



DEPARTMENT OF THE NAVY

CRANE DIVISION  
NAVAL SURFACE WARFARE CENTER  
300 HIGHWAY 361  
CRANE, INDIANA 47522-5000

IN REPLY REFER TO:

5090  
Ser 095/9080  
05 APR 1999

U.S. Environmental Protection Agency, Region V  
Waste, Pesticides, & Toxics Division  
Waste Management Branch  
Illinois, Indiana, and Michigan Section  
Attn: Ms. Carol Witt-Smith (DW-8J)  
77 West Jackson Blvd.  
Chicago, IL 60604

Dear Ms. Witt-Smith:

Crane Division, Naval Surface Warfare Center (NAVSURFWARCENDIV Crane) submits, as enclosure (1), three copies of the TolTest Mine Fill A (SWMU 12/14) and Mine Fill B (SWMU 13/14) Site Specific Safety and Health Plan (SSHP) - Appendix A2 for incorporation into the Final Full Scale (FS) Operational Plan (OP) for the Bioremediation Project. TolTest Inc. will forward to your office an electronic copy of the SSHP. A replacement page for page v of the FS OP Table of Contents is included as enclosure (2). Enclosure (3) is the required certification statement.

NAVSURFWARCENDIV Crane point of contact is  
Ms. Christine D. Freeman, Code 09511, telephone 812-854-4423.

Sincerely,

A handwritten signature in cursive script that reads "James M. Hunsicker".

**JAMES M. HUNSICKER**  
Director, Environmental Protection Department  
By direction of  
the Commander

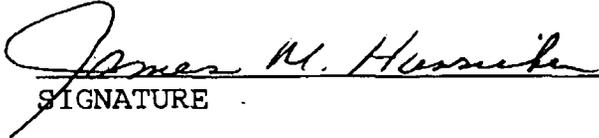
Encl:

- (1) Appendix A2 - SWMUs 12/14 & 13/14 SSHP
- (2) Replacement page for FS OP Table of Contents page v
- (3) Certification Statement

Copy to:

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NAVSURFWARCENDIV ROICC (w/o encls)  
SOUTHNAVFACENGCOM (Code 1864) (w/o encls)  
TOLTEST Crane (w/o encls)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
SIGNATURE

DIRECTOR, ENVIRONMENTAL PROTECTION DEPT.  
TITLE

9/5/99  
DATE

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## 1.0 Introduction

This Task-Specific Site Safety and Health Plan (SSHP) describes safety and health requirements for interim cleanup measures at NSWC Crane, specifically for full-scale operations conducted at Solid Waste Management Unit (SWMU)-12/14, Mine Fill A, and SWMU 13/14 ,Mine Fill B, and the Soils Bioremediation Facility. This SSHP is consistent with requirements of the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Site Regulations; 29 CFR 1910.120 and 29 CFR 1926.65; and the U.S. Army Corps of Engineers (USACE) *Safety and Health Requirements Manual* EM 385-1-1 and ER 385-1-92. This SSHP is applicable to all personnel who enter work areas described in this SSHP and who are under the control of TolTest, Inc. (TolTest) or TolTest's Subcontractors.

### 1.1 Work Task Summary

**SWMU-12/14, Mine Fill A** - Excavation, removal, and screening (includes rock washing) of originally approximately 2,400 cubic yards of explosives-residual contaminated soil, transport to the Bioremediation Facility, soil sampling, decontamination, and site restoration. Table A-1 provides a summary on site description and contaminants.

**SWMU-13/14, Mine Fill B** - Excavation, removal, and screening (includes rock washing) of originally approximately 22,000 cubic yards of explosives-residual contaminated soil, transport to the Bioremediation Facility, soil sampling, decontamination, and site restoration. Table A-1 provides a summary on site description and contaminants.

**Bioremediation Facility** - Explosives contaminated soil will be received at this facility from SWMU-12/14 and SWMU 13/14. The contaminated soil will be processed by mixing with amendments and composting in covered structures. Support subsystems include decontamination facilities; storm water diversion and retention controls; and office and laboratory trailers. Amendments that will be mixed with the contaminated soils include straw and chicken manure. Amendments will be loaded into a grinder/mixer and discharged into the composting building for formation of the windrows (refer to the Full Scale Operational Plan).

## 1.2 Contaminant Characteristics

The potential contaminants are summarized below. Material Safety Data Sheets (MSDSs) or National Institute for Occupational Safety and Health (NIOSH) Pocket Guides will be used as a source of information for each contaminant. MSDS and NIOSH information for each of the potential contaminants, process chemicals, or other chemical substances encountered during the interim cleanup process will be organized into a separate binder, commonly called the "MSDS Binder." These binders will be available to all personnel, at anytime, and will be at appropriate on-site locations including the ToITest job-site trailer. Additional information concerning potential contaminants is presented in Table A-2. The potential contaminants contained in the soils to be received at the Soils Bioremediation Facility are summarized below.

**SWMU-12/14, Mine Fill A** - Soil containing residues of TNT, HMX and RDX, and explosive-contaminated wastewater are present at the excavation site. Concentrations of individual constituents in the soil ranged from undetected to 15,300 mg/kg (Halliburton NUS, 1992). Halliburton NUS 1992 also reports other chemicals of concern to include, bituminous asphalt, micro-crystalline wax, toluene, naphtha, coal-tar naphtha, methylethylketone, and aluminum. In the same report, they report hazardous waste potentially generated at Mine Fill A to include sludge containing explosives, pink water (TNT containing), grit blast residue (cadmium, chromium, lead, barium), paint waste (metals and hydrocarbons to include halogenated, aromatic, ketone and alcohol), and spent carbon. Follow-up soil sampling and subsequent analysis for soils representing the initial 2,400 cubic yards to be composted confirmed HMX, TNT, and RDX contamination. Total metals reported include barium, cadmium, chromium and lead in low microgram/kilogram (mg/kg) concentrations. TCLP metals were undetected in the majority of the sampling runs. Volatile organics were undetected or estimated to be in the low mg/kg concentrations.

**SWMU-13/14, Mine Fill B** - Soil containing residues of TNT, HMX and RDX, and explosive-contaminated wastewater are present at the excavation site. Concentrations of individual constituents in the soil ranged from undetected to 24,000 mg/kg (Halliburton NUS, 1992). The boiler systems in Buildings 166 and 171, which used PCB oils, released PCBs into nearby soils. The boilers and known PCB-contaminated

soil were removed from the area in 1989. Subsequent confirmation sampling, however, revealed that soils with PCB concentrations greater than 10 mg/kg still remain. Halliburton NUS 1992 also reports other chemicals of concern to include, bituminous asphalt, micro-crystalline wax, toluene, naphtha, coal-tar naphtha, methylethylketone, and aluminum. In the same report, they report hazardous waste potentially generated at Mine Fill B to include sludge containing explosives, pink water (TNT containing), grit blast residue (cadmium, chromium, lead, barium), paint waste (metals and hydrocarbons to include halogenated, aromatic, ketone and alcohol), and spent carbon. Follow-up soil sampling and subsequent analysis for soils representing the initial 22,000 cubic yards to be composted confirmed HMX, TNT, and RDX contamination. Total metals reported include barium, cadmium, chromium and lead in low microgram/kilogram (mg/kg) concentrations. TCLP metals were undetected in the majority of the sampling runs. Volatile organics were undetected or estimated to be in the low mg/kg concentrations.

### 1.3 References

- American Conference of Governmental Industrial Hygienists (ACGIH), 1996-1997. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices.*
- Beall, 1997. Explosives Hazard Analysis Report: Recommendations. Morrison Knudsen Corporation, NSWC Crane, Indiana. 4324-563, July 17.
- Comarco, 1997. Final Explosives Hazard Analysis Report for Soils Bioremediation Process Equipment, NSWC Crane, Indiana. July 7.
- Halliburton NUS, 1992. *Final RCRA Facility Investigation Phase I EMR SWMU 19/00, 08/17/12/14, and 13/14, NSWC Crane, Indiana.* August.
- ToITest, 1999. *Safety Operating Procedures and Guidelines Manual.* January
- ToITest, 1997. *Corporate Safety and Health Program.* Rev. 1. August.

ToITest, 1995d. NAVFAC SouthDiv Project Procedures:

*PHSP 01.1, Hazardous Energy Control (Lockout/Tagout), 3/15/96.*

*PHSP 02.1, Emergency Response, 3/15/96.*

*PHSP 03.1, Spill Response, 3/15/96.*

*PHSP 04.1, Incident Reporting, 3/15/96.*

*PHSP 05.1, Excavations, 5/21/96.*

MK, 1994e. *White Paper on Composting Technology*. December.

MK, 1998. *Full Scale Operational Plan for Soils Bioremediation Facility*. Revision 0. February.

NIOSH/OSHA/USCG/EPA, 1985. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*. DHHS (NIOSH) Publication No. 85-115. October.

NIOSH, 1994. *Pocket Guide to Chemical Hazards*.

Naval Energy and Environmental Support Activity (NEESA), 1983. *Initial Assessment Study of NSWC, Indiana; NEESA 13-0003*, NSWC Crane, Indiana. May.

OSHA, 1997. *Limits for Air Contaminants*, Title 29 CFR Part 1910 Section 1000, Table Z-1, July 1.

U.S. Army Corps of Engineers (USACE), 1992. *RFI Phase II Soils Report for Rockeye, SWMU 10/15, NSWC Crane, Indiana*. IN5 170 023 498. July.

## 2.0 Safety and Health Hazards/Risk Analysis

### 2.1 Overview

Hazards at this site include construction safety hazards associated with heavy equipment operation; soil excavation, potential contact with underground utilities and undermining of structural supports in Mine Fill A and B; inclined walking and working surfaces; traffic control including haul road layout; energy control (electrical and other kinetic energy sources) or other utility lines; site restoration including backfilling and compaction; and physical hazards.

During full-scale operations, the potential risk of acute exposure to the chemical contaminants listed in Table A-2 is considered low if the engineering controls, administrative controls, and personal protective equipment (PPE) requirements are strictly adhered to. The highest health risk chemical contaminant is Ammonia (NH<sub>3</sub>) generated from chicken manure. Potential health hazards involving hydrocarbons, *other* inorganics, and other gases and vapors are also considered low. Potential biological hazards may include airborne bioaerosols such as bacteria and fungi (molds and yeast). The health hazard potential is considered moderate based on published results of air sampling campaigns at sewage sludge, leaf, and municipal waste composting facilities. The processing equipment at the Soils Bioremediation Facility has been designed and will be operated to minimize dust releases, and safeguarded to prevent employee contact with rotating equipment. A Chemical Hygiene Plan (CHP) has been prepared to establish safe laboratory practices and procedures, refer to Attachment A of this document.

### 2.2 Activity Hazard Analyses

Activity Hazard Analysis (AHA) for each anticipated task have been prepared in accordance with EM 385-1-1, September 1996 (USACE, 1996). These hazard analyses are in the form of worksheets contained in Attachment B of this SSHP. Prior to starting work each site activity shall be reviewed by field supervision. The ToITest Site Safety and Health Officer (SSHO) and ToITest Project Superintendent (PS) shall determine if the prepared AHA adequately addresses the planned activity. If the

prepared AHA requires revision or a new task is identified, additional hazard analysis will be prepared as needed. A new AHA worksheet shall be field prepared by the TolTest SSHO before the activity takes place. The PS will conduct Pre-Entry Briefing meeting to review the AHAs with all affected workers.

### **2.3 Chemical Hazards**

The potential chemical contaminants, their exposure limits, sign and symptoms of overexposure, and first aid requirements are presented in Table A-2.

### **2.4 Biological Hazards**

Each work area will be approached with caution and assessed for insect, snake and biohazard plant life. Potential biological bioaerosol hazards include bacteria, molds, yeast and fungi which may be present in airborne concentrations greater than background during the composting process at the Bioremediation Facilities.

### **2.5 Construction Safety Hazards**

**2.5.1 Physical Hazards** - Physical hazards on this project include the use of heavy equipment including haul trucks, backhoe and loader, screener, grinder, windrow turner and other process equipments. Other physical hazards include slips, trips, falls, noise and adverse weather stress. Project personnel will receive site-specific safety training, to orient themselves to these potential hazards.

**2.5.2 Noise** - Equipment operations may generate noise levels that exceed allowable limits. Hearing protection is required when noise levels exceed 85 decibels, a weighted network {dB(A)} steady state or 140 dB(A) impulse, regardless of the duration of exposure. Hearing protection will be provided to all field personnel. A comprehensive Hearing Conservation Program will be implemented when noise levels equal or exceed 85 dBA on an 8-hour time weighted average. Exposure assessments will be conducted by the TolTest SSHO throughout the project.

**2.5.3 Heat and Cold Stress** - All associates are to be aware of the signs and symptoms of heat and cold stress. Signs and symptoms of heat stress include extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, rapid pulse, or pale clammy skin occur. When heat stress is suspected the associate is to immediately

leave the work area, rest, cool off, and drink plenty of cool water. If the symptoms do not subside after a reasonable rest period, the associates shall notify the supervisor, who in turn will notify the ToITest SSHO and seek medical assistance. The ToITest SSHO and the Project Superintendent (PS) will be alert to signs of heat stress in site personnel and increase the frequency of breaks and fluid consumption as necessary.

In judging the cold hazard, both air temperature and wind chill factor must be considered. To prevent cold stress, proper clothing must be worn. It is important to preserve the air space between the body and the outer layer of clothing to retain body heat. Cold stress injury is classified as either generalized, as hypothermia or localized, as in frostbite, frost nip, or chilblain.

The first symptoms of hypothermia are uncontrolled shivering, the sensation of being cold; the heartbeat slows and sometimes becomes irregular; the pulse weakens and blood pressure changes. Severe shaking or rigid muscles caused by bursts of energy change the body chemistry. Vague or slowed speech occurs; memory lapses, incoherence and drowsiness then occur. As core temperature continues to drop, listlessness, confusion and little attempt to keep warm commences. Pain in the extremities is felt. As exhaustion sets in, the body's ability to contract blood vessels is diminished, and rapid loss of heat and cooling begins.

Frostbite can occur without hypothermia when the extremities do not receive sufficient heat from central body stores. This can occur because of inadequate circulation and/or insulation. This condition results in damage to and loss of tissue. The most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes. Damage from frostbite can affect the outer layer of skin only, or it can include the tissue beneath the outer layer. Damage from frostbite can be serious; scarring, tissue death and amputation are all possibilities. The symptoms of frostbite include: 1) The skin changes color to white or grayish-yellow, progresses to reddish-violet and turns black as tissue dies; 2) Pain may be felt at first, but subsides; 3) Blisters may appear; 4) The affected part is cold and numb; and 5) The skin has a waxy appearance.

Refer to Section 7.2.6 for more guidance on heat and cold stress management.

**2.5.4 Excavations** - Open excavations and trenches present a potential hazard of physical injury by falling into the excavation and/or side wall collapse near or inside the excavation. To minimize the risk of injury, the excavation work site will be barricaded. The deepest excavation on this project may be slightly more than 3 feet. OSHA 1926.650 Subpart P - Excavations and USACE EM 385-1-1, Section 25, requirements for sloping or shoring are not anticipated to be utilized on this project due to the depths of the excavations and the competency of the soil. When excavations are completed near building sidewalls and foundations, a competent person knowledgeable about excavation work will assess potential collapse scenarios and specify any control requirements (e.g. shoring).

Positive identification of underground utilities and services is required at least 24 hours prior to any excavation, trenching or penetrations. An Excavation and Trenching Permit application must be submitted at least seven days prior to any excavation activities. The TolTest Project Manager (PM) will be responsible for obtaining this permit through the NSWC Crane Public Works Department (PWD). Part of this permit process will include a UXO survey by the NSWC representative. TolTest will have a designated competent person who will evaluate all excavations and trenches on a daily basis. Inspections shall be recorded in a log book or field inspection checklists.

**2.5.5 Hazardous Energy Control (Lockout/Tagout)** - Ground Fault Circuit Interrupters (GFCIs) will be installed on all temporary portable electrical equipment in accordance with EM 385-1-1 Section 11.C.05. All extension cords shall have GFCI protection and shall be inspected and determined to be free of cracks or frays.

Any system where the potential exists for unexpected energizing, start-up, or release of kinetic or stored energy during servicing and maintenance resulting in injury or damage shall be energy isolated in accordance with EM 385-1-1 Section 12, and 29 CFR 1910.147. The TolTest PS shall be responsible for verifying adequacy of all lockout/tagout installations and notifying all affected personnel. The TolTest Project Superintendent has the responsibility for implementing energy control measures. The PWD will provide energy control services on Mine Fill A and B utilities and process equipment if necessary. TolTest will provide their own energy control services on the Bioremediation Facility equipment and processes.

Energy controls also apply to motorized heavy equipment and process equipment. The following requirement shall be applied. At a minimum, during service and maintenance of motorized equipment, the key shall be removed and in possession of the service or maintenance person and a "Do Not Operate" tag signed by this person shall be displayed near the start-up controls. Pre-operational checks and maintenance requirements on process equipment, including energy control will be incorporated into checklists.

**2.5.6 Fire and Explosion** - No hot work or open flames will be allowed in the work area without a Hot Work Permit obtained through the NSWC Fire Services. Hot work permitting will be coordinated through the base Fire Department. Flammable and combustible fuels for heavy equipment shall be stored and dispensed in accordance with NFPA 30, the Flammable and Combustible Liquids Code.

Fire extinguishers will be located at the diesel fuel storage location and in each of the composting buildings. All mobile heavy equipment must be fitted with a minimum 5 lb "ABC" fire extinguisher. Any temporary trailers or structures must have fire extinguishers installed in accordance with NFPA 10. Depending on the fire loading, in most cases a 5 lb "ABC" is sufficient in each office trailer. This extinguisher must be mounted approximately four feet from the floor next to an egress door. The TolTest SSHO is responsible for performing monthly inspections on the fire extinguishers and recording the inspections appropriately. Use of any tool that can be considered an ignition hazard is strictly prohibited where fire and explosion hazards may exist. Smoking is permitted only in designated areas, this applies to excavation sites and the Bioremediation Facility.

To reduce the risk of explosion, NSWC personnel will conduct an unexploded ordnance (UXO) survey prior to site mobilization. The UXO survey may continue throughout the excavation process. Explosives Hazard Analysis was completed for process equipment by Comarco (1997). Implementation of the recommendations by Comarco (1997) were summarized in a memo by Beall (1997). Controls include the following:

1. Employee awareness training on the potential for burning and explosion.

2. Monitor Screener output for lumps greater than 1.5 inches in diameter and insure these lumps are not transported to the Bioremediation Facility for composting.
3. Monitoring for dust and use of water sprays to minimize dust generation.
4. Establish decontamination procedures for all equipment.
5. Only rubber-tired equipment is permitted in areas where explosive contamination is present.
6. Use only non-sparking bristles on the power brush.
7. Conduct personal training on the safe use on the laboratory bench oven installation.

**2.5.7 General Motor Vehicle, Hand and Power Equipment Safety** - The following traffic rules will apply to all motorized vehicles and equipment while on site:

1. Equipment carrying waste shall always have the right-of-way within the Work Zones.
2. The speed limit is 10 mph, or as posted. Exceeding the speed limit is cause for disciplinary action, including removal from the site.
3. Personnel shall not ride equipment that has not been specifically designed for the transport of personnel.
4. Seatbelts shall be worn at all times when operating any motorized equipment or vehicle.
5. All motor vehicles and equipment including hand and power tools shall be subject to safety inspections by the ToITest SSHO. The ToITest SSHO

reserves the right to reject any equipment. A "DO NOT USE" or "DEFECTIVE" tag will be placed on the equipment and documented in the TolTest SSHO logbook. Corrective action will be pursued with the PS.

6. Daily safety checklists shall be completed by heavy equipment operators and delivered to the TolTest Site Project Office on a daily basis. The checklist is based on the equipment manufacturers recommended guidelines for daily checks.

**2.5.8 Vehicular Traffic and Work-Site Control Hazards** - Potential hazards from vehicular traffic around work areas including the Soils Bioremediation Facility will be controlled by using traffic control items such as traffic cones, flagging, barricades, and signs. Types and placement of traffic control items will be in accordance with EM 385-1-1, Section 8 and 29 CFR 1926.201 and 202. Workers required to work in active traffic paths or roadways will be required to wear high visibility reflective vests.

**2.5.9 Access and Haul Roads** - If special access and haul roads are required and constructed for this project, they will be constructed in accordance with EM 385-1-1 Section 21.1.

### **3.0 Staff Organization, Qualifications and Responsibilities**

This section describes the roles and responsibilities of project personnel with regard to safety and health. Ultimately, responsibility for the safety and health lies with the individual. All personnel must be cognizant of the hazards and the methods of reducing the risk of injury and illness. All personnel will comply with the rules and procedures set forth in this plan and will make project management aware of any conditions which may jeopardize the welfare of project workers and/or the general public. The specific personnel names and telephone numbers of responsible persons are presented in Table A-3. Figure A-1 is the route map to the nearest medical facilities which also shows the NSWC Base layout.

#### **3.1 TolTest Project Manager**

The TolTest Project Manager (PM), Mr. Lance Parsons, is responsible for the management of all aspects of the project, including safety and health. The PM is responsible for ensuring that all project tasks receive appropriate safety and health review before commencement of field activities and that the necessary equipment and facilities are available to implement the SSHP.

#### **3.2 TolTest Project Superintendent**

The TolTest Project Superintendent (PS), Mr. Denny Waggoner, is responsible for ensuring that the safety and health aspects for the particular task are addressed. He is responsible for the implementation of the SSHP in the field and for ensuring that all project personnel comply with provisions of the plan. The PS is also responsible for notifying the SSHO of any changes in work conditions which may affect the safety and health aspects of the task. The PS is responsible for conducting Plan of the Day (POD) meetings and Pre-Entry Briefings when required.

The PS must notify the SSHO of all accidents and incidents as soon as possible. The PS shall conduct an accident investigation and record the results of the investigation on a Accident Investigation Report form or equivalent form. The initial investigation report shall be formally transmitted to the PM and Corporate Health and Safety Manager within one hour after critical management of the incident is complete. The

PM shall follow the reporting requirements described in PHSP 04.1. The PS shall conduct a critique of the incident with selected TolTest and Subcontractor personnel as soon as possible after critical management of the incident is complete. The PS and SSHO will develop lessons learned and communicate them to all affected personnel.

### **3.3 TolTest Site Safety and Health Officer**

The TolTest SSHO, Mr. Travis Nowak, is responsible for the day-to-day implementation of the SSHP, and verification of compliance with the SSHP and all applicable occupational safety and health rules and regulations. The SSHO has the authority to suspend work at any time if there is an imminent threat to the health and safety of project workers or the general public. The SSHO shall assure the Navy's designated authority at the site is notified immediately of any accident including spills. The SSHO shall assist in the accident investigation effort and shall have final approval authority for accident reports. The TolTest Work Plan document describes in detail the role and responsibilities of the SSHO on this project. The SSHO in conjunction with the Corporate Health and Safety Manager are responsible for making modifications to the plans and recommending changes to the work tasks if they affect safety and health. The SSHO is responsible for ensuring that all required sampling/monitoring is performed and that all required safety and health documentation is maintained.

### **3.4 Nearest Emergency Medical Facility**

#### **Directions to the On-Site NSWC Medical Department:**

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of road H-2, just north of H-5. See Figure A-1.

#### **Directions to Bedford Medical Center:**

From the Bloomington Gate, head east on Highway 58 to the city of Bedford, turn left onto 16th. This Gate is open 24 hours. The approximate distance to hospital is 22 miles.

From the Bedford Gate, head east on Highway 158 to the city of Bedford, 158 turns left onto 16th Street. The distance to hospital is approximately 22 miles. This gate is open during the hours of 6 AM to 8 AM and 3 PM to 6 PM on Mondays through Fridays exclusive of holidays.

**Directions to Bloomington Hospital:**

Exit NSWC on road H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street; the hospital will be on right-hand side of the road.

## 4.0 Training Requirements

This section summarizes training requirements for project personnel. A summary of training requirements is provided as Table A-4.

### 4.1 Hazardous Waste Operations Training

All personnel entering a contamination reduction zone or exclusion zone shall have completed the initial 40-Hour Hazardous Waste Operations Safety and Health Training and three days of supervised experience pursuant to 29 CFR 1910.120(e)(3). All personnel shall receive eight hours of refresher training annually, pursuant to 29 CFR 1910.120(e)(8), as necessary. All on-site supervisors and managers shall receive an additional eight hours of specialized training pursuant to 29 CFR 1910.120(e)(4).

### 4.2 Site Specific Training

All personnel shall receive site-specific safety and health training prior to entering the site or commencement of work. All site associates and subcontractors entering the contamination reduction zone (CRZ) and the Exclusion Zone (EZ) shall receive this training. The PS is responsible for identifying personnel requiring this training and coordinated with the ToITest SSHO regarding scheduling of this training. The ToITest SSHO or designated alternate will conduct the training. Site visitors shall receive site-specific training prior to entering these areas. The format and content will be left up to the discretion of the SSHO. The training will cover the SSHP, but not necessarily be limited to the following topics:

- names of site safety and health personnel;
- safety and health hazards present on the site and anticipated during the project work;
- hazard communication;
- PPE requirements;
- safe work practices;
- engineering controls;
- medical surveillance requirements, including recognition or symptoms and signs which might indicate overexposure to hazards;
- decontamination procedures;

- emergency procedures;
- spill containment plan;
- energy control; and
- all other requirements of this SSHP.

#### 4.3 Respiratory Protection Training

All personnel required to use respiratory protection shall have certified training in respirator use, care and maintenance pursuant to 29 CFR 1910.139. Each individual shall be medically qualified to wear a respiratory device and have documented evidence of completing respiratory training and fit testing. Personnel required to use disposable dust masks shall be trained only on the use and limitations of these units.

#### 4.4 Hazard Communication Training

All personnel shall complete hazard communication training pursuant to 29 CFR 1910.1200 and 29 CFR 1926.59 regarding all potentially hazardous chemicals to which they may be exposed. MSDSs and/or NIOSH Pocket Guides for the contaminants suspected to be in the various work sites will be placed in a site "MSDS Binder". Hazard communication training will be included as part of the site-specific training as specified in Section 4.2. When new chemicals are brought onto the work site or new chemical contaminants are identified, an MSDS and/or NIOSH Pocket Guide information will be added to the MSDS Binder(s) with a corresponding review by the SSHO and PS. The PS is responsible for reviewing the MSDS, identifying training needs for affected personnel and transmitting a copy of the MSDS to the SSHO. The SSHO has overall responsibility for maintenance of the MSDS Binders and potential training of personnel.

#### 4.5 CPR/First Aid and Blood Borne Pathogens

All TolTest field personnel are qualified to administer First Aid and CPR. The TolTest SSHO shall be First Aid/CPR qualified and trained in accordance with 29 CFR 1910.1030 Blood Borne Pathogens.

#### 4.6 Safety Meetings

Safety meetings for all TolTest personnel shall be conducted on a weekly basis. This is a group meeting intended to be a self assessment of safety performance and a chance to review any lessons learned as a group, plus an opportunity to introduce

specialized training topics. The meeting shall be chaired by the TolTest PS with assistance by the TolTest SSHO. This safety meeting can also be used to describe any changes in the site specific training described in Section 4.2. Safety Meetings are documented using Figure A-2 from this plan or equivalent.

#### 4.7 Plan of the Day Meetings

Plan of the Day (POD) meetings shall be held at the beginning of each shift to review the planned work of the day as well as any safety and quality concerns. The meeting is chaired by the TolTest PS or TolTest PM. The attendee's include the TolTest Quality Control representative/ SSHO and other selected personnel. The date, time, personnel attending and meeting minutes shall be documented in field log-books.

#### 4.8 Pre- Entry Briefings (Meeting)

Pre-entry briefings shall be held for employees prior to their initiating any new or differing site activity in an exclusion zone and at such other times as necessary to ensure employees are knowledgeable of the work plan activity, the Activity Hazards Analysis (AHA), and that the plan and analyses are being followed. Pre-entry briefs are the responsibility of the PS. Attendance shall be documented using Figure A-3 from this Plan.

In addition, all incidents will be promptly evaluated and the evaluation results will be communicated to personnel in POD meetings. Lessons-learned from these evaluations shall be communicated to all affected personnel.

#### 4.9 Quality Control Preparatory Phase Inspection Meeting

The TolTest SSHO shall attend all Quality Control Preparatory Phase Inspection Meetings to discuss any safety and health concerns requiring special attention and to review anticipated safety requirements for a specific definable feature of work, and to review specific air monitoring requirements.

#### 4.10 Recordkeeping

Written records of all required training and meetings shall be maintained on site by the TolTest SSHO. These records shall be made available to U.S. Navy personnel upon request.

## 5.0 Medical Surveillance Program

### 5.1 Summary of Medical Surveillance Requirements

All project personnel who work within the exclusion zone for more than three days per month, or are required to use respiratory protection regardless of the time within the exclusion zone, will participate in a medical surveillance program. The medical surveillance program is in accordance with OSHA 1910.120 and 1926.65, and Section 6 from the TolTest Safety and Health Program (TolTest associates only).

The medical surveillance program consists of a baseline or initial examination, an annual medical examination, a termination examination, and episodic medical examinations as necessary. Termination exams specific to this job have been determined not to be necessary unless specific criteria is met as discussed in the TolTest Safety and Health Program, Section 6. At a minimum, the content of the initial, annual and termination examinations shall consist of the following medical tests and procedures (or as determined by the examining physician):

- medical and occupation history;
- complete physical examination;
- pulmonary function test (FVC and FEV<sub>1</sub>);
- complete blood count, generally SMAC-22 or 24 biochemical profile;
- audiometry;
- complete urinalysis;
- resting electrocardiogram at the direction of examining physician);
- vision screen; and
- chest X-ray (PA) (every three years or at the direction of the examining physician).

An episodic examination will be required if any employee develops signs or symptoms related to the possible overexposure to hazardous substances or other health hazards, if the employee has been injured, or if the employee has been exposed above the permissible exposure limits or published exposure levels in an emergency. The scope of any episodic examination will be left to the discretion of the examining physician.

A copy of the examining physician's written opinion about the employee's ability to perform work on this hazardous waste site and use respiratory protection, and a statement that the physician has informed the employee of the results of the examination shall be kept on site.

### 5.2 Drug Abuse Prevention Program

TolTest is committed to the establishment and maintenance of a safe and efficient work environment for all employees free from the effects of alcohol, illegal drugs, other controlled substances, and prohibited items. TolTest has implemented a Substance Abuse Prevention Program, which includes pre-employment testing, periodic testing, post-accident testing, for cause testing and random testing.

### 5.3 Recordkeeping

The TolTest SSHO will arrange medical surveillance for TolTest employees. The statements by the examining physician(s) attesting to the medical qualification of individual workers shall be maintained at the project site and will remain a part of the project files. The examining physician will keep medical records. One copy of all forms and lab results will be sent to the TolTest corporate record retention office in Toledo, Ohio.

## 6.0 Personal Protective Equipment

In addition to engineering controls and administrative controls (e.g. work practices), personal protective equipment (PPE) shall be used to protect personnel from exposure to contaminants which may be encountered during activities on site. The following guidelines will be followed.

- Respirators and other PPE necessary to protect the health of employees shall be provided by their employer.
- Only NIOSH/MSHA-approved respirators and cartridges shall be used.
- The SSHO shall verify the respirator user's medical status before work requiring respirator use is performed.
- TolTest Procedure 20 shall serve as the written standard operating procedure governing the use respirators at the job site. Section 7 from TolTest Safety and Health Program shall serve as the written standard operating procedure governing the selection, use and donning/doffing of PPE at the job site.
- Respirators will be assigned to individual employees for their exclusive use and marked to indicate to whom it was assigned, for the duration of this project.

Table A-5 presents the basic levels (Level B, C, Modified D, and D) of PPE. Table A-6 lists the minimum PPE level required for each task or operation. If air sampling/monitoring indicates that modification to the levels of protection are warranted, the TolTest SSHO is empowered with the authority to authorize the modification based on the guidance provided in Table A-7, Airborne Contaminant Response Criteria or by professional judgement.

The PPE has been selected based on what is known or anticipated about the site-specific hazards. If conditions change, PPE selection and use shall be reviewed by the TolTest SSHO and the PS and upgraded or downgraded per their assessment. The TolTest SSHO shall record the rationale for the modification as a log book entry. Prior to initiation of work personnel will be trained if necessary on the use and limitations of specific PPE.

PPE will be maintained and stored in accordance with the manufacturer's recommendation and good industrial hygiene practices. Personnel will inspect PPE prior to each use to assure the PPE is clean and good working order. The PS and/or SSHO shall provide training to personnel concerning PPE inspection criteria. The SSHO shall conduct evaluations of effectiveness and usability of PPE. Logbook entries are sufficient but the data should be readily transferable to the safety and health project completion report (see Section 13.5).

## 7.0 Exposure Monitoring/Air Sampling Program

Air monitoring refers to direct real time reading of airborne concentrations and air sampling refers to time integrated air sampling, either personal or area samples. The SSHO will maintain a supply of colorimetric indicator tubes and hand pump, and one multi-gas combustible gas indicator (CGI)/ Oxygen (O<sub>2</sub>)/ Hydrogen Sulfide (H<sub>2</sub>S)/ Carbon Monoxide (CO) meter. In addition, TolTest will maintain a sound level meter and dust aerosol meter plus all time integrated air-sampling equipment. Execution of real time air monitoring will be coordinated by the SSHO in accordance with the requirements for air monitoring depicted in Table A-9. Time integrated air sampling will be completed by the SSHO.

### 7.1 General

This section describes the air sampling and air-monitoring program performed to evaluate worker exposure to potentially hazardous airborne materials and to evaluate off-site impacts. The air sampling/monitoring results will be used to:

- Assess worker exposure to potentially hazardous materials with respect to the permissible exposure limit (PEL) for air contaminants (Title 29 Code of Federal Regulations, Part 1910.1000) or other published exposure levels.
- Assess the adequacy of engineering controls and respiratory protection.
- Delineate areas where controls or respiratory protection is needed.
- Establish work control zones.

### 7.2 Monitoring

**7.2.1 Volatile Organic Compounds** - Colorimetric indicator tubes (e.g., MSA tubes) for ammonia and volatile organic compounds (VOCs) shall be used at the SSHOs discretion. Colorimetric tubes are used to characterize potential exposure. Based on reported soil sampling results, VOCs are not expected to be a significant concern. Additional compounds that may be measured using colorimetric indicator tubes include

carbon dioxide, carbon monoxide, and ammonia. If levels are detected above action levels, an immediate assessment of job controls will be made, and appropriate modifications incorporated if necessary. See Section 7.2.6 on measurement location and frequency.

**7.2.2 Airborne Dust** - Based on visible observations of excessive dust, a direct-reading, real-time instrument capable of detecting airborne dust will be used, readings will be taken at locations that reflect approximate concentrations of airborne dust in the breathing zone of project personnel. Results of the airborne dust monitoring will be documented. If necessary, the level of PPE used by personnel will be modified or engineering controls enhanced. The direct-reading, real-time monitoring equipment will be "response checked" according to the manufacturer's instructions before use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site. When such monitoring is conducted and the results are greater than approximately 1.0 mg/m total dust concentrations, immediate steps will be taken to determine the cause and modify site operations.

**7.2.3 Perimeter Monitoring** - Perimeter monitoring to evaluate emissions of airborne dust in the Support Zone will be performed periodically during soil excavation, as warranted. When such monitoring is conducted and results are greater than 1.0 mg/m<sup>3</sup>, immediate steps will be taken to determine the cause and modify site operations.

**7.2.4 Noise Monitoring** - Noise monitoring will be performed, as warranted, at the initiation of each new task or new operation. Basic sound levels from operational equipment were monitored during pilot scale and appropriate controls established. Where determined to be necessary, detailed sound level surveys and noise dosimetry will be completed at locations that best approximate the sound levels at the ear of potentially affected personnel. Noise monitoring equipment will be "response checked" according to the manufacturer's instructions prior to use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site.

**7.2.5 Heat Stress and Cold Stress Monitoring** - When temperatures at the site are above 65 ° F work/rest periods will be adjusted according to the guidelines stated in the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents*. When the clothing worn differs from the ACGIH standard ensemble such as in the case of workers wearing semi-permeable or impermeable clothing, guidelines established in the NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Section 8 should be consulted. The following is a summary from that document.

When employees are required to wear impermeable chemical protective clothing in temperatures exceeding 70 ° F, employees should monitor their pulse rate or use the "buddy system" to monitor each other's pulse rate at the start of each rest period. Table A-9 can be used to establish work/rest periods and the frequency of monitoring pulse rates.

Guidelines for the prevention of cold stress and cold stress TLVs shall follow the guidelines stated in EM-381-1-1 Section 06.J and the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents*. At air temperatures below 50°F, the air temperature and wind speed shall be monitored by the SSHO. Comparing wind speed and actual temperature shall make a qualitative assessment of cold stress risk to the assigned equivalent chill temperature depicted on Table 2 in the Cold Stress section of the ACGIH booklet. Unless there are unusual or extenuating circumstances, cold injury to other than the hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. These symptoms are described in Section 2.5.3. The uses of extra insulating clothing and/or reduction of the exposure period are among the special precautions, which should be considered.

Cold weather clothing requirements shall follow the guidance listed in Section 06.J.09 of EM-385-1-1. If work is performed continuously in the cold at an equivalent chill temperature or below 20 °f, heated warming shelters shall be made available nearby the work area and the workers encouraged to use these shelters at regular intervals.

A cold weather work/warm-up regimen shall be established when outside ambient temperature is less than a -15°F in accordance with Table 3 of the ACGIH booklet in the Cold Stress section.

**7.2.6 Other Chemical Monitoring** - During active composting at the Bioremediation Facilities, real-time monitoring using colorimetric indicator tubes for carbon dioxide, carbon monoxide and ammonia will be performed periodically by the SSHO. If carbon dioxide levels exceed 4,000 ppm inside of the structure, the structure will be evacuated and action taken to vent the structure and maintain a level below 3,000 ppm.

Also during active composting, real-time monitoring will be conducted periodically to determine if any detectable levels of methane, carbon monoxide, and ammonia are present. Monitoring for ammonia will be completed using colorimetric indicator tubes. Monitoring for methane and carbon monoxide will be completed using the multi-gas meter. If levels are detected above action levels, an immediate assessment of job controls will be made, and appropriate modifications incorporated where necessary.

### **7.3 Air Sampling**

**7.3.1 Explosives Residues** - Time-integrated air sampling for explosive residues as airborne aerosols using personal air sampling pumps will be performed by the SSHO during composting when the windrows are mixed and composting process parameters are monitored. Sample collection will be based on OSHA Method 44 and sample analysis will be conducted in accordance with EPA Method 8330 using High-Pressure Liquid Chromatography (HPLC) Analysis. Refer to the detailed operating procedure found in Attachment C.

**7.3.1.1 Material and Method** - OSHA 44 - collect on sorbent and filter tube, 270/140 XAD-2 and glass fiber filter, OSHA Versatile Sampler (OVS) Tube. Volume = 240 Liter (L), rate = 1.0 Liter per minute (L/min), time = approximately 4 hours. Analysis by HPLC in accordance with EPA Method 8330 provides a scan for specific analytes and isomers. Specific analytes include HMX; RDX; 1,3,5-TNB; 1,3-DNB; Tetryl; Nitrobenzene; 2,4,6-TNT; 4-Amino-2,6-DNT; 2-Amino-4,6-DNT; 2,4-DNT; 2,6-DNT; 2-Nitrotoluene; 3-Nitrotoluene; and 4-Nitrotoluene.

7.3.1.2 **Sampling Strategy** - Every calendar quarter during composting, four personal samples and three area samples of full shift duration, or if necessary, split shift duration will be obtained from the maximally exposed individuals. Area samples will be obtained inside of the composting structure near the work area during active composting. The sample pump and media will be positioned at approximately 1.5 meter (m) above the floor. Area samples should be biased by representing the worst-case exposure.

7.3.2 **Biological Hazards** - Two time-integrated air sampling campaigns (one in late spring, another in the summer) for bioaerosols will be performed by the SSHO. The air sampling will take place inside the Bioremediation Facilities during active composting. Results will be compared to background samples taken at a location outside of the perimeter of the Bioremediation site. Refer to Attachment C, Chemical Hygiene Plan.

#### 7.3.2.1 **Material and Method**

- a. Collect airborne aerosols by impaction on pre-selected growth media plates using a high volume sampling pump with single stage Andersen Impactor calibrated using 4-L glass calibration jar with calibration specific culture plates. The sampling flowrate is 28.3 L/min and sampling time will be set at 5 minutes. Samples will be obtained for the total fraction. Standard Method Agar (SGA) will be the growth media selected for bacteria, and acidified Potato Dextrose Agar (PDA) for fungi (yeasts and molds) unless changed based on recommendations from microbiology laboratory.

A separate growth media will be used for each of the following constituents and analyzed accordingly:

1. Total bacteria (total plate count), subculture from bacteria plate for pathogenic species looking especially for *E.coli* as a marker from manure.

2. Total plate count for Fungi (molds and yeast), looking especially for the fungus *Aspergillus fumigatus*.

7.3.2.2 Sampling Strategy - For each sampling campaign, ten area samples will be obtained inside of the composting structure and ten area samples outside of the structure approximately 100 m upwind from the composting structure. The samples will be obtained approximately two and three days into the composting process. Samples inside of the structure will be taken during turning and immediately after the windrows are turned.

One sample set consists of the following:

Bacteria - 1 culture plate

Fungi - 1 culture plate

Therefore one sample set inside of the structure for bacteria will require 10 culture plates and one sample sets for fungi inside of the structure will require 10 culture plates for a total of 20 culture plates. Subsequent bacterial pathogen isolations are to be performed by streaking for isolation, using morphologically distinct representative colonies, onto SMA from the inoculated plates. The initial SMA Plates are to be incubated and single consistent colonies inoculated onto selective and differential agars to culture for the following species of bacteria or as modified by the microbiology laboratory: *Pseudomonas aeruginosa*; *Pseudomonas fluorescens*; *Pseudomonas putida*; *Pseudomonas cepacia* (approximately 50% of strains); *Pseudomonas pseudoalcaligenes* (approximately 50% of strains); *Pseudomonas species VE-2* (approximately 50% of strains); *Staphylococcus aureus*; *Staphylococcus epidermis*; *Escherichia coli (E.coli)*; *Salmonella typhi*; *Salmonella enteritidis*; *Salmonella choleraesuis*; *Citrobacter freundii*; *Citrobacter diversus*; *Citrobacter amalonnaticus*; *Enterobacter cloacae*; *Enterobacter aerogenes*; *Enterobacter agglomerans*; *Enterbacter gergoviae*; *Proteus vulgaris*; and *Morganella morganii*. An estimated of 4 field culture blanks (2 SMA plates and 2 acidified PDA plates) will be obtained in the field.

**7.3.3 Wipe Sampling for Explosives Residues** - Every calendar quarter wipe samples will be obtained by the SSHO and analyzed for explosive residues. The results will be used to assess the effectiveness of PPE controls and decontamination procedures.

**7.3.3.1 Material and Method** - Collect wipe samples using glass fiber filters pre-wetted with acetonitrile. Obtain random surface samples from the personnel decontamination shower trailer, specifically the change room area and the lunch/conference room. Samples are obtained by wiping through a 100 square centimeter (cm<sup>2</sup>) template moving in concentric squares from the outside to the inside of the sampling area. After wipe sampling, the media is folded with the exposed side in, placed in a sampling vial, and sent to the laboratory for analysis. Clean latex gloves shall be worn for each sample collected.

**7.3.3.2 Sampling Strategy** - Samples are obtained randomly and unannounced. Approximately 5 samples will be collected and analyzed for explosive residues.

#### **7.4 Air Monitoring and Sampling Requirements**

Air monitoring and sampling requirements are shown in Table A-9.

#### **7.5 Recordkeeping and Chain of Custody**

Written records of all monitoring will be maintained on site and affected employees will be notified of monitoring results representative of their exposure. For industrial hygiene sampling requiring collection and shipment of a sample to an approved analytical laboratory, Chain-of-Custody forms will be properly completed and accompany all collected samples. The selected AIHA accredited industrial hygiene lab will be SouthWestern. Turn-around time will be set at 5 working days.

## **8.0 Standard Operating Safety Procedures, Engineering Controls and Work Practices**

### **8.1 General Safety**

Operations shall be conducted in a safe manner consistent with the policies and procedures outlined in this SSHP. The number of personnel shall be restricted to the minimum necessary to complete the required work as an administrative control to limit personnel exposures to potential site chemical, physical and biological hazards. All project personnel assigned to this project are responsible for following this SSHP and for using safe work practices including wearing the PPE specified by the SSHO. Project personnel shall report hazards and unsafe conditions and practices to the SSHO. All federal, state and local occupational health and safety regulations must be complied with by project personnel. Violations of project procedures may include disciplinary measures up to and including termination.

### **8.2 Procedures**

- TolTest shall have available first aid kit including CPR kit (Pocket Mask) and biohazards control kit; emergency eyewash (where necessary); and spill response equipment (where necessary) available at each controlled work location. TolTest shall complete the Soil Excavation Maps and post it at each work site including emergency phone numbers. Work zone signs shall be posted in accordance with the requirements of Section 9.1.4 of this SSHP.
- Do not eat, smoke, take medications, chew gum or tobacco, or put objects in mouth while in the exclusion zone and contamination reduction zone or when handling samples. Drinking fluids for heat stress is allowed in the CRZ as established by the SSHO.
- After handling samples, thoroughly wash hands and, if necessary, face, before eating or putting anything in mouth (i.e., avoid hand-to-mouth contamination).

- At a minimum, wear safety glasses and sturdy work boots when inside the work boundaries.
- Remain a safe distance from the excavation equipment when not involved in operation or monitoring activities.
- Do not under any circumstances enter or ride in or on any backhoe/excavator bucket, materials hoist or any other device not specifically designed for carrying human passengers.
- Remain aware of your own and other's positions with regard to rotating equipment and be extremely careful when assembling, lifting and carrying items that may cause pinch point injuries and collisions.
- Be alert to the symptoms of fatigue, heat stress and cold stress and their effect on the normal caution and judgment of personnel.
- Use ground fault circuit interrupters (GFCI) with all portable electrical tools and equipment.
- Stand clear of trenches during excavation. Always approach the excavation from upwind.
- Stand upwind, whenever possible, of excavations and other sites where the soil has been disturbed.
- Be alert to potentially changing exposure conditions as evidenced by perceptible odors, unusual appearance of excavated soils, oily sheen on water, or other evidence of possible contamination.
- Do not enter any excavation or trench greater than five feet in depth unless authorized by the SSHO.

- Use good housekeeping practices with regard to tools and material whenever possible to avoid tripping hazards and the spread of contamination.
- Use the buddy system at all times while working at the site in controlled work zones. No one is to work alone in the Exclusion Zone or Contamination Reduction Zone without permission from the SSHO and PS.
- Minimize truck tire disturbance of all stabilized sites and areas beyond the work area boundaries.
- Cease all work operations on the site at sunset unless the control zone is adequately illuminated.
- PS shall attend the POD meeting prior to the start of the work and conduct pre- entry briefs with all affected workers.
- Avoid direct contact with contaminated materials unless necessary for sample collection or required observation. PPE shall be worn at all times, as required.
- Remove disposable clothing and follow decontamination procedures.
- Always use an appropriate level of personal protection as assigned in this SSHP. Lesser levels of protection can result in otherwise preventable exposure.
- Maintain a high level of awareness of the limitations in mobility, dexterity and visual impairment inherent in the use of Level B and Level C PPE.
- Establish prearranged hand signals or other means of emergency communication when wearing respiratory equipment, since this equipment impairs speech communication.

- Wear hearing protection if you have to shout to communicate at a distance of three feet in steady-state (continuous) noise or when you expect loud impact noise from certain activities. The SSHO will assess potential noise exposure and provide recommendations on correct hearing protection devices.

## 9.0 Site Control Measures

Work zones will be established and the flow of personnel and equipment will be controlled when a potential for worker exposure to hazardous substances or physical hazards exists. The establishment of work zones will ensure that work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

Prior to the commencement of remedial field activities, ToITest shall establish work zones. These work zones are depicted on Soil Excavation Figures contained in Appendix E of the Operational Plan. In addition to the zones, data will be added in the field to show assembly points and emergency communications equipment. The list of emergency phone numbers shall be posted with the Soil Excavation Map.

### 9.1 Exclusion Zone

The exclusion zone (EZ) is the area where hazardous substances or physical hazards are present or expected. Entry into this area is limited to personnel required to perform the work who are wearing the specified PPE and have attended a Pre-Entry Briefing. Everyone entering the EZ shall have completed the required health and safety training and will participate in the medical surveillance program as necessary. The boundary of the EZ will be determined for each activity and may change depending on activities and conditions.

An EZ will be established to encompass the contaminated area. The EZ will be clearly delineated with signs, barricade tape, fences, or other suitable means. Access control points will be established to regulate the flow of personnel and equipment in an out of the zone and to help verify that proper procedures for entry and exit are followed. PPE levels in the EZ are initially scoped as Level C, depending on the task listed in Table A-6. Decontamination will follow guidelines established in Section 10. Gross

contamination will be removed in the EZ followed by additional decontamination in the CRZ. The SSHO will monitor activities in the EZ from his position in the CRZ.

### 9.2 Contamination Reduction Zone

The contamination reduction zone (CRZ) is the transition area between the contaminated area, the EZ and the clean area, the support zone (SZ). While designed primarily to reduce the possibility of the SZ becoming contaminated or affected by EZ activities, the CRZ is also used for decontamination of personnel and equipment. No personnel or equipment will be allowed to exit the CRZ and EZ without being properly decontaminated (except in emergency situations). The immediate area around the EZ extending outward as much as necessary to accommodate the complete length of the longest piece of heavy equipment will be designated the CRZ. Used PPE will be removed and stored in properly marked containers.

### 9.3 Support Zone

The SZ is the outermost area of the site and is considered a non-contaminated or clean area. The SZ contains the site office, first aid stations, and other investigative and cleanup support.

Normal work cloths are appropriate apparel within this zone; potentially contaminated personal clothing, equipment, etc., are not permitted. No equipment or personnel will be permitted to enter the SZ from the exclusion zone without first passing through the CRZ.

### 9.4 Work Zone Controls

Before site operations begin, the TolTest site office shall be identified with signs identifying as such. TolTest shall post signs at entrances to the CRZ and EZ stating the following or equivalent:

HAZARDOUS AREA KEEP OUT  
AUTHORIZED PERSONNEL ONLY  
PERSONAL PROTECTIVE EQUIPMENT IS REQUIRED IN THIS AREA

TolTest shall post signs at the entrance to the CRZ before operations begin, stating:

**NO SMOKING, DRINKING OR EATING BEYOND THIS POINT**

## **10.0 Personnel and Equipment Decontamination and Hygiene Procedures**

All personnel, clothing and equipment leaving an exclusion zone (contaminated or potentially contaminated area) shall be inspected and, if necessary, decontaminated to remove any potentially harmful substances. Some equipment/clothing may be disposed of rather than decontaminated. In this case, the used PPE and/or equipment (e.g. disposable sampling equipment) will be stored in properly marked containers in the CRZ. A temporary decontamination station will be constructed at the excavation site and a permanent decontamination facility has been constructed at the Bioremediation Facility. This section gives guidelines regarding the decontamination and hygiene procedures to be implemented. Final details will be described during the site-specific safety and health briefing prior to commencing field operations.

### **10.1 Emergency Personnel Decontamination**

Based on the type of emergency that is postulated, the following types of response actions are anticipated for personnel emergencies within the exclusion zone.

A. Critical Triage Condition (life threatening) - Emergency evacuation or extrication from the EZ to CRZ where emergency medical treatment and stabilization will be attempted until arrival of first responding medical unit. Or, emergency medical treatment and stabilization will be completed in the EZ until arrival of first responding medical unit. In either case, gross decontamination will be completed to the extent possible by removal PPE, wiping patient down to remove contamination and/or wrapping patient to prevent spread of contamination.

B. Marginal Triage Condition (non-life threatening) - patient will be evacuated from EZ and treated in the CRZ followed by decontamination and patient preparation for transport to emergency medical facility. Decontamination could occur first followed by medical treatment in selected scenarios.

### **10.2 Personnel Decontamination**

Decontamination (decon) stations will be established in the CRZ. The decon stations will consist of the following, as appropriate:

- Equipment drops.
- Boot wash station.
- Disposable clothing drop. All contaminated or potentially contaminated disposable clothing shall be placed into labeled 6-mil plastic bags within an appropriate container.
- Three-stage respirator decon station.
- Personal showers and washing facilities consisting of water, towels and soap. Street clothing shall be stored in lockers provided at the shower facility. Note: this facility is located at the Bioremediation Facility.

### 10.3 Equipment Decontamination

All equipment/tools used in the EZ will be inspected for contamination prior to removal from the site. Any equipment/tools with visible contamination will be cleaned prior to removal from the site. All water used during decontamination will be contained for disposal. Construction and field equipment will be decontaminated at each temporary decontamination facility. If contamination can not be removed on-site, the affected surfaces of the equipment will be wrapped in plastic and transported to the Bioremediation Facility where more thorough decontamination can be performed prior to release.

### 10.4 Washing Facilities

A hand and face washing facility shall be made available in each CRZ.

### 10.5 Decontamination Wash Water

Equipment and personnel decontamination areas will be designed to allow for collection of all wash/rinse waters.

### 10.6 Sanitation and Personal Hygiene

Personnel exiting the CRZ are required to thoroughly wash their hands and face prior to eating, drinking, smoking, or using toilet facilities. Adequate toilet, hand washing and lunchroom facilities free of contaminants shall be designated by ToITest.

## **11.0 On-Site First Aid and Equipment**

### **11.1 First-Aid and Medical Facilities Requirements**

At a minimum, TolTest shall maintain 16-unit first aid kits in their office trailer and at each work site. The location of the first aid kit shall be communicated to project personnel as part of the site-specific and pre-entry brief training. Included with the first aid kit shall be a CPR pocket mask and a biohazards control kit (universal precautions and clean up kit). The SSHO can require upgrades to the first aid equipment requirements as deemed necessary for this job (e.g. insect repellants and sunscreen)

An emergency eyewash and spill control kit (as appropriate) will be stationed at each controlled work area. The Bioremediation Facilities will have stationary eyewash/drench equipment. The emergency phone number list and route map to medical facilities shall be posted at each office trailer and at each controlled work zone as part of the TolTest prepared Soil Excavation Maps.

### **11.2 Report of First Aid Cases**

All first aid cases, accidents and incidents shall be promptly reported to the TolTest SSHO. The TolTest SSHO shall immediately notify the TolTest Corporate Health and Safety Manager and the Navy Technical Representative (NTR) or the Navy Resident Engineer in Charge of Construction (REICC) of all accidents and incidents even if preliminary information is available. The TolTest SSHO and TolTest PM shall follow the guidance presented in Standard Operating Procedure 1.0

A written report of the accident/incident must be provided to the ROICC or REICC and TolTest Program Manager within 24 hours of the incident via memo form. The report in memo form should include as attachments the following:

- a. Employer's First Report of Injury (Workman's Comp Insurance Form)
- b. Contractor Significant Incident Report (CSIR) forms
- c. Any records provided by the Medical Service Provider such as 1) Hospital Emergency room Report, 2) Examining Physician's designation of work restriction, and 3) Examining Physician's Work Release.

## **12.0 Emergency Response Plan and Contingency Procedures**

This section has been moved to Section 11.0 of the Operations Plan.

## **13.0 Logs, Reports, and Recordkeeping**

### **13.1 Safety and Health Logbook**

The TolTest SSHO shall maintain a Project Safety and Health Logbook for the duration of work activities at the site. The logbook will contain specific information recorded on a daily basis. The logbook will contain specific information on safety and health activities. Records of training and site orientations and briefings including pre-entry briefs shall also be maintained in file folders by the SSHO.

### **13.2 Reports**

The TolTest SSHO shall prepare a weekly site safety and health inspection report. This report shall identify work activities, safety and health-related deficiencies, and corrective measures. As a minimum, the TolTest SSHO shall complete the checklist shown in Figure A-4. All near miss incidents and incidents that result in property damage, personnel injuries or illness will be investigated and notification/reporting requirements shall be followed in accordance with PHSP 04.1.

### **13.3 Field Master Copy of SSHP**

The TolTest SSHO shall maintain a field master copy of this SSHP document to include all redlines. This copy shall be properly filed with project records at the completion of the project and sent to TolTest PMO office in Toledo, Ohio.

### **13.4 Recordkeeping**

The TolTest SSHO shall maintain records of all injuries and illnesses for TolTest employees only incidental to the work in accordance with 29 CFR 1904, including copies of the Worker's Compensation First Report of Injury. Accidents and Incidents data reporting requirements shall be managed in accordance with Program Procedure PHSP-04.1 for both TolTest and Subcontractor personnel as stated in Section 11.3. A record of all first aid treatments not otherwise recordable shall be maintained and furnished to the Navy's designated authority upon request.

### **13.5 Safety and Health Project Completion Report**

The ToITest SSHO shall complete a safety and health project completion report at the conclusion of the fieldwork associated with the first year of full-scale operations. The purpose of the report is to a self assessment summarizing effectiveness of the safety and health program implemented in the field; lessons learned and suggestions for program improvement; accident and incidents; air monitoring and sampling results including ratings on instrument usability; and how well the original prepared AHA worksheets reflected field conditions. The report shall be directed to the ToITest Program Health and Safety Manager.

## 14.0 On-Site Work Plans

A Full-Scale Operational Plan has been prepared of which this SSHP document is designated Appendix A.

## **15.0 Communication Procedures**

### **15.1 Radio Communication, Telephone, Alarms and Drills/Exercises**

Two-way radios in coordination with office telephones will be the primary choice of emergency communication. An emergency alarm, such as an air horn, shall be available if necessary at each major work site to warn personnel of an emergency. Personnel shall be trained on what actions they are to take if the alarm is sounded to include evacuation routes and assembly points. Drills and exercises shall be conducted to ensure that communication methods are adequate. The ToITest SSHO will test the two-way communication system for confirmation of emergency communication using NSWCrane protocols.

## **16.0 Spill Containment Plan**

This section has been moved to Section 11.0 of the Operations Plan.

## **17.0 Confined Spaces**

Permit-required confined space entry is not anticipated on this project. If any confined space entries are necessary on this project, ToITest Procedure 9.0 found in the Industrial Hygiene Procedures Manual (ToITest 1994a) will be followed.

## **TABLES**

**Table A-1  
Site Description and Contaminants**

Identifier	Location/Description	Scope of Work	Contaminants
SWMU 12/14	Mine Fill A, west central portion of NSWC, H-17 off of H-45.	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Major contaminants include TNT, HMX and RDX in soils are the most significant.
SWMU 13/14	Mine Fill B, west central portion of NSWC, H-17 off of H-45	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Major contaminants include TNT, HMX and RDX in soils are the most significant. PCB soils are present in different areas.
Bioremediation Facility	Located south of Burns City Gate off of H-161.	Soil excavated from SWMU 12/14 will be processed at this facility using composting technology.	Contaminants in Soil to be processed and mixed with amendments are described in Section 1.2.

**Table A-2  
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Acetone (may occur in very low levels if any at all)	Colorless liquid with a fragrant, mint-like odor.	OSHA PEL of 1000 ppm as 8 hr TWA.	Irritant to eyes, nose, and respiratory system. May cause dermatitis upon skin contact.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Ammonia (varying levels, off gas component from manures) (considered highest chemical hazard on this job)	Colorless gas with a pungent, suffocating odor.	OSHA STEL of 50 ppm. NIOSH REL of 25 ppm, STEL of 35 ppm. ACGIH TLV-TWA of 25 ppm and STEL of 35 ppm.	Irritant to eyes, nose and throat.	Remove to fresh air. Irrigate eyes immediately with water. Provide respiratory support. Seek medical attention immediately.
Carbon Dioxide, off-gas component of aerobic composting.	Colorless, odorless gas. Normal constituent of air, about 3,000 ppm.	OSHA PEL of 5,000 ppm.	Cause headache, dizziness, restlessness; dyspnea, increased heart rate, pulse and blood pressure; convulsions and asphyxia at high concentrations	Provide respiratory support. Seek medical attention immediately.
Hydrogen Sulfide (May be off gas component of composting)	Colorless gas with a strong odor of rotten eggs.	OSHA Ceiling of 20 ppm, NIOSH Ceiling of 10 ppm.	Irritant to eyes and respiratory system. Causes dizziness, headache and eye pain. CNS depressant. Asphyxiant.	Irrigate eyes immediately with water. Provide respiratory support. Seek medical attention immediately.
Diesel exhaust including oxides of nitrogen.	Appearance and odor vary depending upon the specific diesel exhaust component.	Use STEL of 1 ppm.	Irritant to eyes and respiratory system, may cause pulmonary function changes.	Remove to fresh air, provide respiratory support. Seek medical attention immediately.

<p>DNT (Dinitrotoluene)</p> <p>(Majority of amino DNTs undetected in soil samples, can exist as metabolite during composting)</p>	<p>Orange-yellow crystalline solid with a characteristic odor.</p> <p>Note: skin designation.</p>	<p>OSHA PEL 1.5 mg/m<sup>3</sup> as 8 hr. ACGIH 8 hr TWA of 0.15 mg/m<sup>3</sup></p>	<p>Causes anoxia; cyanosis; anemia; jaundice; reproductive effects; suspected human carcinogen.</p>	<p>Irrigate eyes immediately with water. Water flush promptly. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.</p>
<p>HMX (Cyclotetramethylenetetra nitramine)</p>	<p>White-crystalline solid.</p>	<p>No exposure limits listed.</p>	<p>May cause Irritation to eyes, skin and respiratory system.</p>	<p>Irrigate eyes immediately with water. Water flush promptly. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.</p>
<p>RDX (Cyclonite)</p>	<p>White crystalline powder, combustible solid.</p>	<p>OSHA PEL 1.5 mg/m<sup>3</sup> as 8 hr. ACGIH 8 hr TWA of 1.5 mg/m<sup>3</sup></p> <p>Note: skin designation</p>	<p>Skin, eye and respiratory irritations. Very similar to TNT.</p>	<p>Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.</p>
<p>TNT (Trinitrotoluene)</p>	<p>Colorless to pale yellow, odorless solid or crushed flakes. Combustible solid.</p>	<p>OSHA PEL 1.5 mg/m<sup>3</sup> as 8 hr. TWA, ACGIH 8 hr TWA of 0.5 mg/m<sup>3</sup>.</p> <p>Note: skin designation.</p>	<p>Causes liver damage, jaundice; cyanosis; sneezing; cough; sore throat; peripheral neuropathy; muscle pain, kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia and cardiac irregularities.</p>	<p>Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.</p>

<p>Biological constituents to include bacteria and fungi (yeasts and molds). Constituents will be present in amendments and may become airborne during composting operations.</p>	<p>Microbiological organisms</p>	<p>None established, will compare to background levels or other data from current literature. Bacterial or fungal concentrations above 10,000 colony forming units per meter cubed (cfu/m<sup>3</sup>) in total or above 500 cfu/m<sup>3</sup> for each specific group of organisms or species of a potentially pathogenic nature should be considered a threat to the worker s health. For gram-negative bacteria, a TLV of 1000 cfu/m<sup>3</sup> has been proposed, since a number of species of this group are able to release pathogenic endotoxins, which may cause an additional health hazard.</p>	<p>Varies, depending on sensitivity. Can include respiratory system irritation, distress and infections.</p>	<p>Remove from source, seek medical attention.</p>
<p>Note: Data is Table derived from NIOSH 1994, OSHA 1997 and ACGIH 1996-1997.</p>				

**Table A-3 Personnel Contacts and Telephone Numbers**

<u>Person or Agency</u>	<u>Telephone</u>
<b>NSWC Crane Fire Department (Base)</b>	<b>1333 emergency (812) 854-1235</b>
<b>NSWC Crane Ambulance (Base)</b>	<b>1333 emergency (812) 854-1100</b>
<b>NSWC Crane Security (Base)</b>	<b>(812) 854-3318</b>
<b>NSWC Crane Environmental Protection Department</b>	<b>(812) 854-4423</b>
<b>Chief Duty Officer (CDO)</b>	<b>(812) 854-1225</b>
<b>Crane Army Ammunition Activity (CAAA) Security</b>	<b>(812) 854 3960</b>
<b>ROICC (NTR)</b>	<b>(812) 854-3318</b>
<b>SOUTHNAVFACENCOM</b>	<b>(803) 743-0582</b>
<b>NSWC Crane E.O.D. (Base)</b>	<b>(812) 854-3456</b>
<b>NSWC Crane Safety Director</b>	<b>(812) 854-3601</b>
<b>Poison Control Center</b>	<b>(800) 942-5969</b>
<b>NSWC Base Medical Facility</b>	<b>(812) 854-1220, 4319</b>
<b>Bedford Medical Center, 2900 West 16th Street, Bedford, IN 47432</b>	<b>(812) 275-1200</b>
<b>Bloomington Hospital, 601 West Second Street, Bloomington, IN</b>	<b>(812) 336-9515</b>
<b>NSWC Crane Public Works Department (Base)</b>	<b>(812) 854-1834</b>
<b>TolTest Program Manager (Ernest Enrique)</b>	<b>(419) 241-7175</b>
<b>TolTest NSWC Site Project Manager (Lance Parsons)</b>	<b>Office (812) 854-6942 Home (812) 636-4877</b>
<b>TolTest NSWC Site Superintendent (Denny Waggoner)</b>	<b>Office (812) 854-6941 Home (812) 247-2266</b>
<b>TolTest NSWC Site Safety and Health Officer (SSHO) (Travis Nowak)</b>	<b>Office: (812) 854-6942</b>
<b>TolTest Project Engineer (Toledo, OH office)</b>	<b>419-241-7175</b>
<b>TolTest Site Quality Assurance/Quality Control Representative</b>	<b>Office: (812) 854-6941</b>
<b>TolTest Health and Safety Program Manager (Toledo, Ohio)</b>	<b>(419) 241-7175</b>

**Table A-3 Personnel Contacts and Telephone Numbers**

NSWC Crane PWD/Eng. Dept	(812) 854-1834
NSWC Base Commander	(812) 854-1210
USEPA (Region 5) Emergency	(312) 353-2318
IDEM, State of Indiana Emergency	(317) 233-7745
National Response Center	(800) 424-8802

**Directions to NSWC Medical Department On-site:**

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of H-2 just north of H-5.

**Directions to Bedford Medical Center:**

From the Bloomington Gate, head east on Highway 58 to the city of Bedford, turn left onto 16th. This Gate is open 24 hours. The approximate distance to hospital is 22 miles.

From the Bedford Gate, head east on Highway 158 to the city of Bedford, 158 turns left onto 16th Street. The distance to hospital is approximately 22 miles. This gate is open during the hours of 6 AM to 8 AM and 3 PM to 6 PM on Mondays through Fridays exclusive of holidays.

**Directions to Bloomington Hospital:**

Exit NSWC Crane on H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead over the bypass (Bloomfield Road), and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street and the hospital will be on right-hand side of the road.

**Note: TolTest SSHO is to ensure this Table and Figure A-1 are included with the Soil Excavation Maps posted at the job site. In addition, the Table and Figure must be posted at each office location.**

Notify the TolTest SSHO of any changes in work conditions which may affect the health and safety aspects of the task. The Superintendents or designated supervisors are responsible for conducting Plan-of-the-Day meetings and Pre-Entry were necessary, weekly safety meetings, and conducting or ensuring that other training is completed.

**Table A-4  
Training Requirements**

Identifier	Location	40-Hr. Haz. Waste	Haz. Waste Annual Ref.	Haz. Waste Supervisor	Weekly Safety Mtg.	Haz. Com.	CPR/ First Aid	Respiratory Protection	Site-Specific	POD, Pre-Entry Brief	Other
SWMU 12/14	Mine Fill A	Y	Y	Y	Y	Y	Y	Y	Y	Y	N <sup>2</sup>
SWMU 13/14	Mine Fill B	Y	Y	Y	Y	Y	Y	Y	Y	Y	N <sup>2</sup>
Full Scale operation of facility	Bioremediation Facility	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y <sup>1,2,3</sup>

Y = Yes, N = No, O = Optional

Notes:

- 1 - 49 CFR Part 172 Subpart H for personnel required to classify, mark, select packaging, inspect, load and transport hazardous materials.
- 2 - Fire Extinguishers
- 3 - Chemical Hygiene Plan for Laboratory Workers

**Table A-5 Selection of Personal Protective Equipment**

PPE	Level D	Modified Level D	Level C	Level B
Coveralls or other approved working apparel	Yes	Yes	Yes	na
Chemical-resistant clothing (coveralls; hooded, one- or two-piece chemical-resistant coveralls)		Yes	Yes	na
Boots, chemical resistant	Yes	Yes	Yes	na
Boot covers (outer), chemical resistant (disposable)		Optional	Optional	na
Safety glasses or chemical splash goggles, meeting ANSI Z87.1-1979 for "Industrial Safety Glasses"	Yes	Yes	Yes	na
Face shield	Optional	Optional	Optional	na
Gloves (cotton/leather)	Optional	Optional	Optional	na
Gloves (inner), chemical resistant or liners		Yes	Yes	na
Gloves (outer), chemical resistant		Yes	Yes	na
Approved Disposable Dust Mask		Optional		na
Air-purifying respirator, half-face or full face with suitable cartridge (MSHA or NIOSH approved)			Yes	na
<p>Note: Optional requirements to be determined by the ToITest SSHO based on additional evaluation of site conditions and hazards analysis. Note: safety glasses not required when wearing full-face APR.</p> <p>Na - not applicable</p>				

**Table A-6  
Minimum Personal Protective Equipment Requirements by Task**

Site	Activity	PPE
Soil excavation at SWMU #12/14 & SWMU # 13/14	<ol style="list-style-type: none"> <li>1. Excavate, screen, and load soils for Composting</li> <li>2. Site restoration</li> <li>3. Decontamination and rock washing</li> <li>4. Transporting contaminated soil (driving trucks)</li> </ol>	<ol style="list-style-type: none"> <li>1. Modified Level D, modify based on air monitoring/sampling results.</li> <li>2. Level D</li> <li>3. Modified Level D, use rain suit</li> <li>4. Level D</li> </ol>
SWMU Sampling	<ol style="list-style-type: none"> <li>1. Obtain soil and/or <del>groundwater</del> water samples</li> </ol>	<ol style="list-style-type: none"> <li>1. Modified Level D</li> </ol>
Full Scale Operations of Bioremediation Facility	<ol style="list-style-type: none"> <li>1. Offload and grind amendments</li> <li>2. Load amendment blend in windrows</li> <li>3. Offload contaminated soil into windrows</li> <li>4. Turn and mix windrows</li> <li>5. Monitor windrow parameters and field screening/confirmation sampling</li> <li>6. Load and transport treated soils</li> <li>7. Decontamination water management</li> <li>8. Composting building housekeeping</li> <li>9. Maintenance and Upkeep of Equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. Level C, modify where necessary.</li> <li>2. Level C, modify where necessary.</li> <li>3. Modified Level D.</li> <li>4. Level C, modify where necessary.</li> <li>5. Level C if working in building during windrow turning. Modify when necessary.</li> <li>6. Level D</li> <li>7. Modified Level D.</li> <li>8. Level C, modify where necessary.</li> <li>9. Level D, modify per task based on manufacturer's recommendation.</li> </ol>

Level C respiratory protection includes full-face air purifying respirator (APR) with Ammonia/Methylamine Cartridge/P100 Filters. Existing inventory of HEPA/ammonia cartridges may be used until supply is exhausted.

Clothing includes dedicated coveralls; 16 inch PVC boots; Tyvek; double nitrile gloves; safety glasses.

Modified Level D includes same protective clothing as Level C except for Dust Masks instead of APR. Where specified, Dust Masks should be 3 M Brand 8210 (N95) or Brand 8511 (N95). Dust Masks must be replaced at minimum of daily per manufacturers instructions. Existing inventory of 3M Brand 8710 Dust/Mist Respirator may be used until supply is exhausted.

In some cases leather work gloves can be substituted for chemical protective gloves (e.g. handling amendments, off-loading amendments and building maintenance).

**Table A-7  
Airborne Contaminant Response Criteria**

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Explosives Residues	Less than action level for the explosive compound having the lowest AL (DNB, 0.5 mg/m <sup>3</sup> ) and/or no visible observation of excessive dusts	Modified Level D	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	Level C	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m <sup>3</sup> total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
Hydrogen Sulfide	Greater than 10 ppm	To be determined by SSHO	Periodic per plan inside of Composting Facility	Stop work, shut off equipment and evacuate Composting Facility. Notify SSHO; ventilate structure

Carbon Dioxide (CO <sub>2</sub> )	Greater than 4,000 ppm	To be determined by SSHO	Periodic per plan inside of Composting Facility	Stop work, shut off equipment and evacuate Composting Facility. Notify SSHO; ventilate structure
Ammonia Off-gas from Compost Piles	Greater than 25 ppm and < 300 ppm  > 300 ppm	Level C  Supplied Air respiratory protection	Periodic per plan inside of Composting Facility  To be determined by SSHO	Level C PPE to be used.  Stop work, shut off equipment and evacuate Composting Facility. Notify SSHO; ventilate structure, and upgrade respirator protection if entry required.
% LEL	Equal to or greater than 10%.	To be determined by SSHO	To be determined by SSHO	Stop work, shut off equipment, remove ignition sources if safe to do so; notify SSHO

<b>Table A-8 Frequency of Physiological Monitoring for Fit and Acclimatized Workers<sup>1</sup></b>	
ADJUSTED TEMPERATURE <sup>2</sup>	IMPERMEABLE ENSEMBLE
90°F (32.2°C) or above	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 120 minutes of work
<p><sup>1</sup>For work levels of 250 kilocalories/hour.</p> <p><sup>2</sup>Calculate the adjusted air temperature (ta adj) by using this equation:</p> $ta\ adj\ ^\circ F = ta^\circ F + (13 \times \% \text{ sunshine}).$ <p>Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow.</p> <p>(100 percent sunshine = no cloud cover and a sharp, distinct shadow: 0 percent sunshine = no shadows.)</p> <p><b>Note:</b> Reprinted from <i>Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities</i> (1985).</p>	

**Table A-9  
Monitoring and Sampling Requirements**

Site	Activity	Monitor				Sample	
		Dust	Perimeter (Dust)	Noise	Heat Stress	Biological	Explosives
SWMU 12/14	1. Excavate, screen, and load soils for Composting	Y	Y	Y	O	N	Y
Start-up and Operations of Bioremediation Facility	1. Offload and grind amendments.	Y	Y	Y	O	O	N
	2. Load amendment blend in windrows.	Y	N	Y	O	Y	N
	3. Offload contaminated soil into windrows.	Y	N	Y	O	N	N
	4. Turn and mix windrows.	Y	Y	Y	O	Y	Y

Y = Yes, O = Optional at discretion of SSHO, N = Not required

Notes:

1 = See Section 7 for additional monitoring using colorimetric indicator tubes.

## FIGURES

**Figure A-1 Directions to Nearest Emergency Medical Facilities**

See Following Page for 11" X 17" foldout





### Figure A-4 SSHP Weekly Inspection Checklist

Surveillance No. \_\_\_\_\_

SURVEILLANCE NO:	ACTIVITY:	PROJECT NO:
DATE:	LOCATION:	SURVEYED ORGANIZATION:
	SITE/AREA CONTACT:	PRIME:
		SUBTIER:

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
1	Activity hazard analysis prepared for each major work phase? (EM 385-1-1, Section 01.A.09)						
2	All hazards including chemical/biological and physical adequately described?						
4	All site personnel completed required training?						
5	All site personnel medically qualified?						
6	PPE available and in good condition?						
7	PPE work per SSHP and/or SSHO direction?						
8	PPE donning/doffing procedures in place?						
9	Written SOP available describing respirator selection and use?						
10	Air monitoring conducted per SSHP?						
11	Monitoring equipment properly maintained and calibrated?						
12	Employees notified of monitoring results?						
13	Chain of custody prepared and maintained for all samples?						
14	Weekly safety meeting held?						
15	Pre entry briefs held?						
16	Haz Com programs in place?						
17	Competent person evaluates excavation?						
18	Personnel responsible for work maintains control of area and general safety requirements are being followed? Note: fire extinguishers, eyewash, first aid kits and spill response equipment.						

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
19	Soil Excavation Maps prepared and updated?						
20	All personnel materials decontaminated prior to exiting contamination reduction zone?						
21	Decon stations properly established?						
22	Proper personal hygiene practices observed?						
23	Decon solutions collected and properly disposed of?						
24	At least one employee on each shift trained in CPR and first aid and BLOOD BORNE pathogens?						
25	First aid kit at each work site?						
26	All first aid and medical cases promptly reported to ToITest SSHO?						
27	List of emergency services/contact is up to date and posted?						
28	Assembly points identified and communicated to employees?						
29	Communication methods are adequate						
30	Records of all injuries and illnesses maintained by ToITest SSHO?						
31	Equipment operational checklists developed as needed?						
32	Two-way radios available per SSHP?						
33	Cellular telephone available as needed?						
34	Emergency alarms available?						
35	Drills and exercises conducted to test communication methods?						
36	Suitable quantities of spill supplies available?						
37	Operations arranged to minimize spills?						

Inspection Performed By: \_\_\_\_\_

Date: \_\_\_\_\_

Abatement Accepted By: \_\_\_\_\_

Date: \_\_\_\_\_

## **ATTACHMENT A**

### **Chemical Hygiene Plan**

**This Attachment must be modified according to the U.S. EPA hand written changes 2/25/98.**

**ATTACHMENT A**

**CHEMICAL HYGIENE PLAN (CHP)**

**FOR**

**ONSITE LABORATORY OPERATIONS**

## 1.0 CHEMICAL HYGIENE PLAN (CHP)

### 1.1 Introduction

The following Chemical Hygiene Plan (CHP) has been prepared for laboratory activities at the Bioremediation Facility Laboratory Trailer and is based on pertinent requirements established by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1910.1450 including Appendix A of the regulation. This CHP forms the basis of the chemical hygiene program used by TolTest personnel which sets forth procedures, equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in the Laboratory Trailer. This CHP is Appendix B to the Site Safety and Health Plan (SSHP) for Full Scale Soils Bioremediation Operations.

### 1.2 General Principles

In addition to the more detailed requirements listed in Section 1.5, the following general principles are established for all work in the laboratory setting on this project.

- A. It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals will be adopted, rather than specific guidelines for particular chemicals. Skin contact with chemicals should be avoided as a cardinal rule.
- B. Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic.
- C. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.

- D. Institute a chemical hygiene program as described in this CHP. A mandatory chemical hygiene program designed to minimize exposures will be utilized; it will be a regular, continuing effort, not merely a standby or short-term activity. Its requirements shall be followed by full-time Environmental Technicians and others serving as laboratory workers.
  
- E. Observe the Permissible Exposure Limits-Time Weighted Average (PEL-TWA), Threshold Limit Values-Time Weighted Average (TLV-TWA). The PELs-TWAs of OSHA and the TLVs-TWAs of the American Conference of Governmental Industrial Hygienists (ACGIH) should not be exceeded.

### 1.3 Chemical Hygiene Responsibilities

**1.3.1 Project Manager** - The Project Manager has ultimate responsibility for chemical hygiene within the laboratory and must, with other managers, provide continuing support for laboratory chemical hygiene.

**1.3.2 Environmental Specialist** - The Environmental Specialist serves as supervisor of the laboratory and is responsible for chemical hygiene. May serve as the Chemical Hygiene Officer (described below) and has the following responsibilities for chemical hygiene in the laboratory:

- (1) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided;
  
- (2) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment and spill control materials;
  
- (3) Know the current legal requirements concerning regulated substances;

- (4) Determine the required levels of protective apparel and equipment; and
- (5) Ensure that facilities and training for use of any material being ordered are adequate.

**1.3.3 Chemical Hygiene Officer (CHO)** - The Chemical Hygiene Officer (CHO) must be identified by the Project Manager and in this position is responsible for the following:

- (1) Work with managers and other employees to develop and implement appropriate chemical hygiene policies and practices
- (2) Monitor procurement, use, storage, and disposal of chemicals used in the lab;
- (3) Maintain audits of equipment and operations;
- (4) Help the Project Manager develop operating procedures for the laboratory facilities;
- (5) Know the current legal requirements concerning regulated Chemicals; and
- (6) Seek ways to improve the chemical hygiene program.

**1.3.4 Site Safety and Health Supervisor (Officer)** - The Site Safety and Health Supervisor (Officer) (SSHO) provides technical and administrative support as needed to the Chemical Hygiene Officer (CHO). The SSHO is responsible for conducting random inspections and surveillance of the laboratory to determine compliance with this CHP.

**1.3.5 Environmental Technicians** - The Environmental Technicians are responsible for:

- (1) Planning and conducting each operation in accordance with the laboratory chemical hygiene procedures;

- (2) Maintaining good personal chemical hygiene habits; and
- (3) Reviewing this CHP and providing recommendations for improvement to the CHO.

#### **1.4 Laboratory Facility**

The Lab Trailer is located adjacent to the Administration Trailers at the Bioremediation Facility. The Laboratory is approximately 30-ft by 20-ft in dimension. The Laboratory is equipped with an equalization damper adjacent to the door. The Laboratory consists of various cabinets and counter space, a Labconco Basic 47 fume hood (375 cfm), a sample drying oven, a sink and a sample refrigerator. The fume hood requires possible *tension adjustment and adjustment of vent draft plate.*

#### **1.5 General Procedures for Working with Chemicals**

##### **1.5.1 Chemical Procurement, Distribution and Storage**

- (1) Procurement. Before a substance is received, information on proper handling, storage, and disposal will be reviewed by the SSHO. Material Safety Data Sheets (MSDSs) will be managed per SSHP Section 4.4.
- (2) No container will be accepted without an adequate identifying label. Preferably, all substances should be received in a central location, that being the Laboratory Trailer.
- (3) Stockrooms/storerrooms. Toxic substances will be segregated in a well-identified area with local exhaust ventilation or in approved cabinets. Chemicals which are highly toxic or other chemicals whose containers have been opened will be in unbreakable secondary containers. Stored chemicals will be examined periodically (at least annually) for replacement, deterioration, and container integrity. Do not store heavy items above shoulder height. Use a stop stool for overhead access.

- (4) Distribution. When chemicals are hand carried, the container will be placed in an outside container or bucket. Solvents and acids should use container materials compatible with the material being transported.
- (5) Laboratory storage. Amounts permitted should be as small as practical. Storage on bench tops and in hoods is not permitted except in direct use containers. Exposure to heat or direct sunlight will be avoided. Periodic inventories will be conducted, with unneeded items being discarded or returned to the storeroom/stockroom and flammable storage cabinets.

**Note: Maximum storage of acetone in the Laboratory Trailer is 3-Gallons and the containers are to be stored in a flammable storage cabinet. Additional storage of acetone is limited to the capacities of the outside flammable storage cabinet.**

- (6) Flammables must never be stored with oxidizers.
- (7) If carcinogenic or teratogenic materials are in use or storage, warning signs must be displayed.

**1.5.2 General Rules for all Laboratory Work with Chemicals - The following will be used for essentially all laboratory work with chemicals:**

- (1) Accidents and spills-Eye Contact: Promptly flush eyes with water for a prolonged period (minimum of 15 minutes) and seek medical attention.

**Note: Contact lenses are not permitted when working with hazardous chemicals.**

**Ingestion:** Encourage the victim to drink large amounts of water. Read medical emergency instructions on MSDS. Seek medical attention. Do not induce vomiting unless instructed.

**Skin Contact:** Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.

**Clean-up:** Promptly clean up spills, using appropriate protective apparel and equipment (See MSDS for material).

- (2) Avoidance of "routine" exposure: Develop and encourage safe habits; avoid unnecessary exposure to chemicals by any route; Do not smell or taste chemicals. Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices. Do not allow release of toxic substances into rooms which have recirculated atmospheres. Avoid entrainment of exhaust into other work area air intakes.
- (3) Choice of chemicals: Use only those chemicals for which the design of the available ventilation system is appropriate for the material. Acids and flammables should not be discharged into unapproved ventilation systems.

**Note: Maximum quantity of Acetone for in process use within the ventilation hood is limited to 250 milliliters (mL).**

- (4) Avoid all eating, drinking, smoking, gum and tobacco chewing, or application of cosmetics in areas where laboratory chemicals are present; wash hands before conducting these activities. Avoid storage, handling or consumption of food or beverages in chemical storage areas. Do not use refrigerators, glassware or utensils which are also used for laboratory operations to handle or store food.

- (5) **Equipment and glassware:** Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus; use secondary containment. Use equipment only for its designed purpose.
- (6) **Exiting Laboratory:** Wash areas of exposed skin well before leaving the laboratory.
- (7) **Horseplay:** Avoid practical jokes or other behavior which might confuse, startle or distract another worker.
- (8) **Mouth suction:** Do not use mouth suction for pipetting or starting a siphon.
- (9) **Personal apparel:** Confine long hair and loose clothing. Wear work shoes or shoe covers at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers.
- (10) **Personal housekeeping:** Keep the work area clean and uncluttered. Chemicals and equipment should be properly labeled and stored. Clean up the work area on completion of an operation or at the end of each day.
- (11) **Personal protection:** Assure that appropriate eye protection is worn by all persons, including visitors, where chemicals are stored or handled. Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, wash them before removal where applicable, and replace them periodically. Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls. Inspect the respirator before each use. Use any other protective and emergency apparel and equipment as appropriate. Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special

precautions can be taken. Remove laboratory coats and/or aprons immediately on significant contamination. Use hot gloves or tongs to handle hot glassware or crucibles. Hot pods should be used to cool items.

- (12) Planning: Seek information and advice about hazards from the CHO and/or the SSHO, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation. Critical or hazardous operations require a Standard Operating Procedure (SOP).
  
- (13) Labconco Basic 47 Fume Hood: Use the hood for operations which might result in release of toxic and irritant chemical vapors or dust. As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm. Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made; keep materials stored in hoods to a minimum and do not allow them to block vents or air flow. Maximum quantity of Acetone for in process use within the ventilation hood is limited to 250 mL.

Note: "hood on" operation should be verified by visual indicator to worker outside the hood area.

- (14) ELE International Electric Drying Oven: do not place combustible, flammable or explosive material into the oven. Follow manufacturers recommendation for service checks including the operational check of the temperature limit switch.
  
- (15) Refrigerators used for the storage of potentially flammable materials must be approved for the hazard class.
  
- (16) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected.

- (17) **Waste disposal:** Assure that the plan for each laboratory operation includes plans and training for waste disposal. Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the CHP and the Quality Assurance Project Plan (QAPP).

Do not discharge to the sewer concentrated acids or bases; highly toxic, malodorous, or lachrymatory substances; or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow.

- (18) **Working alone:** Avoid working alone in the Lab Trailer; do not work alone in the Lab if the procedures being conducted are hazardous.

- (19) In the case of power failure, leave the lab trailer immediately. Open windows if possible.

**1.5.3 Environmental Monitoring and Sampling** - No environmental monitoring in the form of time integrated industrial hygiene monitoring and sampling has been determined to be necessary. The SSHO may complete monitoring and sampling to test ventilation systems or when new substances are stored or used regularly. The SSHO may require wipe sampling for explosive residues and metals to verify cleanliness of work surfaces.

#### **1.5.4 Housekeeping, Maintenance, and Inspection**

- (1) **Cleaning.** Excessive soil dust must be controlled at all times by wet wiping or mopping. Avoid dry sweeping of surfaces. Floors will be cleaned regularly by wet method. Use wipe mats at entrance to control soil tracking.
- (2) **Inspections.** Formal housekeeping and chemical hygiene inspections will be held at least semiannually; informal inspections will be continual. The

formal inspection will be conducted by the SSHO and documented using a memo to the CHO and file.

- (3) Maintenance. Eye wash fountains will be inspected at intervals of not less than 3 months and change out of self-contained units will occur per manufacturers recommendation. Respirators for routine use should be inspected periodically by the CHO. Other safety equipment should be inspected regularly.
- (4) Passageways. Access to exits, emergency equipment, and utility controls shall never be blocked. Shutoffs shall be clearly identified for emergency use. Fire extinguishers shall be wall mounted with identifying signs.
- (5) Ergonomic. Maintain adequate lighting for operations. Use antifatigue mats for extended standing operations.

#### **1.5.5 Medical Program**

- (1) Surveillance. Lab personnel will follow medical surveillance program requirements from Section 5 of the SSHP.

**1.5.6 Protective Apparel and Equipment** - The following items will be included for use in the Laboratory Trailer:

- (1) Protective apparel compatible with the required degree of protection for substances being handled. This includes safety glasses, chemical goggles, chemical resistant gloves, chemical resistant aprons, and face shields;
- (2) An easily accessible emergency eye-wash;
- (3) A fire extinguisher suitable for the level of hazard;

- (4) Easily accessible telephone or communication system for emergency use;  
and
- (5) Tools and material handling equipment as necessary for safe movement  
and transfer of chemical materials.

#### 1.5.7 Records

- (1) Accident records will be written and retained in accordance with the SSHP Section 11.2.
- (2) CHP records will document that the facilities and precautions were compatible with current knowledge and regulations as specified in the SSHP Section 13.3.
- (3) Medical records will be kept per SSHP Section 5.3.

**1.5.8 Signs and Labels** - Prominent signs and labels of the following types will be posted accordingly:

- (1) Emergency telephone numbers of emergency personnel/facilities and managers (*Table A-3 and Figure 1 from the SSHP*);
- (2) Identity labels, showing contents of containers (including waste receptacles) and associated hazards;

**Note: temporary use container including rinse water must have identity labels and name of user.**

- (3) Location signs for eyewash stations, other safety and first aid equipment, exits and areas where food and beverage consumption and storage are permitted; and

**ATTACHMENT B**

**Activity Hazard Analysis**

**ACTIVITY HAZARD ANALYSIS (AHA)**

Activity: Soil Excavation, Screening, Transport and Decontamination.		Analyzed By/Date: Travis C. Nowak 03/15/99	Reviewed By/Date: Scott Berndt 03/20/99
1.0 Principal Steps	Potential Hazards	Recommended Controls	
<p>1.1 Soil excavation, screening, transport and decontamination (general categories of work).</p> <p><b>PPE Required:</b> dedicated coveralls; 16 inch PVC boots; Tyvek; double nitrile gloves; dust mask; safety glasses. Note: dust mask use is determined by SSHO and is based on soil conditions and air monitoring results. Dust masks if required can be removed while operating equipment inside enclosed cabs provided clean storage and handling is maintained.</p>	<ol style="list-style-type: none"> <li>1. Struck by equipment or reject conveyor material while sorting and during start-up.</li> <li>2. Noise.</li> <li>3. Dust.</li> <li>4. Explosives contaminants.</li> <li>5. Eye/skin contact with high pressure wash.</li> <li>6. Slips do to wet surfaces.</li> <li>7. Heat/cold stress.</li> <li>8. Caught in moving parts.</li> <li>9. Severing an unidentified utility.</li> </ol>	<ol style="list-style-type: none"> <li>1. Keep clear of grizzly dump area during dumping. Ensure all personnel are clear prior to start-up. Ensure backup alarms working or use continuous spotter: <ul style="list-style-type: none"> <li>- operator physically acknowledges presence of other personnel and equipment during operation.</li> <li>- personnel keep clear of equipment operational path.</li> <li>- use handtools to sort through reject material.</li> </ul> </li> <li>2. Hearing protection required outside cab within 15 feet of operating equipment.</li> <li>3. Dust suppression immediately available. Use based on monitoring and visual inspection. Safety glasses and dust mask required.</li> <li>4. Work area demarcated, PPE as listed above; decontamination of all equipment/material and personnel.</li> <li>5. Rainsuit, faceshield, heavy nitrile gloves required for use of high pressure wash.</li> <li>6. Provide adequate drainage without excessive slope.</li> <li>7. PPE/Breaks/Fluids provided based on SSHO guidance.</li> <li>8. Ensure all guards are in place prior to operation. Keep clear of all moving parts. Lockout/tagout of equipment prior to any access/maintenance of moving parts.</li> <li>9. Excavation permit required; all utilities identified and marked; hand dig within 2 feet of utility.</li> </ol>	
1.2 Equipment to be Used	Inspection Requirements	Training Requirements	
1.3 Heavy equipment for excavation and hauling. Screener and hand tools.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory, 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre-Entry Briefs, and OSHA Hazard Communication.	

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Receive Mix and Load Building with Amendments to Soil.	Analyzed By/Date: Travis C. Nowak 03/15/99	Reviewed By/Date: Scott Berndt 03/20/99
2.0. Principal Steps	Potential Hazards	Recommended Controls
<p>2.1. Receive Mix and Load Building with Amendments to Soil (general categories of work)</p> <p><b>PPE Required:</b> dedicated coveralls; 16 inch PVC boots; Tyvek; double nitrile gloves; dust mask; safety glasses. Dust Mask unless ammonia monitoring results indicate F.F. APR w/HEPA/NH<sub>3</sub> cartridge necessary. Note: dust mask can be removed while operating equipment inside enclosed cabs provided clean storage and handling is maintained.</p>	<p>1. Struck by equipment.</p> <p>2. Noise.</p> <p>3. Dust/Ammonia. Biological by direct contact.</p> <p>4. Heat/Cold Stress.</p> <p>5. Caught in Moving Parts.</p>	<p>1. Ensure backup alarms are working or continuous spotter provided:  - operator physically acknowledges presence of other personnel and equipment during operation.  - personnel keep clear of equipment operational path.  - use handtools to sort through reject material.</p> <p>2. Hearing protection required outside of cab within 15 feet of equipment.</p> <p>3. Dust suppression immediately available. Use based on monitoring and visual inspection. Safety glasses and dust mask required unless ammonia monitoring dictates F.F. APR w/HEPA/NH<sub>3</sub> cartridges.</p> <p>4. PPE/Breaks/Fluids provided based on SSHA guidance.</p> <p>5. Ensure all guards are in place prior to operation. Keep clear of all moving parts. Lockout/tagout of equipment prior to any access/maintenance of moving parts.</p>
2.2 Equipment to be Used	Inspection Requirements	Training Requirements
2.3. Grinder, heavy equipment for material handling.	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- Entry Briefs, and OSHA Hazard Communication.

<b>ACTIVITY HAZARD ANALYSIS (AHA)</b>		
Activity: Turning, Sampling and Water Addition to Compost Piles.	Analyzed By/Date: Travis C. Nowak 03/15/99	Reviewed By/Date: Scott Berndt 03/20/99
<b>3.0. Principal Steps</b>	<b>Potential Hazards</b>	<b>Recommended Controls</b>
<p>3.1. Turning, Sampling and Water Addition to Compost Piles (general categories of work).</p> <p><b>PPE Required:</b> dedicated coveralls; 16 inch PVC boots; Tyvek; double nitrile gloves; dust mask; safety glasses. Dust Mask unless ammonia monitoring results indicate F.F. APR w/HEPA/NH<sub>3</sub> cartridge necessary. Note: dust mask can be removed while operating equipment inside enclosed cabs provided clean storage and handling is maintained.</p>	<ol style="list-style-type: none"> <li>1. Struck by equipment.</li> <li>2. Struck by flying debris from Scarab.</li> <li>3. Noise</li> <li>4. Explosives contamination.</li> <li>5. Dust/ammonia.</li> <li>6. Heat/Cold Stress</li> <li>7. Caught in moving parts.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure backup alarms are working or continuous spotter provided: <ul style="list-style-type: none"> <li>- operator physically acknowledges presence of other personnel and equipment during operation.</li> <li>- personnel keep clear of equipment operational path.</li> </ul> </li> <li>2. No personnel allowed in building during turning unless protected by equipment cab.</li> <li>3. Hearing protection required outside cab within 15 feet of equipment.</li> <li>4. Work area demarcated, PPE levels established and decontamination.</li> <li>5. Dust suppression immediately available. Use based on monitoring and visual inspection. Safety glasses and dust mask required unless ammonia monitoring dictates F.F. APR w/HEPA/NH<sub>3</sub> cartridges.</li> <li>6. PPE/Breaks/Fluids provided based on SSHO guidance.</li> <li>7. Ensure all guards are in place prior to operation. Keep clear of all moving parts. Lockout/tagout of equipment prior to any access/maintenance of moving parts.</li> </ol>
<b>3.3 Equipment to be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
3.4. Scarab, skid loader, sampling and monitoring equipment.	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- Entry Briefs, and OSHA Hazard Communication.

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Compost Removal from Buildings.	Analyzed By/Date: Travis C. Nowak 03/15/99	Reviewed By/Date: Scott Berndt 03/20/99
4.0 Principal Steps	Potential Hazards	Recommended Controls
4.1 Compost removal from buildings.  PPE required: Dedicated coveralls, 16 inch PVC Boots, and Safety Glasses.	1. Struck by moving equipment.  2. Noise. 3. Heat/Cold Stress. 4. Caught in moving parts.	1. Ensure backup alarms are working or continuous spotter provided: - operator physically acknowledges presence of other personnel and equipment during operation. - personnel keep clear of equipment operational path. 2. Hearing protection required outside cab within 15 feet of equipment. 3. PPE/Breaks/Fluids provided based on SSHO guidance. 4. Ensure all guards are in place prior to operation. Keep clear of all moving parts. Lockout/tagout of equipment prior to any access/maintenance of moving parts.
4.2 Equipment to be Used	Inspection Requirements	Training Requirements
4.3 Heavy equipment.	Daily, prior to use per manufacturer's recommendation in accordance with Operational Plan.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre-Entry Briefs, and OSHA Hazard Communication.

<b>ACTIVITY HAZARD ANALYSIS (AHA)</b>		
Activity: Pond/Sump Dewatering.	Analyzed By/Date: Travis C. Nowak 03/15/99	Reviewed By/Date: Scott Berndt 03/20/99
<b>5.0 Principal Steps</b>	<b>Potential Hazards</b>	<b>Recommended Controls</b>
<b>5.1 Pond/Sump Dewatering.</b>  <b>PPE required:</b> Nitrile gloves if outside exclusion zone; dedicated coveralls; 16 PVC boots; single nitrile gloves and safety glasses as a minimum.	1. Water hazards (drowning).  2. Fire during refueling operations.  3. Leaks or spills of water.	1. Buddy system required inside locked impound area. Life jackets required when inside impound area.  2. Use only flash arrested approved safety can. Fuel gasoline powered pumps with engine off and cool to touch.  3. Inspect all hoses and connections prior to use and periodically thereafter.
<b>5.2 Equipment to be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
<b>5.3</b> Portable pumps and holding tanks, handtools.	Daily, prior to use per manufacturer's recommendation in accordance with Operational Plan.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre-Entry Briefs, and OSHA Hazard Communication.

**ATTACHMENT C**

**Field Standard Operating Procedure Sshp-01**

**Appendix A3 will be issued for approval as an addendum to this Operations Plan  
prior to beginning excavation at SWMU 10/15, Rockeye**

## **APPENDIX A3**

### **SWMU-10/15, Rockeye Site Specific Safety and Health Plan (SSHP) for Full-Scale Operations**