p>Exposure routes: inhalation, skin absorption, ingestion, skin and/or eye contact</p> <p>Symptoms: irritation eyes, skin, mucous membrane; in animals: kidney damage; [potential occupational carcinogen]</p>	<p>NIOSH REL: Ca TWA 1 ppm (10 mg/m³) [skin]</p> <p>OSHA PEL: TWA 1 ppm (10 mg/m³) [skin]</p> <p>IDLH: Ca [300 ppm]</p>
<p>Iron (metal) (sub-component of Thermite) Silvery white or gray soft solid; black to gray in powder form</p>	<p>Noncombustible solid. Dusts and fine particles are flammable.</p> <p>Exposure routes: inhalation, ingestion, skin and/or eye contact</p> <p>Symptoms: possible irritation eyes, skin, respiratory system</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Iron oxide (sub-component of Thermite) Reddish-brown solid, “rust” form of iron</p>	<p>Noncombustible solid.</p> <p>Symptoms: benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)</p>	<p>NIOSH REL: TWA 5 mg/m³</p> <p>OSHA PEL: TWA 10 mg/m³</p> <p>IDLH: 2500 mg/m³</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Lead (metal) A heavy, ductile, soft, gray solid</p>	<p>Noncombustible solid in bulk form.</p> <p>Exposure routes: inhalation, ingestion, skin and/or eye contact</p> <p>Symptoms: lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension</p>	<p>NIOSH REL: TWA 0.050 mg/m³</p> <p>OSHA PEL: TWA 0.050 mg/m³</p> <p>IDLH: 100 mg/m³</p>
<p>Lead azide An odorless, colorless or buff powder color solid</p>	<p>Detonates but does not burn.</p> <p>Exposure routes: Inhalation</p> <p>Symptoms: irritation of eyes; headache, irritability; reduced memory, sleep disturbance; potential kidney and brain damage</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Lead chromate Yellow to orange powder</p>	<p>Stable. Reacts violently with ferric ferrocyanide.</p> <p>Toxic by inhalation and ingestion. Possible carcinogen.</p> <p>Symptoms: Irritation of eyes, skin, mucous membrane; lung damage, blood disorders, stomach ulcers</p>	<p>NIOSH REL: 0.001 mg/m³ C (as chromate)</p> <p>OSHA PEL: 0.1 mg/m³ C (as chromate)</p> <p>ACGIH TLV: 0.05 mg/m³ (as chromate)</p> <p>IDLH: Ca; 15 mg/m³ (as chromate)</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Lead styphnate Orange to dark brown crystals</p>	<p>Detonates; does not burn.</p> <p>Exposure routes: Inhalation, ingestion, absorption</p> <p>Symptoms: irritation of throat, coughing, phlegm, irritation and reddening of skin and eyes. May cause lead poisoning.</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Lead thiocyanate White to yellow crystalline powder</p>	<p>Toxic by ingestion.</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Magnesium (metal) Silvery, hard solid</p>	<p>Flammable solid; powder may ignite spontaneously on contact with water.</p> <p>Exposure routes: Inhalation, ingestion, absorption</p> <p>Symptoms: dust may cause irritation of eyes and respiratory track; coughing, chest pain, and fever</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Manganese A lustrous, brittle, silvery solid</p>	<p>Combustible solid.</p> <p>Exposure routes: inhalation, ingestion</p> <p>Symptoms: Parkinson's; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage</p>	<p>NIOSH REL: TWA 1 mg/m³ ST 3 mg/m³</p> <p>OSHA PEL: C 5 mg/m³</p> <p>IDLH: 500 mg/m³</p>
<p>Molybdenum Dark gray or black powder with a metallic luster</p>	<p>Combustible solid in form of dust or powder. Strong oxidizers.</p> <p>Exposure routes: inhalation, ingestion, skin and/or eye contact</p> <p>Symptoms: lung damage, effects central nervous system</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: TWA 15 mg/m³</p> <p>IDLH: 5000 mg/m³</p>
<p>Nickel Metal: Lustrous, silvery, odorless solid</p>	<p>Combustible solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.</p> <p>Symptoms: sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]</p>	<p>NIOSH REL: Ca TWA 0.015 mg/m³</p> <p>OSHA PEL: TWA 1 mg/m³</p> <p>IDLH: Ca [10 mg/m³ (as Ni)]</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Nitrocellulose (gun cotton) Odorless, white substance. Yellowish-white, matted mass of filaments with appearance of raw cotton</p>	<p>Combustible solid</p> <p>Symptoms: irritation eyes, skin, mucous membrane</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Nitrocellulose (solution); Collodion; pyroxylin solution; alcohol-ether solution Clear, colorless, syrupy liquid, characteristic fruity odor</p>	<p>Stable but flammable; avoid contact with acids and oxidizing agents.</p> <p>Exposure routes: inhalation, ingestion, and skin contact</p> <p>Symptoms: irritation to respiratory tract, may cause narcosis, headache, fatigue, cough, nausea, dizziness, skin irritation, redness and pain</p>	<p>NIOSH REL None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Nitroglycerine Colorless to pale-yellow, viscous liquid or solid (below 56 °F)</p>	<p>Explosive liquid.</p> <p>Exposure routes: inhalation, skin absorption, ingestion, skin and/or eye contact</p> <p>Symptoms: throbbing headache; dizziness; nausea, vomiting, abdominal pain; hypotension; flush; palpitations; methemoglobinemia; delirium, central nervous system depression; angina; skin irritation</p>	<p>NIOSH REL: ST 0.1 mg/m³ [skin]</p> <p>OSHA PEL: C 0.2 ppm (2 mg/m³) [skin]</p> <p>IDLH: 75 mg/m³</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Pentaerythritoltetranitrate (PETN) Colorless to white, crystalline, odorless powder</p>	<p>Combustible solid.</p> <p>Symptoms: irritation of eyes and respiratory system; headache, weakness, and drop in blood pressure</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Phosphorous (white or yellow) White to yellow, soft, waxy solid with acrid fumes (usually stored or shipped in water)</p>	<p>Symptoms: irritation of eyes, respiratory tract; eye, skin burns; abdominal pain, nausea, jaundice; anemia; cachexia (general ill health and malnutrition); dental pain, salivation, jaw pain, swelling</p>	<p>NIOSH REL: 0.1 mg/m³</p> <p>OSHA PEL: 0.1 mg/m³</p> <p>IDLH: 5 mg/m³</p>
<p>Potassium chlorate Odorless, white powder or crystals</p>	<p>Strong oxidizer, contact with other materials may cause fire.</p> <p>Exposure routes: inhalation, skin absorption, ingestion, skin and/or eye contact</p> <p>Symptoms: irritation to respiratory tract, coughing, shortness of breath, irritation to gastrointestinal tract, nausea, vomiting, diarrhea, abdominal pain, hemolysis, methemoglobinemia, coma, convulsions, liver and kidney damage, irritation to skin/eye, redness and pain</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Potassium nitrate Transparent, colorless, odorless crystals</p>	<p>Powerful oxidizer.</p> <p>Symptoms: moderately toxic through ingestion, chronic exposure can lead to anemia, nephritis, methemoglobinemia</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Potassium perchlorate Odorless, white powder</p>	<p>Strong oxidizer, contact with other materials may cause fire, severe irritant.</p> <p>Exposure routes: inhalation, skin absorption, ingestion, skin and/or eye contact</p> <p>Symptoms: ringing in ears, dizziness, blurred vision, irritation to respiratory tract, coughing, shortness of breath, irritation to gastrointestinal tract, irritant to mucous membrane, pulmonary edema, nausea, fever, vomiting, rashes, reduces oxygen to body organs causing lips and skin to turn blue, kidney damage, redness, itching, and pain</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Red phosphorous Violet-red, amorphous solid</p>	<p>Low toxicity</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Sodium nitrate Transparent, odorless, colorless crystals</p>	<p>Powerful oxidizer, will ignite with flame or heat</p> <p>Symptoms: can be poisonous intravenously, moderately toxic through ingestion</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Strontium (metal) Pale yellow, soft solid</p>	<p>Reacts with water; powder reacts with air.</p> <p>Exposure routes: inhalation, ingestion, absorption</p> <p>Symptoms: coughing, sneezing, difficult breathing, vomiting, diarrhea, redness of skin and eyes and possible severe tissue burns</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Strontium nitrate Odorless, white powder or granules</p>	<p>Non flammable, but very strong oxidizer.</p> <p>Exposure routes: inhalation, ingestion, and absorption</p> <p>Symptoms: coughing, sneezing, difficulty breathing, vomiting, diarrhea, redness of skin and eyes, and possible tissue burn</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Sulfur (sub-component of Thermite) Yellow crystals or yellow powder</p>	<p>Flammable solid.</p> <p>Symptoms: irritation to eyes, skin, and respiratory system. Poison through ingestion and intravenously</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Tetracene (Naphthacene) Orange solid</p>	<p>Explodes when heated. Reacts with oxidizers.</p>	<p>NIOSH REL: None established OSHA PEL: None established IDLH: Not determined</p>
<p>Tetranitrocarbazole</p>	<p>Explosive</p>	<p>NIOSH REL: None established OSHA PEL: None established IDLH: Not determined</p>
<p>Tin Gray to almost silver-white, ductile, malleable, lustrous solid</p>	<p>Noncombustible solid, but powdered form may ignite.</p> <p>Exposure routes: inhalation, skin and/or eye contact</p> <p>Symptoms: irritation eyes, skin, respiratory system; in animals: vomiting, diarrhea, paralysis with muscle twitching</p>	<p>NIOSH REL: TWA 2 mg/m³ OSHA PEL: TWA 2 mg/m³ IDLH: 100 mg/m³</p>
<p>Titanium Silvery solid, or dark gray amorphous powder</p>	<p>Stable, low toxicity.</p> <p>Dust or powder may form an explosive mixture with air. Flammable. Incompatible with mineral acids, halogens, carbon dioxide, strong oxidizing agents.</p> <p>Symptoms: harmful if inhaled. Dust is an eye irritant</p>	<p>NIOSH REL: None established OSHA PEL: None established IDLH: Not determined</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Triacetin (Glyceryl triacetate) Colorless, oily, liquid</p>	<p>Combustible when exposed to heat, flame, and powerful oxidizers.</p> <p>Symptoms: Poison by ingestion, moderately toxic intravenously, eye irritant</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Trinitrophenylmethylnitramine (tetryl) Colorless to yellow, odorless crystalline solid, explosive</p>	<p>Sensitization dermatitis, itch, erythema (skin redness); edema on nasal folds, cheeks, neck; keratitis (inflammation of the cornea); sneezing; anemia; cough, coryza; irritability; malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion), insomnia; nausea, vomiting; liver and kidney damage</p>	<p>NIOSH REL: 1.5 mg/m³ (skin)</p> <p>OSHA PEL: 1.5 mg m³ (skin)</p> <p>IDLH: 750 mg/m³ (skin)</p>
<p>2,4,6-Trinitrotoluene (TNT) Colorless to pale-yellow, odorless solid or crushed flakes</p>	<p>Combustible solid (Class A Explosive)</p> <p>Exposure routes: inhalation, sin absorption, ingestion, skin and/or eye contact</p> <p>Symptoms: irritation skin, mucous membrane; liver damage, jaundice; cyanosis; sneezing; cough, sore throat; peripheral neuropathy, muscle pain; kidney damage; cataract; sensitization dermatitis; leukocytosis (increased blood leukocytes); anemia; cardiac irregularities</p>	<p>NIOSH REL: TWA 0.5 mg/m³ [skin]</p> <p>OSHA PEL: TWA 1.5 mg/m³ [skin]</p> <p>IDLH: 500 mg/m³</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
<p>Vanadium (metal) Bright white, soft, ductile metal</p>	<p>Flammable in dust form from heat, flame, or spark.</p> <p>Exposure routes: poison by subcutaneous route</p>	<p>NIOSH REL: Dust: TWA 1.0 mg/m³ ; C 0.05 mg/m³ as V (15 min)</p> <p>OSHA PEL: 0.5 mg/ m³ respirable; as V2O5</p> <p>IDLH: Not provided</p>
<p>Zinc (metal) Shiny white solid with blue-gray luster</p>	<p>Low toxicity.</p>	<p>NIOSH REL: None established</p> <p>OSHA PEL: None established</p> <p>IDLH: Not determined</p>
<p>Zinc oxide White, odorless solid</p>	<p>Fumes: Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function</p>	<p>NIOSH REL: Dust: 5 mg/m³ 15 mg/m³ (C; 15-min) Fume: 5 mg/m³ 10 mg/m³ (STEL)</p> <p>OSHA PEL: Dust: 15 mg/m³ (total dust); 5 mg/m³ (respirable dust) Fume: 5 mg/m³</p> <p>IDLH: 500 mg/m³</p>
<p>Zirconium hydride Black-gray, metallic powder</p>	<p>Strong reducing agent.</p> <p>Symptoms: Skin, lung granulomas</p>	<p>NIOSH REL: TWA 5 mg/m³ ; ST 10 mg/m³</p> <p>OSHA PEL: TWA 5 mg/m³</p> <p>IDLH: 50 mg/m³ (as Zr)</p>

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Chemical Hazards Associated with UXO/MEC		
Chemical / Physical Description	Hazard	PEL/REL
IDLH = immediately dangerous to life or health concentration mg/m ³ = milligrams per cubic meter of air NIOSH = National Institute for Occupational Safety and Health PEL = OSHA Permissible Exposure Limit REL = NIOSH Recommended Exposure Limit	OSHA = Occupational Safety and Health Administration TWA = Time Weighted Average C indicates a ceiling REL Ca indicates a potential occupational carcinogen “Skin” = potential for dermal absorption ST= STEL = Short-term exposure limit	LFC = lowest feasible concentration ACGIH TLV = Threshold Limit Value ACGIH = American Conference of Governmental Industrial Hygienists

ATTACHMENT 2

**UNITED STATES ARMY CORPS OF ENGINEERS
ACCIDENT INVESTIGATION REPORT**

11. CAUSAL FACTOR(S) (Read Instruction Before Completing)					
a. (Explain YES answers in item 13)	YES	NO	a. (CONTINUED)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	<input type="checkbox"/>	<input type="checkbox"/>	CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	<input type="checkbox"/>	<input type="checkbox"/>
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	<input type="checkbox"/>	<input type="checkbox"/>	OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	<input type="checkbox"/>	<input type="checkbox"/>	SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	<input type="checkbox"/>	<input type="checkbox"/>
OPERATING PROCEDURES: Were operating procedures a factor?	<input type="checkbox"/>	<input type="checkbox"/>	PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	<input type="checkbox"/>	<input type="checkbox"/>	DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident?	<input type="checkbox"/>	<input type="checkbox"/>
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	<input type="checkbox"/>	<input type="checkbox"/>	b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?		
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> YES (If yes, attach a copy.)	<input type="checkbox"/> NO	

12. TRAINING		
a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? <input type="checkbox"/> YES <input type="checkbox"/> NO	b. TYPE OF TRAINING. <input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB	c. DATE OF MOST RECENT FORMAL TRAINING. (Month) (Day) (Year)

13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)	
a. DIRECT CAUSE	
b. INDIRECT CAUSE(S)	

14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).	
DESCRIBE FULLY:	

15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.					
a. BEGINNING (Month/Day/Year)			b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT		d. DATE (Mo/Da/Yr)	e. ORGANIZATION IDENTIFIER (Div, Br, Sect)	f. OFFICE SYMBOL	
CORPS _____					
CONTRACTOR _____					

16. MANAGEMENT REVIEW (1st)		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. COMMENTS
SIGNATURE	TITLE	DATE

17. MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. COMMENTS
SIGNATURE	TITLE	DATE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW		
a. <input type="checkbox"/> CONCUR	b. <input type="checkbox"/> NON CONCUR	c. ADDITIONAL ACTIONS/COMMENTS
SIGNATURE	TITLE	DATE

19. COMMAND APPROVAL	
COMMENTS	
COMMANDER SIGNATURE	DATE

10. ACCIDENT DESCRIPTION *(Continuation)*

13a. DIRECT CAUSE *(Continuation)*

13b.

INDIRECT CAUSES *(Continuation)*

14.

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

GENERAL. Complete a separate report for each person who was injured, caused, or contributed to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16 and 17.

INSTRUCTIONS FOR SECTION 1 – ACCIDENT CLASSIFICATION. (Mark All Boxes That Are Applicable.)

- a. GOVERNMENT. Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.
 - (1) INJURY/ILLNESS/FATALITY – Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.
 - (2) PROPERTY DAMAGE – Mark the appropriate box if accident resulted in any damage of \$1000 or more to government property (including motor vehicles).
 - (3) VEHICLE INVOLVED – Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) DIVING ACTIVITY – Mark if the accident involved an in-house USACE diving activity.
- b. CONTRACTOR.
 - (1) INJURY/ILLNESS/FATALITY – Mark if accident resulted in any contractor lost-time injury/illness or fatality.
 - (2) PROPERTY DAMAGE – Mark the appropriate box if accident resulted in any damage of \$1000 or more to contractor property (including motor vehicles).
 - (3) VEHICLE INVOLVED – Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
 - (4) DIVING ACTIVITY – Mark if the accident involved a USACE Contractor diving activity.
- c. PUBLIC.
 - (1) INJURY/ILLNESS/FATALITY – Mark if accident resulted in public fatality or permanent total disability. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).
 - (2) VOID SPACE – Make no entry.
 - (3) VEHICLE INVOLVED – Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" is marked.
 - (4) VOID SPACE – Make no entry.

INSTRUCTIONS FOR SECTION 2 – PERSONAL DATA

- a. NAME – (MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.
- b. AGE – Enter age.
- c. SEX – Mark appropriate box.
- d. SOCIAL SECURITY NUMBER – (FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).
- e. GRADE – (FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: O-6; E-7; WG-8; WS-12; GS-11; etc.

- f. JOB SERIES/TITLE – For government civilian employees enter the pay plan, full series number, and job title, e.g. GS-0810/Civil Engineer. For military personnel enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11G50. For contractor employees enter the job title assigned to the injured person, e.g. carpenter, laborer, surveyor, etc.,
- g. DUTY STATUS – Mark the appropriate box.
 - (1) ON DUTY – Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.
 - (2) TDY - Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.
 - (3) OFF DUTY - Person was not on official business at time of accident
- h. EMPLOYMENT STATUS – (FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTION FOR SECTION 3 – GENERAL INFORMATION

- a. DATE OF ACCIDENT – Enter the month, day, and year of accident.
- b. TIME OF ACCIDENT – Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).
- c. EXACT LOCATION OF ACCIDENT – Enter facts needed to locate the accident scene. (installation/project name, building number, street, direction and distance from closest landmark, etc.,).
- d. CONTRACTOR NAME
 - (1) PRIME – Enter the exact name (title of firm) of the prime contractor.
 - (2) SUBCONTRACTOR – Enter the name of any subcontractor involved in the accident.
- e. CONTRACT NUMBER – Mark the appropriate box to identify if contract is civil works, military, or other: if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.
- f. TYPE OF CONTRACT – Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
- g. HAZARDOUS/TOXIC WASTE ACTIVITY (HTW) – Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUDS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 – CONSTRUCTION ACTIVITIES

- a. CONSTRUCTION ACTIVITY – Select the most appropriate construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

- | | |
|-------------------------|----------------------------|
| 1. MOBILIZATION | 14. ELECTRICAL |
| 2. SITE PREPARATION | 15. SCAFFOLDING/ACCESS |
| 3. EXCAVATION/TRENCHING | 16. MECHANICAL |
| 4. GRADING (EARTHWORK) | 17. PAINTING |
| 5. PIPING/UTILITIES | 18. EQUIPMENT/MAINTENANCE |
| 6. FOUNDATION | 19. TUNNELING |
| 7. FORMING | 20. WAREHOUSING/STORAGE |
| 8. CONCRETE PLACEMENT | 21. PAVING |
| 9. STEEL ERECTION | 22. FENCING |
| 10. ROOFING | 23. SIGNING |
| 11. FRAMING | 24. LANDSCAPING/IRRIGATION |
| 12. MASONRY | 25. INSULATION |
| 13. CARPENTRY | 26. DEMOLITION |

b. TYPE OF CONSTRUCTION EQUIPMENT—Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER", and write in specific type of equipment.

CONSTRUCTION EQUIPMENT

- | | |
|------------------------------------|--------------------------------|
| 1. GRADER | 13. DUMP TRUCK (OFF HIGHWAY) |
| 2. DRAGLINE | 14. TRUCK (OTHER) |
| 3. CRANE (ON VESSEL/BARGE) | 15. FORKLIFT |
| 4. CRANE (TRACKED) | 16. BACKHOE |
| 5. CRANE (RUBBER TIRE) | 17. FRONT-END LOADER |
| 6. CRANE (VEHICLE MOUNTED) | 18. PILE DRIVER |
| 7. CRANE (TOWER) | 19. TRACTOR (UTILITY) |
| 8. SHOVEL | 20. MANLIFT |
| 9. SCRAPER | 21. DOZER |
| 10. PUMP TRUCK (CONCRETE) | 22. DRILL RIG |
| 11. TRUCK (CONCRETE/TRANSIT MIXER) | 23. COMPACTOR/VIBRATORY ROLLER |
| 12. DUMP TRUCK (HIGHWAY) | 24. OTHER |

INSTRUCTIONS FOR SECTION 5—INJURY/ILLNESS INFORMATION

a. SEVERITY OF INJURY / ILLNESS - Reference para 2-10 of USACE Suppl 1 to AR 385-40 and enter code and description from list below.

- NOI NO INJURY
- FAT FATALITY
- PTL PERMANENT TOTAL DISABILITY
- PPR PERMANENT PARTIAL DISABILITY
- LWD LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK
- NLW RECORDABLE CASE WITHOUT LOST WORKDAYS
- RFA RECORDABLE FIRST AID CASE
- NRI NON-RECORDABLE INJURY

b. ESTIMATED DAYS LOST—Enter the estimated number of workdays the person will lose from work.

c. ESTIMATED DAYS HOSPITALIZED—Enter the estimated number of workdays the person will be hospitalized.

d. ESTIMATED DAYS RESTRICTED DUTY—Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.

e. BODY PART AFFECTED—Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	CB	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW
	CL	THROAT, LARYNX
	CM	MOUTH

	CN	NOSE
	CR	THROAT, OTHER
	CT	TONGUE
	CZ	HEAD OTHER INTERNAL
ELBOW	EB	BOTH ELBOWS
	ES	SINGLE ELBOW
FINGER	F1	FIRST FINGER
	F2	BOTH FIRST FINGERS
	F3	SECOND FINGER
	F4	BOTH SECOND FINGERS
	F5	THIRD FINGER
	F6	BOTH THIRD FINGERS
	F7	FOURTH FINGER
	F8	BOTH FOURTH FINGERS
TOE	G1	GREAT TOE
	G2	BOTH GREAT TOES
	G3	TOE OTHER
	G4	TOES OTHER
HEAD, EXTERNAL	H1	EYE EXTERNAL
	H2	BOTH EYES EXTERNAL
	H3	EAR EXTERNAL
	H4	BOTH EARS EXTERNAL
	HC	CHIN
	HF	FACE
	HK	NECK/THROAT
	HM	MOUTH/LIPS
	HN	NOSE
	HS	SCALP
KNEE	KB	BOTH KNEES
	KS	KNEE
LEG, HIP, ANKLE, BUTTOCK	LB	BOTH LEGS/HIPS/ANKLES/BUTTOCKS
	LS	SINGLE LEG/HIP ANKLE/BUTTOCK
HAND	MB	BOTH HANDS
	MS	SINGLE HAND
FOOT	PB	BOTH FEET
	PS	SINGLE FOOT
TRUNK, BONES	R1	SINGLE COLLAR BONE
	R2	BOTH COLLAR BONES
	R3	SHOULDER BLADE
	R4	BOTH SHOULDER BLADES
	RB	RIB
	RS	STERNUM (BREAST BONE)
	RV	VERTEBRAE (SPINE; DISC)
	RZ	TRUNK BONES OTHER
SHOULDER	SB	BOTH SHOULDERS
	SS	SINGLE SHOULDER
THUMB	TB	BOTH THUMBS
	TS	SINGLE THUMB
TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	V2	LUNGS, BOTH
	V3	KIDNEY, SINGLE
	V4	KIDNEYS, BOTH
	VH	HEART
	VL	LIVER
	VR	REPRODUCTIVE ORGANS
	VS	STOMACH
	VV	INTESTINES
	VZ	TRUNK, INTERNAL; OTHER

f. NATURE OF INJURY/ILLNESS - Select the most appropriate nature of injury / illness from the list below. This nature of injury / illness shall correspond to the primary body part selected in 5e, above. Enter the nature of injury / illness name on the line and place the corresponding CODE letters in the box provided.

* The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
*TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION
	TB	BACK STRAIN.
	TC	CONTUSION; BRUISE; ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
	TQ	TRAUMATIC FOOD POISONING
	TW	TRAUMATIC TUBERCULOSIS
	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC DISEASE
	T1	TRAUMATIC CEREBRAL VASCULAR CONDITION/STROKE
	T2	TRAUMATIC HEARING LOSS
T3	TRAUMATIC HEART CONDITION	
T4	TRAUMATIC MENTAL DISORDER; STRESS; NERVOUS CONDITION	
T8	TRAUMATIC INJURY — OTHER (EXCEPT DISEASE, ILLNESS)	

**A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which does not meet the definition of traumatic injury or disability as described above.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME	
**NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY			
RESPIRATORY DISEASE	RA	ASBESTOSIS	
	RB	BRONCHITIS	
	RE	EMPHYSEMA	
	RP	PNEUMOCONIOSIS	
	RS	SILICOSIS	
	R9	RESPIRATORY DISEASE, OTHER	
	VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
		VC	COCCIDIOMYCOSIS
		VF	FOOD POISONING
VH		HEPATITIS	
VM		MALARIA	
VS		STAPHYLOCOCCUS	
VT		TUBERCULOSIS	
V9		VIROLOGICAL/INFECTIVE/ PARASITIC—OTHER	
DISABILITY, OCCUPATIONAL		DA	ARTHRITIS, BURSITIS
	DB	BACK STRAIN, BACK SPRAIN	
	DC	CEREBRAL VASCULAR CONDITION; STROKE	
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES R&S)	
	DE	EFFECT OF ENVIRONMENTAL CONDITION	
	DH	HEARING LOSS	
	DK	HEART CONDITION	
	DM	MENTAL DISORDER, EMOTIONAL STRESS NERVOUS CONDITION	
	DR	RADIATION	
	DS	STRAIN, MULTIPLE	
	DU	ULCER	
	DV	OTHER VASCULAR CONDITIONS	
	D9	DISABILITY, OTHER	

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
SKIN DISEASE OR CONDITION	SB	BIOLOGICAL
	SC	CHEMICAL
	S9	DERMATITIS, UNCLASSIFIED

g. TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and Source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples:

(1) An employee tripped on carpet and struck his head on a desk.
TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/ oak.
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliver while grinding a turbine blade.
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.
TYPE: 800 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 800, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT BY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0800	TRAVELING IN
CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOILER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

CODE	SOURCE OF INJURY NAME
0200	ENVIRONMENTAL CONDITION
0210	TEMPERATURE EXTREME (INDOOR)
0220	WEATHER (ICE, RAIN, HEAT, ETC.)
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)
0240	NOISE
0250	RADIATION
0260	LIGHT
0270	VENTILATION
0271	TOBACCO SMOKE
0280	STRESS (EMOTIONAL)
0290	CONFINED SPACE
0300	MACHINE OR TOOL
0310	HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320	HAND TOOL (NONPOWERED)
0330	MECHANICAL POWER TRANSMISSION APPARATUS
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350	VIDEO DISPLAY TERMINAL
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370	HEATING EQUIPMENT
0380	WELDING EQUIPMENT
0400	VEHICLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421	DRIVER OF GOVERNMENT VEHICLE
0422	PASSENGER OF GOVERNMENT VEHICLE
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)
0440	AIRCRAFT (NOT COMMERCIAL)
0450	BOAT, SHIP, BARGE
0500	MATERIAL HANDLING EQUIPMENT
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540	HOIST, SLING CHAIN, JACK
0550	CRANE
0551	FORKLIFT
0560	HANDTRUCK, DOLLY
0600	DUST, VAPOR, ETC.
0610	DUST (SILICA, COAL, ETC.)
0620	FIBERS
0621	ASBESTOS
0630	GASES
0631	CARBON MONOXIDE
0640	MIST, STEAM, VAPOR, FUME
0641	WELDING FUMES
0650	PARTICLES (UNIDENTIFIED)
0700	CHEMICAL, PLASTIC, ETC.
0711	DRY CHEMICAL—CORROSIVE
0712	DRY CHEMICAL—TOXIC
0713	DRY CHEMICAL—EXPLOSIVE
0714	DRY CHEMICAL—FLAMMABLE
0721	LIQUID CHEMICAL—CORROSIVE
0722	LIQUID CHEMICAL—TOXIC
0723	LIQUID CHEMICAL—EXPLOSIVE
0724	LIQUID CHEMICAL—FLAMMABLE
0730	PLASTIC
0740	WATER
0750	MEDICINE
0800	INANIMATE OBJECT
0810	BOX, BARREL, ETC.
0820	PAPER
0830	METAL ITEM, MINERAL
0831	NEEDLE
0840	GLASS
0850	SCRAP, TRASH
0860	WOOD
0870	FOOD
0880	CLOTHING, APPAREL, SHOES
0900	ANIMATE OBJECT
0911	DOG
0912	OTHER ANIMAL
0920	PLANT
0930	INSECT
0940	HUMAN (VIOLENCE)
0950	HUMAN (COMMUNICABLE DISEASE)
0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE	SOURCE OF INJURY NAME
1000	PERSONAL PROTECTIVE EQUIPMENT
1010	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020	RESPIRATOR, MASK
1021	DIVING EQUIPMENT
1030	SAFETY BELT, HARNESS
1040	PARACHUTE

INSTRUCTIONS FOR SECTION 6 — PUBLIC FATALITY

- a. **ACTIVITY AT TIME OF ACCIDENT**—Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the *most* appropriate primary activity area (water related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

- | | |
|-----------------------------------|--|
| 1. Sailing | 9. Swimming/designated area |
| 2. Boating—powered | 10. Swimming/other area |
| 3. Boating—unpowered | 11. Underwater activities (skin diving, scuba, etc.) |
| 4. Water skiing | 12. Wading |
| 5. Fishing from boat | 13. Attempted rescue |
| 6. Fishing from bank dock or pier | 14. Hunting from boat |
| 7. Fishing while wading | 15. Other |
| 8. Swimming/supervised area | |

NON-WATER RELATED RECREATION

- | | |
|--|---|
| 16. Hiking and walking | 23. Sports/summer (baseball, football, etc.) |
| 17. Climbing (general) | 24. Sports/winter (skiing, sledding, snowmobiling etc.) |
| 18. Camping/picnicking authorized area | 25. Cycling (bicycle, motorcycle, scooter) |
| 19. Camping/picnicking unauthorized area | 26. Gliding |
| 20. Guided tours | 27. Parachuting |
| 21. Hunting | 28. Other non-water related |
| 22. Playground equipment | |

OTHER ACTIVITIES

- | | |
|--|----------------------------------|
| 29. Unlawful acts (fights, riots, vandalism, etc.) | 33. Sleeping |
| 30. Food preparation/serving | 34. Pedestrian struck by vehicle |
| 31. Food consumption | 35. Pedestrian other acts |
| 32. Housekeeping | 36. Suicide |
| | 37. "Other" activities |

- b. **PERSONAL FLOTATION DEVICE USED**—If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7 — MOTOR VEHICLE ACCIDENT

- a. **TYPE OF VEHICLE**—Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.
- b. **TYPE OF COLLISION**—Mark appropriate box.
- c. **SEAT BELT**—Mark appropriate box.

INSTRUCTIONS FOR SECTION 8 — PROPERTY/ MATERIAL INVOLVED

- a. **NAME OF ITEM**—Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.
- b. **OWNERSHIP**—Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE*)
- c. **\$ AMOUNT OF DAMAGE**—Enter the total estimated dollar amount of damage (parts and labor), if any.

INSTRUCTIONS FOR SECTION 9—VESSEL/ FLOATING PLANT ACCIDENT

- a. TYPE OF VESSEL/FLOATING PLANT—Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/floating plant.

VESSEL/FLOATING PLANTS

- | | |
|------------------------|-----------------------------|
| 1. ROW BOAT | 7. DREDGE/DIPPER |
| 2. SAIL BOAT | 8. DREDGE/CLAMSHELL. BUCKET |
| 3. MOTOR BOAT | 9. DREDGE/PIPE LINE |
| 4. BARGE | 10. DREDGE/DUST PAN |
| 5. DREDGE/HOPPER | 11. TUG BOAT |
| 6. DREDGE/SIDE CASTING | 12. OTHER |

- b. COLLISION/MISHAP—Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

- | | |
|-----------------------------|-----------------------|
| 1. COLLISION W/OTHER VESSEL | 7. HAULAGE UNIT |
| 2. UPPER GUIDE WALL | 8. BREAKING TOW |
| 3. UPPER LOCK GATES | 9. TOW BREAKING UP |
| 4. LOCK WALL | 10. SWEEP DOWN ON DAM |
| 5. LOWER LOCK GATES | 11. BUOY/DOLPHIN/CELL |
| 6. LOWER GUIDE WALL | 12. WHARF OR DOCK |
| | 13. OTHER |

INSTRUCTIONS FOR SECTION 10—ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT—Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

INSTRUCTIONS FOR SECTION 11—CAUSAL FACTORS

- a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:

- (1) DESIGN—Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) INSPECTION/MAINTENANCE—Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) PERSON'S PHYSICAL CONDITION—Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?
- (4) OPERATING PROCEDURES—Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) JOB PRACTICES—Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

- (6) HUMAN FACTORS—Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
 - (7) ENVIRONMENTAL FACTORS—Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc., play a part in the accident?
 - (8) CHEMICAL AND PHYSICAL AGENT FACTORS—Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?
 - (9) OFFICE FACTORS—Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
 - (10) SUPPORT FACTORS—Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc?
 - (11) PERSONAL PROTECTIVE EQUIPMENT—Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?
 - (12) DRUGS/ALCOHOL—Is there any reason to believe the person's mental or physical capabilities, judgement, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".
- b. WRITTEN JOB/ACTIVITY HAZARD ANALYSIS—Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. *If one was performed, attach a copy of the analysis to the report.*

INSTRUCTIONS FOR SECTION 12—TRAINING

- WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?—For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.
- TYPE OF TRAINING—Mark the appropriate box that best indicates the type of training; (classroom or on-the-job) that the injured person received before the accident happened.
- DATE OF MOST RECENT TRAINING—Enter the month, day, and year of the last *formal* training completed that covered the activity-task being performed at the time of the accident.

INSTRUCTIONS FOR SECTION 13 – CAUSES

- a. **DIRECT CAUSES**—The direct cause is that single factor which most directly lead to the accident. See examples below.
- b. **INDIRECT CAUSES**—Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

- a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: failure to provide fall protection at elevation.
Indirect causes: failure to enforce USACE safety requirements; improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.
- b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (note USACE vehicle was in proper/safe working condition).
Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.
Indirect cause: Failure of employee to pay attention to driving (defensive driving).

INSTRUCTIONS FOR SECTION 14 – ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION—Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15 – DATES FOR ACTION

- a. **BEGIN DATE**—Enter the date when the corrective action(s) identified in Section 14 will begin.
- b. **COMPLETE DATE**—Enter the date when the corrective action(s) identified in Section 14 will be completed.
- c. **TITLE AND SIGNATURE**—Enter the title and signature of supervisor completing the accident report. For a **GOVERNMENT** employee accident/illness the immediate supervisor will complete and sign the report. For **PUBLIC** accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For **CONTRACTOR** accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE Supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.
- d. **DATE SIGNED**—Enter the month, day, and year that the report was signed by the responsible supervisor.
- e. **ORGANIZATION NAME**—For **GOVERNMENT** employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For **PUBLIC** accidents enter the USACE organization name for the person identified in block 15.c. For **CONTRACTOR** accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

- f. **OFFICE SYMBOL**—Enter the latest complete USACE Office Symbol for the USACE organization identified in block 15.e.

INSTRUCTIONS FOR SECTION 16 – MANAGEMENT REVIEW (1st)

1ST REVIEW—Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

INSTRUCTIONS FOR SECTION 17 – MANAGEMENT REVIEW (2nd)

2ND REVIEW—The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18 – SAFETY AND OCCUPATIONAL HEALTH REVIEW

3RD REVIEW—The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

INSTRUCTION FOR SECTION 19 – COMMAND APPROVAL

4TH REVIEW—The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.

ATTACHMENT 3

CERTIFICATE OF HAZARD ASSESSMENT

Observation		
Are employees wearing PPE appropriate to tasks? Yes No	Is PPE worn and adjusted properly? Yes No	Is PPE maintained in good condition? Yes No

If no, describe corrective action taken:

I, _____, certify that the above location has been evaluated for potential hazards and the appropriate PPE, and that training has been performed.

Signature of Assessor _____ Date _____

PPE Criteria

*ANSI criteria for protective equipment are as follows:

Protective Equipment	Purchased after July 5, 1994			Purchased before July 5, 1994		
Eye & Face Protection	ANSI	Z87.1	1989	ANSI	Z87.1	1968
Head Protection	ANSI	Z89.1	1986	ANSI	Z89.1	1969
Foot Protection	ANSI	Z41	1991	ANSI	Z41.1	1967

***THIS FORM WAS TAKEN FROM ARIZONA STATE RISK
MANAGEMENT TRAINING HANDOUT FOR OSHA 1910.132 -
PERSONAL PROTECTIVE EQUIPMENT**

Observation		
Are employees wearing PPE appropriate to tasks? Yes No	Is PPE worn and adjusted properly? Yes No	Is PPE maintained in good condition? Yes No

If no, describe corrective action taken:

I, _____, certify that the above location has been evaluated for potential hazards and the appropriate PPE, and that training has been performed.

Signature of Assessor _____ Date _____

PPE Criteria

*ANSI criteria for protective equipment are as follows:

Protective Equipment	Purchased after July 5, 1994			Purchased before July 5, 1994		
Eye & Face Protection	ANSI	Z87.1	1989	ANSI	Z87.1	1968
Head Protection	ANSI	Z89.1	1986	ANSI	Z89.1	1969
Foot Protection	ANSI	Z41	1991	ANSI	Z41.1	1967

***THIS FORM WAS TAKEN FROM ARIZONA STATE RISK
MANAGEMENT TRAINING HANDOUT FOR OSHA 1910.132 -
PERSONAL PROTECTIVE EQUIPMENT**

ATTACHMENT 4

DOCUMENTATION OF PPE TRAINING FORM

DOCUMENTATION OF PPE TRAINING FORM

Date of Training _____

Training Conducted By _____

PPE Covered by Training _____

Employees Attending Training _____

DOCUMENTATION OF PPE TRAINING FORM

Date of Training _____

Training Conducted By _____

PPE Covered by Training _____

Employees Attending Training _____

Appendix D

APPENDIX D

ORDNANCE CONTACT REPORT



**MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
ORDNANCE CONTACT REPORT**

DATE:

TO: Susan Holliday, Sierra Army Depot

FROM: TLI Solutions, Inc.
Jerry Glance, Senior Ordnance Safety Specialist
(916) 761-0399

CC: Young Chong, Project Manager, USACE – Sacramento District
(916) 557-7212

**Gene Barber, Project Manager, TLI Solutions, Inc.
(303) 763-7188**

SUBJECT: Potential Ordnance Hazard

TLI Solutions, Inc. (TLI) has been scoped to conduct a Site Inspection (SI) at Munitions Response (MR) sites at Sierra Army Depot. The scope of work for this effort and associated Work Plan dated April 2007, require that ordnance avoidance procedures be utilized while performing the SI field work. As a result, TLI cannot perform any intrusive operations on partially buried ordnance items found during the SI for Sierra Army Depot. Ordnance is identified to the best of our abilities based on the experience of our ordnance specialists and available historic information. All available information for the identified item(s) will be provided to the installation point of contact in the table below. Decisions regarding the severity of the hazard and the need to call for support from the local Explosive Ordnance Disposal (EOD) unit are the responsibility of Sierra Army Depot. The location of ordnance items are marked using bright pink flagging ribbon and recorded in the team's global positioning system. Ordnance type, locations, quantity, and MGRS (Military Grid Reference System) coordinates are listed below. If additional information is required please contact the TLI ordnance safety specialist as noted below.

MR SITE	ORDNANCE ITEM	LOCATION	QTY	MGRS GRID COORDINATE	DESCRIPTION

Response To Comments

Document Review Record

Document Preparer: TLI Solutions, Inc.

Document Title: Draft Work Plan, Sierra Army Depot Upper Burning Ground

The following provides TLI's response to comments received from Sierra Army Depot (SIAD), U.S. Army Environmental Center (USAEC), The Department of Toxic Substances Control (DTSC), and the U.S. Army Corps of Engineers (USACE), Sacramento District.

Reviewed By: Sierra Army Depot

Reviewer: Susan Holliday

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
1.	Transmittal, Distro list	My new job title is Restoration Manager	Concur. Appropriate changes have been made to the text.
2.	ii, TOC, 2.1.7.1	Correct Bldg number to 349	Concur. Appropriate changes have been made to the text.
3.	ii, TOC, 2.8	Correct Spelling: Anomaly	Concur. Appropriate changes have been made to the text.
4.	iv, Acronyms, DPTMS	Replace with Risk Management (We don't have that directorate)	Concur. The text has been replaced.
5.	iv, Acronyms, EAP	Delete if we don't use it in the document	This acronym is used in Appendix C of the Work Plan.
6.	iv, Acronyms, EMR	Delete if we don't use it in the document	This acronym is used in Appendix C of the Work Plan.
7.	v, Acronyms, NG	Verify that these are good acronyms (Not in Chem Dictionary or internet search)	The acronyms can be found in the documents available at the following websites: http://www.stl-inc.com/analyticalservices/specialty%20services/Energetics%20240703.pdf An EPA document (go to page 3): http://www.epa.gov/swertio1/tsp/download/explosiv.pdf

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
8.	v, Acronyms, NQ	Verify that these are good acronyms (Not in Chem Dictionary or internet search)	See response to Comment No. 7
9.	Vi, Acronyms, STL	Please spell out or ST Lab (May be confused with STLC)	STL is the name of the lab and has not been changed.
10.	4, USAEC	Add the word Army (United States Army Environmental Command)	Concur. The work Army has been added.
11.	5, Table 2-1	Are there 3 AEDB-R sites?	Yes, the AEDB-R numbers will be assigned once the field work is complete and it is determined that they are still eligible for the MMRP.
12.	6, 2.0, para 2	Confusing to use meters & feet in the same paragraph (Are elevations always in meters????)	In the reference material they generally use meters. However, for consistency within this report, measurements have been converted from meters to feet in the referenced section.
13.	10, 2.1.1, 4	Delete, Including Hawthorne Depot in Nevada (Not pertinent)	Concur. Appropriate changes have been made to the text.
14.	10, 2.1.1, 8	add munition-related to waste materials (Global change "munition-related waste materials")	Concur. Appropriate changes have been made to the text.
15.	11, 2.1.1, para 3 line 1	add munition-related to waste materials (Global change "munition-related waste materials")	Concur. Appropriate changes have been made to the text.
16.	11, 2.1.1, para 3 line 2	Delete disposed replace with treated or destroyed (Disposed does not define method)	Concur. Appropriate changes have been made to the text.
17.	12, 2.1.1, 2	August should be September	Concur. Appropriate changes have been made to the text.
18.	12, 2.1.1, para 1 line 3	Add 'under interim status' to my statement (Only emergency detonations have occurred since 01)	Concur. Appropriate changes have been made to the text.
19.	12, 2.1.1, 5	Change are to were	Concur. Appropriate changes have been made to the text.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
20.	12, 2.1.1, para 2, line 1	add munition-related to waste materials (Global change "munition-related waste materials")	Concur. Appropriate changes have been made to the text.
21.	12, 2.1.2.1, 4	Add railroad to siding (Herlong railroad siding)	Concur. Appropriate changes have been made to the text.
22.	12, 2.1.2.2, 2	Are elevations always in meters?	No. In the reference material they generally use meters. However, for consistency within this report, measurements have been converted from meters to feet.
23.	13, 1, first full sentence	Is something missing, it did not make sense to me?	This sentence has been revised.
24.	13, 2.1.2.2, para 2 line 9	add this or the to 'wells in area'	Concur. Appropriate changes have been made to the text.
25.	16, 2.1.3.3, bullets	Delete NC after Nitroglycerin (Incorrect abbreviation)	The abbreviation should have been NG and has been changed. For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used.
26.	17, 2.1.4.3	Not sure RCRA regulated, unclear of location (Not listed in ISD?????)	SWMU #2 is listed as part of the ISD in the RCRA Facility Assessment Report dated 1988. The SWMUs are depicted on a 1985 map titled <i>Master Plan, Basic Information Maps, Figure 2-2. Solid Waste Management Unit Map</i> . The text referenced in this comment was included in the Final HRR. Refer to supporting document Nos. SIAD002315-6 and SIAD002440, provided electronically with the Final HRR.
27.	23, 2.1.4.6, bullets	Delete NC (spelled out on next line)	NC was changed to NG.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
28.	23, 2.1.4.6, bullets	Remove NG and NQ (consistency only)	For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used.
29.	23, 2.1.4.6, bullets	diazodinitrophenol (typo l left off)	Concur. Appropriate changes have been made to the text.
30.	23, 2.1.4.6, bullets	Diphenylamine (typo e left off)	Concur. Appropriate changes have been made to the text.
31.	23, 2.1.5.1	verify operation under ISD	EOD Range, SWMU #5 is listed as part of the ISD in the RCRA Facility Assessment Report dated 1988. The SWMUs are depicted on a 1985 map titled <i>Master Plan, Basic Information Maps, Figure 2-2. Solid Waste Management Unit Map</i> . The text referenced in this comment was included in the Final HRR. Refer to supporting document Nos. SIAD002315-6 and SIAD002440, provided electronically with the Final HRR.
32	24, 2.1.5.1, para 3	Verify EOD Range should never have been used in 04	The letter from DTSC documented the detonation at an unspecified area north of the main installation; however, the attached "Report for Treatment Event" describing the munitions used indicated that the detonation occurred at the "Old EOD Range on SIAD". Refer to supporting document No. SIAD005245-48 provided with the Final HRR.
33.	24, 2.1.5.1, para 3 line 5	What is ADA? Are we referencing the DA?	This should have been DA. The text has been changed to reflect this.
33.	24, 2.1.2.1, para 3 line 4	Correct spelling: Galbreath (twice)	Concur. Appropriate changes have been made to the text.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
34.	25, 2.1.5.2	10,000 pounds refers to the OD ops at DA not EOD (Check references, this is highly unlikely)	This information is from the RCRA Facility Assessment Report dated 1988 which details operations at the SWMU #5 “EOD Explosives Training Area at the Demolition Area” and specifies the 10,000 pound limit. The SWMUs are depicted on a 1985 map titled <i>Master Plan, Basic Information Maps, Figure 2-2. Solid Waste Management Unit Map</i> . The text referenced in this comment was included in the Final HRR. Refer to supporting document Nos. SIAD002315-6 and SIAD002440, provided electronically with the Final HRR. SWMU #5 as indicated on the 1985 figures is in the same location as SWMU #5 in the Work Plan. Refer to supporting document Nos. SIAD002347 and SIAD002315, provided electronically with the Final HRR.
35.	25, 2.1.6.1	I do not believe this is in the ISD (Please verify)	The Buried Trench Area, listed as the “Lower Burning Trenches, SWMU #6” is listed as part of the ISD in the RCRA Facility Assessment Report dated 1988. This text was included in the Final HRR. Refer to supporting document Nos. SIAD002315-6, provided electronically with the Final HRR.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
36.	27, Table 2-6, Conclusions	Were THESE trenches addressed in this document? (Please verify, I do not have this doc)	This is a document titled "Sierra Army Depot, Installation Restoration Program, Proposed Plan for Three Sites at Sierra Army Depot" dated 2004. The information presented in the conclusions of Table 2-6 relating to the Buried Trench Area are from that 2004 document. This text was included in the Final HRR. Refer to supporting document No. SIAD004467, provided electronically with the Final HRR.
37.	28, 2.1.6.3, bullets	Remove NC, NG, NQ. Spell out Nitroguanidine (NC & NQ listed twice)	For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used. Duplicate acronyms have been deleted.
38.	28, 2.1.7.1., heading	Change bldg # to 349	Concur. Appropriate changes have been made to the text.
39.	29, 2.1.7.2., bullets	spell out NC, NG, NQ	For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used.
40.	29, 2.2.1, para 2	check dates, seems wrong (Could not access document to verify)	The dates are from the referenced letter and notice in the Federal Register. Refer to supporting document Nos. SIAD005356-5358 provided electronically with the Final HRR.
41.	30, 2.2.2	Change EOD to SIAD ammunition destroyers (Call if you need clarification)	Concur. The name has been changed as directed.
42.	31, 2.2.3.4	Delete steel and tetracene (used twice)	Concur. Appropriate changes have been made to the text.
43.	33, 2.3.2.3, bullets	Is NA nitrate, sodium nitrate?	Yes. As there was only one reference to NA nitrate, the abbreviation has been removed and the name spelled out in full.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
44.	33, 2.3.2.3, bullets	spell out Nitrocelluose (delete NC)	For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used.
45.	33, 2.3.2.3, bullets	Delete NG (Nitroglycerin is already spelled out)	For consistency, the text has been changed so that the word is only spelled out when first used. After that, only the abbreviations are used.
46.	33, 2.3.2.3, bullets	What is Nitrostarch NQ?	Only NQ should have been listed. This change has been made to the text.
47.	33, 2.3.2.3, bullets	Add DDNP to acronym list	Because this acronym was only used once, it was deleted and the full name was used.
48.	33, 2.3.2.3, bullets	Add EDNA to acronym list	Because this acronym was only used once, it was deleted and the full name was used.
49.	33, 2.3.2.3, bullets	Isn't Ammonium Picrate, Picric Acid and Explosive D	Explosive D is ammonium picrate. They were referenced differently in relation to different munitions items. Explosive D has been deleted from this list to avoid duplication.
50.	37, 4, 1st bullet	We addressed the origin (Our ammo folks can give you this info)	This comment was discussed with Ms. Holliday and it was determined that the text would remain as written.
51.	40, 8	Correct Spelling: Anomaly	Concur. Appropriate changes have been made to the text.
52.	41, para 2, 9	Change DPTMS to Risk Management (RIE)	Concur. Appropriate changes have been made to the text.
53.	41, para 2, 10	Add and the Installation POC	Concur. Appropriate changes have been made to the text.
54.	41, para 4, 6	change of to or	Concur. Appropriate changes have been made to the text.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
55.	41, para 4, 7	small s on ICMs	Concur. Appropriate changes have been made to the text.
56.	42, 9	Change SIAD Env Ofc to Installation POC	Concur. Appropriate changes have been made to the text.
57.	42, 10	Change SIAD Env Ofc to Installation POC	Concur. Appropriate changes have been made to the text.
58.	A-16, para 2 line 7	Do we explain ER11.... Somewhere?	The text as been modified to briefly explain ER1110-1-8153.
59.	A-20, para 1 line 3	Corps not Corp	Concur. Appropriate changes have been made to the text.
60.	Figure A-4	Gravel pit may not be sited properly. (East of Skeedaddle Creek, not west???)	The location of the Gravel Pit was re-checked and determined to be in the proper location. It is located in an area described as a Gravel Pit on topographic maps.
61.	C-1, para 1 line 5	Scheduled for March-April (Last wk of Mar -1st wk Apr) (**If this has changed, when will SIAD be notified)	The date has been changed to July 16, 2007. Ms. Holliday was notified by email.
62.	C-1, para 2 line 7	Remove parentheses after Installation	Concur. Appropriate changes have been made to the text.
63.	C-1, para 5 line 2	What is ER 385-1-92	USACE Engineering Requirement, Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities
64.	C-1, para 5 line 2	What is EM 385-1-1	USACE Safety and Health Requirements
65.	C-2, para 1	Is this paragraph necessary?	Yes, it is a required by OSHA as part of the Work Plan
66.	C-2, Table	Is this Table one?	This table has been numbered.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
67.	C-2, para 3 line 2	What section 10? Section 10 of this APP is PPE????	The text has been changed to indicate that the reader should refer to Section 11 of this APP.
68.	C-2, bullets	Where are these??	These tables are located in Section 11 of the APP as referenced in the sentence above the list.
69.	C-4, 3.3, para 3	Would like to attend some safety meetings	This will be arranged during the site visit.
70.	C-5, table or figure, top right block	What is the H in USAECH for?	Huntsville
71.	C-10, 5.3.2	Please provide copies to SIAD (Our commander asked for them last UXO program)	Copies of the referenced certifications will be provided at the start of field work as specific members of the team will not be determined until that time.
72.	C-18, 7.6.2	WBGT is not available from any SIAD office (TLI can collect WBGT themselves?)	The text has been revised as follows: "...check current weather conditions prior to starting work and periodically throughout the day and interpret the conditions by use of the CAL OSHA Heat Index Chart" http://www.crh.noaa.gov/dvn/tools/heatindex.pdf
73.	C-18, 7.6.2	Spell out WBGT	The reference to WBGT has been deleted. See Response to Comment No. 70.
74.	C-18, 7.6.2	SIAD has very low humidity (may not be necessary?)	See Response to Comment No. 70.
75.	C-19, 8.1	When is installation notified and by whom? (SIAD has reporting requirements also.)	The following text has been added to the referenced Section: "and the SIAD Safety Office and Installation POC".
76.	C-24, 9.8	This is not the correct route/map (Leave from work site, not Herlong)	The map has been changed to provide directions from the site.

Sierra Army Depot Upper Burning Ground, Historical Records Review Report

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
77.	C-29, 11.1,	Add to 1st para move injured personnel to safe, accessible area	The noted text has been added.
78.	C-33, Please add	Mr. Larry Gallegos, SIAD Safety (530) 827-4405	Concur. Appropriate changes have been made to the text.
79.	C-35, 11.4.3	Correct spelling: lightning	Concur. Appropriate changes have been made to the text.
80.	C-52, 12.4, 3	Should read 8 AOC's (Number of MMRP sites is one or three, not eight)	Changed text to indicate that there are three MMRP sites.
81.	C-62, 12.5.1, 4	Change June-July 2006 to March-April 2007 (Have the dates changed? SIAD is planning for March)	The text has been changed to July.
82.	C-62, 12.5.1., 2	Safety office doesn't conduct WBGT (Low humidity?)	The references to the WBGT have been removed and a Heat Index (apparent) Temperature chart has been added. The chart is also available at: http://www.crh.noaa.gov/dvn/tools/heatindex.pdf
83.	C-83, 13.2.1, bullets	What's USAESCH? (multiple times on page)	It refers to the U.S. Army Engineering and Support Center, located in Huntsville, Alabama. It is included in the acronym list for Appendix C.
84.	C-10, 5.3.3	Injured personnel will be moved to safe area for (Injured will be brought to Fire Dept personnel) (Fire Dept Comment: Robie Dennis) medical aid.	The section referenced in this comment is intended to list the training required by on-site personnel. Information regarding procedures to follow in case of emergency is provided in Section 9.4 of Appendix C. No changes were made to Section 5.3.3.
85.	General	High Praise from Safety office on plan (Memo forwarded on request) (Safety Comment: Larry Gallegos) well-written, concise fulfills Army Requirements	No response required.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
86.	General	PW Director was asked if they needed to review (Do not need to review per Director) (PW: Steve Podhurst)	No response required.
87.	C-7, C-74	Brown Recluse should be included (Ammo: Gary Amunson)	Concur. Appropriate changes have been made to the text.
88.	12, 2.1.1, line 3-4	The last funded program ended in Sept. 2001 – several emergency detonations have taken place utilizing EOD since. (Ammo: Kirk Bausman)	Concur. Appropriate changes have been made to the text.
89.	23, 2.1.5.1, last line	remove 'generally' add to 'under' 10,000 (Ammo: Kirk Bausman)	The text as cited matches that of the reference document. Consequently, the text was not changed.
90.	24, 2.1.5.1, para 2 line 3	the detonations (treatment) occurred at the Demolition Grounds - not Old EOD (Ammo: Kirk Bausman)	The text has been changed as follows, “According to an October 7, 2004 treatment report, emergency treatment of ten M117A 750-pound bombs was conducted on September 23, 2004. They were taken from an open storage area in the Main Depot to the “Old EOD Range” at the UBG. All bombs and donor material were consumed by the detonation and no residue was visible. According to Mr. Bausman, this occurred at the Demolition Grounds, not the Old EOD Range.”

Document Review Record			
Reviewed By: USAEC			
Reviewer: Mary Ellen Maly (critical comments in bold type)			
Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
1.	Page 6, Sec 2.1:	Within this discussion on the UBG there were lots of discussions about all the sub-units that are known or suspected to have MEC or MC issues. However, I don't believe there was any discussion on the lands between all these sub-sites. Figure A-2 in the FSP shows that field activities will be conducted outside the known sub-units. Suggest you add a section that deals with all the land not covered in a sub-unit. Personally, I believe the main goal of the field work at this site should be focused on putting boundaries on what part of the UBG is the MR site. We might not be able to whittle it down, but that is important information to know.	The area comprising the balance of the UBG MR Site that was not identified as an AOI has been designated as an AOI in the Final Work Plan and is discussed in subsection 2.1.8 of the report.
2.	Page 6, Sec 2.1, 1 st paragraph, line 7:	I could not find a reference to Figure 2-3 in the text prior to presentation of the figure. Therefore, I suggest you change the figure references on this line to read, "(Figures 2- <u>2</u> and 2- <u>3</u>)".	The reference has been revised to include Figure 2-3.
3a.	Page 38:	UBG Site, MEC SI Purpose column: Please delete the text that says this site is "non-DoD property". The UBG is Army owned land. Please correct.	Concur. The text has been changed to reflect Army ownership.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
3b.	Page 38:	UBG Site & BLM Site, MEC SI Purpose columns: Based on both of these sites' prior history and known MEC finds, is it appropriate to even consider a NFA recommendation based on the SI field work? I don't believe we could get a NFA recommendation approved by the Army or state, even if our field work turned up no MEC finds. Consider revising the text.	The table has been revised to indicate that the information will be used to help delineate smaller areas contained within the UBG and BLM sites that may qualify for NFA.
4.	Appendix A, page A-11, Sec 3.1.6, 2nd paragraph, lines 2-3:	You state that metal sampling results will be compared against site "background levels, if available". If appropriate background metal levels exist, they MUST be added to this plan and presented to all stakeholders prior to the field work. If they do not exist or cannot be used, that needs to be said here in lieu of the current text.	Available background levels have been obtained and included in the Field Sampling Plan.

Document Review Record			
Reviewed By: DTSC			
Reviewer: Lorraine Larsen-Hallock			
Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
General Comments for entire document			
1.		DTSC recognizes that the funding and primary purpose of this work plan is to address the requirements of the Department of Defense (DoD) Military Munitions Response Program (MMRP); however the work plan also serves as the preliminary site investigation of the purpose of Resources Conservation and Recovery Act (RCRA) Corrective Action as a result of potential releases from the previous RCRA Open Burn and Open Detonation treatment units. As such, the purpose and scope of the work plan and applicable subsequent discussions need to include text recognizing the work to be performed must also comply with California Code of Regulations (CCR) and the RCRA specifications for Corrective Action. As written the document limits authority citations to those authorities granted to the Department of Defense via United States Code Title 10. Furthermore, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) require that DoD complies with substantive State and Local laws that are more stringent and the fact that remedial actions have yet to be selected, to exclude CCR as an applicable, or relevant and appropriate requirement at this time	Concur. Text has been added to Section 1.1 of the Work Plan regarding compliance with the CCR and RCRA specifications for Corrective Action at the UBG MR site.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
		would be inappropriate.	
2.		<p>The work plan includes discussions relative to the determination of whether the sites qualify for “no further action (NFA) by DoD. Due to CERCLA and RCRA corrective action, and state Title 22 requirements, the NFA designation must also meet US EPA and California state criteria for NFA.</p> <ul style="list-style-type: none"> i. Since most, if not all, of the UBG may have potential contamination from the previous OB/OD treatment units DTSC concurrence will be required for the designation of areas for NFA ii. The work plan will be useful in the determination of sub-areas which may eventually qualify for NFA, however a Remedial Investigation (RI) would be necessary to confirm a finding of NFA. The designations of these areas would serve the purpose of focusing the RI to activities and analysis which would be necessary to declare the sub-area(s) as meeting the state requirements for reuse purposes. iii. The soil samples proposed for collection are limited to potential releases in the proximity of visually identifiable munitions fragments. Such a sampling program is consistent with the investigation goals stated in the Purpose and Scope and Project Objectives sections of the document. However, such an investigation will not identify or characterize potential contaminants dispersed by wind, surface water, 	<ul style="list-style-type: none"> i. This comment is acknowledged. The results of the SI field work and recommendations for the sites will be discussed at the final TPP meeting and DTSC will have the opportunity to comment on recommendations presented in the Draft SI Report prior to the SI Report being finalized. ii. This comment is acknowledged, no response required. iii. These limitations will be addressed in the SI Report if a determination is made to refer any of the sites or areas for NFA. iv. Based on the sites existing history and the results of previous investigations, in all likelihood this site will move forward to an RI/FS. The scope of the SI is not intended to delineate or illustrate plume deposition. The SI is intended to better delineate the MR sites and determine if the sites should move forward to an RI. If the sites move forward to and RI, complete site characterization will be conducted at that time.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
		<p>sediment, or soil migration at the site. It may also not identify areas where vegetation of rough topography preclude the visual identification of munitions and soil sample collection. Any footprint reduction potential “No Further Action” decisions based on the results of this investigation should therefore be qualified to state these limitations. This may be best addressed by adding a section or subsection to the work plan stating such limitations.</p> <p>iv. The current work plan’s narrow limits of visual inspection and scope of sampling is not sufficient to delineate or illustrate plume deposition due to previous OB/OD treatment activities.</p>	
3.		<p>The plan does not address the disposal or treatment that may be necessary in the event UXO items are discovered during the site inspection field work. The work plan should identify that if discovered UXO is determined to require treatment an emergency treatment permit will be required. In the event an emergency permit is deemed necessary the field activities project manager is required to contact the DTSC RCRA project manager, Lorraine Larsen-Hallock, Northern California Permitting and Corrective Action Branch, or the CERCLA project manager, Francesca D’Onofrio, Office of Military Facilities, for initiation of the emergency permit process.</p>	<p>Under the SI, the field team is precluded from the disposal or treatment of any UXO items. The field team will practice anomaly avoidance and any finds will be reported to USACE and SIAD, as detailed in Section 2.3 of Appendix A. The SIAD staff is responsible for making determinations regarding the ultimate disposal of any UXO items and requesting emergency treatment permits from DTSC. The TLI team will document the location of any UXO items and attempt to determine the specific type of item. Coordinates, photographs, and all other available information will be provided to the SIAD POC.</p>

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
Specific section comments			
1.	Figures 2-1, 2-2, and 2-3	For clarity, Figures 2-1, 2-2, and 2-3 should show the road connecting the main base and the UBG portions of SIAD boundaries. A solid green line connecting the two areas would be sufficient.	A dashed line has been added to the figures to indicate the connecting road.
2.	Table 2-2	<ul style="list-style-type: none"> i. Under the MR Eligibility column for DA and LBA revise the text to read “This site was operated...” since those sites are no longer used for active treatment. ii. The remaining portion of the UBG should be designated an AOI due to potential releases from the previous RCRA treatment units 	<ul style="list-style-type: none"> i. Concur. The text has been changed to reflect that the sites are no longer used for active treatment. ii. The remaining portion of the UBG has been designated as an AOI and is discussed in subsection 2.1.8 of the Final Work Plan.
Appendix A Field Sampling Plan (FSP) comments			
1.	Section 1.1	Text describes the Visual Survey Team consisting of “...an Environmental Professional and an Unexploded Ordnance (UXO) Technician III.” From the description noted and later text within the FSP, it appears non-UXO qualified individuals will be traversing the site for purposes of performing the visual survey and determining whether MEC or evidence of MEC is present. If this is the case, DTSC has serious concerns regarding the use of non-UXO qualified individuals who would be responsible for identifying MEC or evidence of MEC. These concerns are not only made from a safety stand point but from the point of view regarding experience and capabilities to properly recognize MEC or evidence of MEC.	The USACE allows all essential personnel down-range on all USACE projects. All personnel participating in this field effort are considered essential. Although not all personnel are EOD trained, all have undergone ordnance identification training and have participated in field efforts for numerous ordnance projects (for all branches of the military). Additionally, two EOD qualified individuals are assigned to the field team and will provide positive identification of all possible MEC items. Finally, the Work Plan calls for MEC avoidance measures to be exercised at all time and no member of the field crew are to come in direct contact with MEC items.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
2.	Section 1.1.1	The laboratories used for implementation of this work plan must also be California Certified for the necessary methods and procedures.	The text has been modified to state that the analytical laboratory will also be California Certified.
3.	Section 3.1.2	“...Section 9.0...” should read “Section 11.0	Concur. Appropriate changes have been made to the text.
4.	Table 3-2	<p>The Draft SI Workplan does not propose to analyze soil samples for either perchlorate or tungsten. There is a significant potential for perchlorate to have been released to soil, based on the types of munitions listed in Section 2.1.4.6 of the work plan (Summary of MEC and MC). Tungsten is less likely to have been used in munitions at SIAD, but this possibility should be evaluated based on data from the investigation. Although it was discussed and decided during the TPP meeting not to include Tungsten, DTSC’s experience on other projects has indicated the potential for DoD historical records to be lacking accuracy relative to the types of munitions handled or treated at a site. In order to address this uncertainty DTSC recommends the following: (a) A subset of soil samples (15-25%) should be analyzed for perchlorate using EPA Method 8321. If possible, this subset should be collected from near munitions types identified as having a high potential for containing perchlorate. (b) A subset of soil samples (15-25%) should be analyzed for tungsten, using EPA Method 6010). Appropriate action levels for those constituents should be added to Appendix A, Table 3-2 (Project Analyte list and Action Level Concentration), and the Quality</p>	<p>Because it is unlikely that these sites will be recommended for NFA, the SI samples will not be analyzed for tungsten or perchlorate at this time. Additionally, since there is no historic evidence to support the existence of munitions containing tungsten at Sierra, it does not seem prudent to add this analyte to the list.</p> <p>The issue of sample analysis for tungsten and perchlorate will be reevaluated during the RI/FS.</p>

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
		Control/Quality Assurance (QA/QC) criteria of these analytes should be added to Appendix A, Table 3-3 (Quality Control Criteria for Soil Samples).	
5.	Section 3.1.3, Second Paragraph:	“Development of DQOs is an iterative process led by the TLI Solutions PM and will be updated in response to stakeholders.” This is true, but should be removed from the FSP as once it is approved the process is not longer iterative. Changes to the DQOs as they pertain to the FSP must be reviewed and agreed upon by DTSC.	Concur. This statement was removed.
6.	Section 3.1.4, First Paragraph	The sentence “within these areas, if a munitions disposal area can be identified, ...” seems too restrictive and should read “Within these areas, if a munitions disposal or contamination area can be identified, ...” in order to address kick-out or deposition potential as well.	Concur. Appropriate changes have been made to the text.
7.	Section 3.1.5	The decision statement is too broad because the work plan is not looking at all potential contamination (sub-soil, groundwater, etc.). DTSC suggests something like, “Have past military munitions activities resulted in evidence of metals or explosives contamination in shallow soils that indicates further study is warranted?”	Concur. Appropriate changes have been made to the text.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
8.	Section 3.2.1.2	<p>The FSP indicates a limited number of samples will be taken however with the large area to be covered it is unclear how the field activities will progress to ensure the sampling is spread throughout the UBG. What will be the maximum number of samples the field team will be able to take? Will potential sampling points be first flagged based on the identified criteria and if these points exceed the sampling capabilities how would the identified points be ranked for sampling? For efficiency during field activities it would seem the field team would collect samples with the first pass of inspection. In this case how would the team ensure adequate coverage of the UBG while not exceeding the maximum sampling capability? Perhaps reserving some number of samples (e.g. 10%) until after the traverses are complete, the field team could go back and pick up the highest-ranked sites that had not been sampled. If a ranking system is to be utilized the FSP needs to identify the ranking criteria.</p>	<p>The number of samples listed in Table 3.4 is the maximum number of soil samples that will be collected at the UBG. The SI process is only trying to determine the presence of MC over a specific action level and is not intended to characterize the entire site.</p> <p>If it is determined during the field work that additional samples should be collected based on field conditions, Young Chong has the ability to execute options to the contract that would allow for the addition samples to be collected.</p> <p>Typically, the field team will dictate the visual surveys and identify potential sampling locations as this work is performed. However, due to the remote nature of portions of these sites, samples will be collected in these areas as the surveys are conducted. As always, we will utilize biased sampling where possible. On the more accessible areas, the team will evaluate the majority of the site prior to collecting samples. However, if areas are identified as being heavily impacted by munitions, these areas will be sampled as they are observed.</p>

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
9.	Section 3.3.2	Because DTSC field oversight is impractical due to munitions hazards, a thorough and detailed photo documentation of soil sample collection is recommended. This section indicates that photographs will be taken during the field investigation, but does not elaborate on the scope of documentation. DTSC recommends additional detail in this section, specifically whether photographs will be taken at each location sampled.	Section 3.2.1.2 states that a photograph will be taken of each sample location. The field team is very diligent with regard to documenting all portions of the field activity. Photographs delineating the area of the site being sampled and the specific sample location will be included in the SI Report.
10.	Section 4.0	California Business and Professions Code, Chapter 12.5, Article 7835 requires reports which included the interpretation of geophysical data must be signed and stamped by a California licensed geophysicist. Text should be added stating that any geophysical reporting will be under the signature of a California licensed geophysicist.	Section was 4.1.7 of the Field Sampling Plan was modified to incorporate the comment.

Document Review Record			
Reviewed By: USACE, Sacramento District			
Reviewer: Tommy L. Waldrup			
Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
1.	General	The Sampling and Analysis section of this Site Inspection Work Plan is acceptable with no major comments.	No response required.
1.	Page A-15, Section 3.2 Field Activities, Line 28	Suggestion: The Project Chemist should be responsible for handling the EnSys Soil Test kit. This document does not state how much chemistry experience the On-Site Manager has.	Text has been modified to state that the Project Chemist will be utilized if needed to ensure proper reading from EnSys Soil Test Kit.
2.	Page A-18, Section 3.2.1.2 Sample Collection	Suggestion: Procedures 7 & 8 should be rewritten so that it reflects that once the sample is collected and the lid closed, the sample should be labeled prior to placement in the cooler. Please see process sequence in 3.2.2.2. (Sequence consistency)	Procedures have been edited to incorporate the sampling steps called out in this comment.

Document Review Record			
Reviewed By: USACE, Sacramento District			
Reviewer: Thomas Knapp			
Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
1.	pg 5 through 34	General Comment. Very good historical background information. MEC hazards were presented very well throughout these pages-Good!	No response required.
2.	Pg 36, 3.0, 2 nd bullet, 2 nd sentence	The sentence suggests there will be times when anomaly avoidance/UXO escort processes will not be utilized. Specifically it states avoidance will only be utilized if MEC is located (this is incorrect). Per the APP (Appendix C, para 11.8.2 & 3) anomaly avoidance/UXO escort processes will occur anytime a site is entered. Please change the 2 nd bullet to reflect this thought process.	Anomaly avoidance/UXO escorts will be utilized at all times that entry is made into the sites. The noted text has been modified accordingly.
3.	Pg 41, 4 th paragraph	Please keep the CESPCK-PM/CEPK-SO informed of ICM waiver/risk assessment progress. Also, the paragraph states "Additional protocol regarding ICMS is addressed in the APP". I couldn't locate any additional information-please provide a paragraph # for location of this additional data.	It has been determined by the Department of the Army that ICM waivers will not be required for the SI.
4.	App B, pg 3, 4 th paragraph	I noted no discussion, within the WP, of these ten-"destroyers". Has a decision been reached that would allow them to accompany the SI Team?	This has not yet been determined. If they do accompany the SI Team, they would do so as employees of SIAD and would be required to follow both, the safety requirements of the APP and the safety requirements they follow in their current positions at SIAD.

Comment Number	Section, Paragraph, Page	Reviewer Comment	Preparer Response
5	App C, Pg C-17, para 7.5.3	Please define what “worked continuously” means, with regards to medical exit exams.	Text has been added to indicate that this means working an 8 hour shift or 40 hour week in an area with suspected contamination.
6.	Appendix C, pg C-19, paras 8.2.2	I noted the addition of the CESP-K-SO to the notification reporting process and the addition of the phone number at Table 1-GOOD! These additions were in response to comments I previously made relative to another SI Work Plan. Thanks for following through!!	TLI always attempts to ensure that comments received on earlier deliverables are incorporated into subsequent documents. No additional response required.
7.	Appendix C, pg C-43, para 11.8.3, 3 rd sub-par, last sentence	This sentence could be misinterpreted to allow “clearance” of anomalies. I believe you mean the UXO Tech will check the sampling site with the magnetometer and if no anomalies are present will then allow the sampling to take place. If an anomaly is present the sampling will not be allowed. Please reword the sentence to clarify the avoidance/sampling process.	The following text has been added for clarification: “Soil sampling procedures will be conducted after the sample site has been determined to be clear of anomalies. Soil samples will not be collected until a UXO Technician has checked the sampling site with a magnetometer. Once the intended soil sample site has been determined to be clear of anomalies, the sample will be collected.”