REVISED FINAL
ACCIDENT PREVENTION PLAN FOR SITE INSPECTION AT COMPLIANCE RESTORATION SITE CC RVAAP-80 GROUP 2 PROPELLANT CAN TOPS

Former Ravenna Army Ammunition Plant,

Portage and Trumble Counties, Ohio

January 7, 2016

Contract No. W912QR-12-F-0212

Prepared For

U.S. Army Corps of Engineers, Louisville
600 Dr. Martin Luther King, Jr. Place
Louisville, KY 40202

Prepared By

PIKA International, Inc.
12723 Capricorn Drive, Suite 500
Stafford, TX 77477

REPORT DOCUMENTATION PAGE

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Former Ravenna Army Ammunition Plant (RVAAP) Ravenna, Ohio

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W912QR-12-F-0212

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5c. PROGRAM ELEMENT NUMBER
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6. AUTHOR(S)

Richard Callahan, PIKA Project Manager

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Reference Distribution Page

13. SUPPLEMENTARY NOTES

None

14. ABSTRACT

This Accident Prevention Plan has been developed for the U.S. Army Corps of Engineers, Louisville to support the on-site operations for the Site Inspection at the Compliance Restoration Site CC RVAAP-80 Site at the Former Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio.

15. SUBJECT TERMS

Accident Prevention Plan

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a. REPORT	b. ABSTRACT	c. THIS PAGE			Richard Callahan
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Reset

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

February 22, 2016

Mr. Mark Leeper
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage
267000859160

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the "Revised Final Project Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops," Dated January 7, 2016. Ohio EPA ID # 267-000859-160

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Revised Final Project Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on January 8, 2016. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by PIKA International, Inc. under Contract Number W912QR-12-F-0212.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b). Ohio EPA considers the document final and approved.

Ohio EPA also received the "Revised Final Accident Prevention Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops" on January 8, 2016 and acknowledges receipt of this document. Ohio EPA does not approve Accident Prevention Plans.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvr

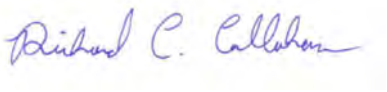
cc: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Gregory F. Moore, USACE
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Justin Burke, Ohio EPA, CO, DERR

STATEMENT OF INDEPENDENT TECHNICAL REVIEW

PIKA International, Inc. (PIKA) has completed the Revised Final Accident Prevention Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops at the Ravenna Army Ammunition Plant. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy, principles and procedures, utilizing justified and valid assumptions, was verified. This included review of technical assumptions; methods, procedures and materials to be used; and whether the product meets customer's needs consistent with law and existing U.S. Army Corps of Engineers policy.

Reviewed/Approved by: _____ Date: 01/07/16
Sarosh Manekshae, Certified Safety Professional (CSP)
PIKA Corporate Safety and Health Manager



Reviewed/Approved by: _____ Date: 01/07/16
Richard Callahan
PIKA Project Manager

Reviewed/Approved by: _____ Date: 01/07/16
Shahrukh Kanga
PIKA Principal

REVISED FINAL
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DOCUMENT DISTRIBUTION

Name/Organization	Hard Copies	Electronic Copies
ARNGD	0	1
OHARNG/Camp Ravenna	1	1
Ohio EPA/NEDO/DERR	3	3
PIKA Program Manager	1	1
PIKA Project Manager	2	2
REIMS	0	1
RVAAP Facility Manager	2	2
USACE Project Manager - Louisville	2	2

ARNGD – Army National Guard Directorate

OHARNG – Ohio Army National Guard

Ohio EPA/NEDO/DERR – Ohio Environmental Protection Agency Northeast District Office Division of Environmental Response and Revitalization

PIKA – PIKA International Inc.

REIMS – Ravenna Environmental Information Management System

RVAAP – Ravenna Army Ammunition Plant

USACE – United States Army Corps of Engineers – Louisville District

ACCIDENT PREVENTION PLAN SIGNATURE SHEET

Project: Site Inspection – Compliance Restoration Site CC RVAAP-80 (Group 2 Propellant Can Tops Area).

Site, Location: Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio

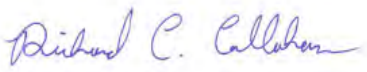
The PIKA International, Inc. (PIKA) personnel referenced below have reviewed and approved this Accident Prevention Plan (APP) for implementation for the above referenced work. Procedures for the submission, approval, integration and implementation of changes to this APP are discussed within the body of the APP and will be followed whenever a change will significantly affect the safety of site personnel, the environment or off-site personnel.

Prepared by:

_____ Date:12/22/15

Sarosh Manekshaw, Certified Safety Professional (CSP)
PIKA Corporate Safety and Health Manager

Plan Concurrence by:



_____ Date: 12/22/15

Richard Callahan
PIKA Project Manager

Approval by:

_____ Date: 12/22/15

Shahrukh Kanga
PIKA Principal

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APPENDICES

LIST OF ACRONYMS

AHA	activity hazard analysis
APP	Accident Prevention Plan
CELRL	United States Corps of Engineers, Louisville District
CESHM	Corporate Environmental, Safety, and Health Manager
CESHP	Corporate Environmental, Safety, and Health Program
CFR	Code of Federal Regulations
CR	Compliance Restoration
CSP	Certified Safety Professional
DID	Data Item Description
EM	Engineering Manual
EMR	experience modification rating
ES&H	environmental, safety, and health
HAZCOM	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTRW	Hazardous Toxic Radioactive Waste
IAW	in accordance with
JSA	job safety analysis
LL	load lines
LWDR	lost work day rate
OHARNG	Ohio Army National Guard
OSHA	Occupational Safety and Health Administration
PIKA	PIKA International, Inc.
PM	Project Manager
PPE	personal protective equipment
PWS	Performance Work Statement
RRD	Range Related Debris
RVAAP	Ravenna Army Ammunition Plant
S&H	safety and health
SS	Site Supervisor
SSHP	Site Safety Health Plan
SOP	standard operating procedure

Compliance Restoration Site CC RVAAP-80

1	USACE	United States Army Corps of Engineers
2	SUXOS	Senior UXO Supervisor
3	UXOSO	UXO Safety Officer
4	WP	Work Plan

1.0 BACKGROUND INFORMATION

1.1 PLAN INTRODUCTION AND INTEGRATION

This Accident Prevention Plan (APP) and the attached Site Safety and Health Plan (SSHP) have been developed for the U.S. Army Corps of Engineers (USACE), Louisville District (CELRL), to support site inspection operations at Compliance Restoration Site CC RVAAP-80 at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. This APP has been developed using the minimum basic outline provided in Appendix A of the USACE Engineering Manual (EM) 385-1-1, Safety and Health Requirements Manual, dated 15 September 2008. The USACE EM 385-1-1 manual and the Occupational Safety and Health Administration (OSHA) regulations will be the primary regulatory documents under which all operations will be conducted.

The APP and SSHP have been developed in accordance with (IAW) the U.S. Army Engineering and Support Center, Huntsville, Data Item Description (DID) MR-005-06 to tier under and supplement the RVAAP Facility-Wide Health and Safety Plan (USACE 2011). As stated in DID MR-005-06, the APP is to be an implementing document that emphasizes "who" will have specific environmental, safety, and health (ES&H) responsibilities and "how" and "when" they will be applied to the project. As such, this APP will act as the PIKA International, Inc. (PIKA) overall ES&H document for this project and will be used to present programmatic data related to the project execution.

The EM 385-1-1 APP outline specifies that a SSHP be developed as a sub-plan of the APP for sites where the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard is applied. Therefore, an SSHP has been developed for this project and is presented in Attachment 1 of this APP. As mandated by OSHA, the intent of an SSHP is to disseminate site- and task-specific hazard information and hazard control/mitigation procedures to on-site personnel. Therefore, where outline requirements for the APP and the SSHP cause duplication in data presentation, PIKA has chosen to present the bulk of the site-specific data in

the SSHP. Transfer of data from the APP to the SSHP is noted as applicable in this APP.

1.2 CONTRACTOR

The contractor for the performance of this project is PIKA. PIKA will be responsible for the management of all resources required for the successful completion of objectives listed in the Performance Work Statement (PWS).

1.3 CONTRACT NUMBER

The contract number for this project is W912QR-12-F-0212.

1.4 PROJECT NAME

The name of this project is CC RVAAP-80 (Group 2 Propellant Can Tops Area) at Ravenna Army Ammunition Plant, Ravenna, Ohio.

1.5 BRIEF PROJECT DESCRIPTION

CC RVAAP-80 consists of the Group 2 Propellant Can Tops area. Propellant cans and tops were identified on the ground surface/near surface at the southern end of the former Group 2 Ammunition Storage Area. Shipping containers/caps are not munitions rather the means used to transport the propellant to the appropriate firing point. Currently shipping containers and packing materials are classified as material potentially presenting an explosive hazard (MPPEH) until inspection and verification that propellant has been removed. Upon completion of this inspection process the items would be immediately reclassified as material documented as safe (MDAS) and as such able to be released to the public. All cans and tops recovered to date at Former Ravenna Army Ammunition Plant (RVAAP) have been classified as MDAS.

The propellant can tops located at the south end of Group 2 were initially identified by Ohio Army National Guard (OHARNG) trainees in the winter of 2008. The propellant can tops were observed in the vegetative area located immediately south of the ammunition storage magazines in the vicinity of the southern railroad spur lines. This area consists of approximately 539,572 square ft (12.4 acres).

The Louisville District USACE performed an emergency survey with a metal detector of a portion of the southern area ground surface. Results of the initial investigation revealed multiple magnetic anomalies in the surface and near surface soils. On-site personnel visually identified the surface anomalies as propellants can lids or tops. During the emergency survey it was noted that the ground surface had been disturbed and contained hummocks (mounds) ranging in height form 1' to 2' throughout the survey area. The historic aerial photos showed storage materiel on pallets in this area. The area appeared to not have been gravel covered, so the hummocks were likely caused by the tires of the vehicles used to place or retrieve the pallets sinking in when the ground was soft.

In April through May of 2011 an investigation was initiated to conduct a geophysical survey of the 12.4 acres, and collect three surficial incremental soil samples. The geophysics utilized an EM-61MK2, which showed five clusters of steel at or near the surface, as well as other scattered steel. The geophysics proved that there had not been any burial of the lids. Three of the clusters became the location of the three multi-increment samples collected during the investigation.

The soil samples were analyzed for target analyte list (TAL) metals, and common propellants used by the Department of Defense (DoD) including nitrocellulose, nitroglycerine, nitroguanidine, and perchlorate. One (1) of the three samples was also analyzed for the RVAAP full suite, (including explosives, cyanide, volatile organic compounds; VOCs, semi-volatile organic compounds; SVOCs, and poly chlorinated bi-phenyls; PCBs). The three samples did not reveal any analytes exceeding the facility-wide cleanup goals (FWCUGs). The data obtained through this site inspection will be used to determine the need for a Remedial Investigation or support project closeout in the SI phase.

1.5.1 Description of Work to be Performed

The on-site activities necessary to meet the goals of the PWS will include the following (site activity specifics can be found in the project Work Plan (WP) :

- Mobilization, site setup, demobilization;

- Conduct site preparation to include vegetation removal.
- Identify, collect, certify as safe and dispose of the propellant tops and cans associated the anomalies identified during the previous site investigation.
- Collect ISM five (5) surface and three (3) subsurface soil samples within the areas of the referenced anomalies.
- Perform sample analysis for the common propellants used by DoD including nitrocellulose, nitroglycerine, nitroguanidine, and perchlorate.
- Analysis and disposal of IDW.
- Manage and validate data IAW EPA Contract Laboratory Program (CLP) Level IV data validation to meet the requirements of DoD Quality Systems Manual (QSM).
- Survey and map the site.

1.5.2 Location

When the RVAAP IRP began in 1989, the RVAAP was identified as a 21,419 acre installation. The property boundary was resurveyed by the OHARNG over a two year period (2002 and 2003) and the actual total acreage of the property was found to be 21,683 acres. As of September 2013, all 21,683 acres of the former RVAAP have been transferred to the USP&FO for Ohio for use by OHARNG as a military training site, now called Camp Ravenna.

Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east northeast of the City of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the City of Newton Falls. Camp Ravenna is a parcel of property approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east. Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 9.6 kilometers (6 miles) to the northwest; Newton Falls, 1.6 kilometers (1 mile) to the southeast; Charlestown to the southwest; and Wayland, 4.8 kilometers (3 miles) to the south.

When RVAAP was operational, Camp Ravenna did not exist, and the entire 21,683-acre parcel was a government-owned contractor-operated industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP; references to the RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, unless otherwise specifically stated.

1.6 HISTORY

Production at the facility began in December 1941, with the primary missions of depot storage and ammunition loading. The installation was divided into two separate units - the Portage Ordnance Depot and the Ravenna Ordnance Plant. The Portage Ordnance Depot's primary mission was storage of munitions and components; while the mission of the Ravenna Ordnance Plant was loading and packing major caliber artillery ammunition and the assembly of munitions initiating components that included fuzes, boosters, and percussion elements. In August 1943, the installation was redesignated the Ravenna Ordnance Center and again, in November 1945, as the Ravenna Arsenal. The plant was placed in standby status in 1950; and operations were limited to renovation, demilitarization, and normal maintenance of equipment, along with storage of ammunition and components.

The plant was reactivated during the Korean Conflict to load and pack major-caliber shells and components. All production ended in August 1957; and in October 1957, the installation was again placed in a standby condition. In October 1960, the ammonium nitrate line was renovated for demilitarization operations, which involved melting explosives out of bomb casings for subsequent recycling. These operations commenced in January 1961. In July 1961, the plant was again deactivated. In November 1961, the installation was divided into the Ravenna Ordnance Plant and an industrial section, with the entire installation then being designated as the RVAAP.

In May 1968, RVAAP began loading, assembling, and packing munitions on three load lines (LLs) and two component lines in support of the Southeast Asia Conflict. These facilities were deactivated in August 1972. The demilitarization of the M71A1

90-millimeter projectile extended from June 1973 until March 1974. Demilitarization of various munitions was conducted from October 1982 through 1992.

Until 1993, RVAAP maintained the capability to load, assemble, and pack military ammunition. As part of the RVAAP mission, the inactive facilities were maintained in a standby status by keeping equipment in a condition to permit resumption of production within prescribed limitations. In September 1993, the RVAAP was placed in inactive caretaker status and subsequently changed to modified caretaker status. The LLs and associated real estate were determined to be excess by the Army.

As of September 2013, all 21,683 acres of the former RVAAP have been transferred to the USP&FO for Ohio for use by OHARNG as a military training site, now called Camp Ravenna.

1.7 PHASES OF WORK REQUIRING ACTIVITY HAZARDS ANALYSES

During the course of work, PIKA personnel will be involved with activities that will potentially expose them to chemical, physical, and biological hazards that will be controlled through the use of engineering, administrative, and personal protective equipment (PPE) controls. Additionally, because operations conducted during this project are governed by the OSHA hazardous waste standard in 29 CFR 1910.120 and 1926.65, PIKA is required to develop an SSHP for this project (see Attachment 1 to this APP). During the SSHP development, PIKA will conduct an activity hazard analysis (AHA) of the tasks outlined below. Additional information on the activity hazard analyses can be found in Section 3.0 of the SSHP and the AHA forms are located in Attachment 2 of this APP. The phases of work for which an AHA will be developed include:

- Mobilization, site setup, demobilization;
- Vegetation removal;
- Surface and Near-surface MPPEH Clearance of the Propellant Cans and Tops;
- Collect surface and subsurface soil samples using a Geoprobe; and

- MPPEH Inspection, Certify MDAS and Disposal.

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

2.1 SAFETY AND HEALTH POLICY STATEMENT

The fundamental safety and health (S&H) policy of PIKA is to provide PIKA employees with a safe and healthful working environment that is free of recognized safety or health hazards. Paramount to the implementation of this policy is PIKA's core safety belief that accidents are preventable and that the safety of the worker, the environment, or the public will never be compromised to promote other project objectives such as production, cost or schedule.

A copy of PIKA's Corporate Statement of Safety and Health Policy is provided as Attachment 7.

2.2 PIKA'S WRITTEN SAFETY PROGRAM GOALS, OBJECTIVES AND ACCIDENT CONTROL PROGRAMS/MANAGEMENT

2.2.1 Written Corporate Environmental, Safety and Health Program (CESHP) Goals

The goal of PIKA's comprehensive written CESHP is to outline the management structure and safety integration procedures PIKA uses to assist in the transfer of ES&H values from the corporate environment to field operations. Safety policies do not benefit the company, the worker, or the client if there is no vehicle present to translate the policy statements into actions that positively affect the personnel, environment, and client associated with each project. To facilitate this, the PIKA CESHP contains the hazard control and management programs required by OSHA, USACE, and other agency and client-specific regulations. Additionally, the PIKA ES&H standard operating procedures (SOPs), and ES&H forms are attached to the program as appendices for use by field personnel. The ESHPs and forms relevant to this project are presented in Attachments 3 and 4, respectively.

2.2.2 CESHP Objectives

2.2.2.1 Management Objective

For PIKA to effectively implement its ES&H policies, it is imperative that the PIKA CESHP include information relevant to the incorporation of ES&H values into levels of project performance. Therefore, one of the primary objectives of this CESHP is to provide management and project personnel with practical information related to the anticipation, recognition, evaluation, and mitigation of ES&H issues that may adversely affect on-site personnel, the environment, or the public. As such, this CESHP contains information related to:

1. The ES&H chain of command and the responsibilities of corporate and on-site ES&H personnel;
2. The procedures used to integrate ES&H during the planning and implementation of projects;
3. The anticipated hazards to which personnel may be exposed, including information that will be used to recognize and assess the anticipated hazards;
4. The control procedures and safe work practices personnel will use to reduce and, when possible, eliminate, the hazards and/or the risk of exposure; and
5. The identification and evaluation of potential effects on the environment and the measures to manage, control, and mitigate those impacts.

2.2.2.2 Regulatory Compliance Objective

An additional objective of this CESHP is to achieve PIKA's compliance with the applicable requirements outlined in regulatory references applicable to PIKA's work, specifically, the HAZWOPER requirements presented in Title 29 of the Code of Federal Regulations (CFR) Part 1910.120 and Section 28 of USACE EM 385-1-1. As specified in these standards, PIKA is required to develop and implement a safety and health program to govern work at HAZWOPER sites. The PIKA CESHP, with its attached SOPs, provides PIKA with the compliance tools needed to meet the regulatory requirements of 29 CFR 1910.120(b), and EM 385-1-1 paragraph 01.A.02.

2.2.3 Accident Experience Goals for This Contract

As with every contract, PIKA's goal will be to perform this contract without an USACE or OSHA recordable accident. PIKA's past lost work day rate (LWDR) and experience modification rate (EMR) for the past three years are presented in Table 1.1.

Table 2-1: PIKA's Accident Statistics

Year	LWDR	EMR
2012	0	0.07
2013	0.817	0.87
2014	0	0.96

3.0 RESPONSIBILITIES AND LINES OF AUTHORITIES

3.1 PIKA'S RESPONSIBILITY STATEMENT FOR S&H IMPLEMENTATION

The PIKA CESHP specifies that all the PIKA personnel are responsible for their safety and the safety of the personnel working with them. However, it is also stated that the ultimate S&H responsibility begins with the Principal of PIKA; and this responsibility radiates outward to all management, administrative, operations, and field personnel. To achieve this philosophy, PIKA empowers all personnel with stop-work authority regarding known or potential S&H issues. Additionally, all PIKA personnel are held accountable for performing their assigned tasks in a manner that promotes continuous, active hazard evaluation and safe task performance.

3.2 IDENTIFICATION/ACCOUNTABILITY OF PERSONNEL RESPONSIBLE FOR SAFETY

The key personnel at PIKA that are responsible for safe project performance include:

- The President of PIKA;
- PIKA's Corporate Environmental Safety and Health Manager (CESHM);
- The Project Manager (PM);
- The project Site Supervisor (SS);
- The Unexploded Ordnance Safety Officer (UXOSO); and
- Field personnel.

The ES&H responsibilities of the personnel filling the roles listed above are presented in detail in Section 4.0 of the SSHP in Attachment 1 of this APP. Because this on-site safety management structure is specific for this type of work, PIKA has chosen to present the personnel responsible for safety in Section 4.0 of the SSHP.

3.3 COMPETENT AND/OR QUALIFIED PERSONS

IAW the definitions published by OSHA in 29 CFR 1926.32 and the definitions published by the USACE in Appendix Q of EM 385-1-1, the terms Competent Person and Qualified Person have very specific meanings and are used by OSHA and the USACE to specify the level of training, experience, certification, and competency required by on-site personnel involved with specific tasks. As applicable to, and necessary for, the performance of a specific task specified in the PWS, PIKA will designate the name and position of the competent/qualified person(s) required for each task presented in the AHA forms developed IAW 01.A.13 of USACE EM 385-1-1 for each task or group of similar tasks in the PWS. The personnel listed below are subject to change; however, personnel filling these positions will have comparable training experience and knowledge.

The competent persons for this project are:

1. Margaret Carte, PG (Site Supervisor), and
2. Cameron Wenzel (Unexploded Ordnance Safety Officer).

The qualified persons for this project are:

1. Richard Callahan (Project Manager),
2. Margaret Carte, PG (Site Supervisor),
3. Sarosh Manekshaw, CSP (Safety Manager), and
4. Cameron Wenzel (Unexploded Ordnance Safety Officer)

3.4 ON-SITE COMPETENT PERSON REQUIREMENTS.

At no time will operations be conducted without the on-site presence of the designated competent person, nor will any task be performed that requires a qualified person without the presence or written approval of the qualified person.

3.5 PRE-TASK SAFETY AND HEALTH ANALYSIS

PIKA will review all definable phases of work, develop an AHA, and submit the analysis for approval. Multiple tasks may be addressed and listed under a single AHA if the hazards and control methods employed to safeguard personnel are similar for all the tasks listed on the AHA. Before the initiation of a specific task, a task hazard

briefing will be provided by the SSHO to inform task personnel of the hazards and methods of hazard control associated with the given task. The UXOSO will be responsible for documenting the task hazard briefing and all personnel present for the briefing will sign the documentation of training form for the specific AHA.

PIKA will incorporate a streamlined job safety analysis (JSA) for specific subtasks having relatively moderate to high risks. The JSA is an OSHA-supported platform for capturing additional site and situation-specific hazards with associated controls. The JSA facilitates an ongoing operational risk assessment.

This additional scrutiny assures ample opportunity for the speedy recognition and control of newly introduced hazards brought on by changing site conditions.
Together, the SS and UXOSO will identify subtasks requiring the need for a JSA; the JSA is intended to augment the AHA, not to be used in lieu of. Form-536, Job Safety Analysis, can be found with the ES&H forms (Attachment-4).

3.6 LINES OF AUTHORITY

As a part of its corporate structure, PIKA has developed a system whereby the lines of authority for personnel responsible for production and on-site ES&H are separate. All issues related to on-site operations regarding production and resources are handled initially on-site by the SS, who reports to the PM. Issues that cannot be handled by the PM are delegated to the Principal of PIKA. While S&H is the responsibility of all personnel, the UXOSO is the on-site representative of the PIKA CESHM. As such, the UXOSO is responsible for ensuring overall compliance by site personnel with the APP; to maintain autonomy, the UXOSO reports directly and is accountable to the CESHM for S&H issues.

3.7 POLICIES AND PROCEDURES REGARDING NONCOMPLIANCE

3.7.1 General Requirements

These corporate-level procedures and as such are presented here in the APP rather than in the SSHP, which is more site-specific. An essential element of safe work performance is the realization by site personnel that their compliance with

established safety and health procedures is of paramount importance in the prevention of accidents and emergencies that could compromise their safety, health, and the well-being of other site personnel, the environment, and the public. Because violations of the safety and health procedures and programs outlined in this APP can result in serious personal injury, illness, death, or environmental insult, personnel violating the safety or health requirements of this APP may be subject to disciplinary action.

3.7.2 Safety and Health Violations

It is the general policy of PIKA that no personnel engage in any activity for which: (1) they are not properly trained; (2) the consequences of the activity are uncertain; or (3) the activity hazards have not been assessed. As deemed necessary, the SS or UXOSO may impose other prohibitions to ensure the safe conduct of operations. The prohibitions presented below are strictly forbidden at any time, during any on-site operation, with the violation of these rules possibly resulting in termination of employment.

- Horseplay or fighting;
- Use of alcohol on site;
- Illegal use of drugs at all times either on or off the work site;
- Use of prescription or over-the-counter medications without SS approval;
- Eating, drinking, or smoking in a work zone without prior approval;
- Starting/maintaining an open flame of any type unless authorized by the SS IAW the allowable provisions of the WP and this APP;
- Using equipment that has not been inspected and deemed safe for operation;
- Entry into a work site without prior approval of the SS; and
- Failure to report an incident that results in personal injury or property damage.

3.7.3 Disciplinary Actions

If a nonconformance occurs, appropriate positive disciplinary action will be taken. In all cases where a potential violation has been reported, the SS and UXOSO will

conduct an investigation to validate the report and to determine the severity of the violation. Violations will be divided into two categories: major and minor. An example of a minor violation is reporting to work without the prescribed PPE. A major violation is any violation of the APP that could have resulted, or did result, in an accident involving personal injury or property damage. Table 3-1 outlines the disciplinary actions and procedures to be followed if a noncompliance issue results from personnel actions.

TABLE 3-1: DISCIPLINARY ACTIONS FOR MINOR AND MAJOR VIOLATIONS

MINOR VIOLATION ISSUES	
First Offense:	A verbal warning will be given to the individual; the offense to be noted in individual's file and supervisor's project file; a discussion with the individual's supervisor will be conducted.
Second Offense:	Written reprimand by the SS will be entered in individual's file; discussion with individual and individual's supervisor.
Third Offense:	Potential termination of employment as determined by the PIKA Principal.
MAJOR VIOLATION ISSUES	
Any Offense:	Minimum penalty for a major violation will consist of a written reprimand being entered in individual's file and a discussion between the individual and the SS being conducted. Depending upon the severity of the violation, the SS may temporarily dismiss the individual from the job site pending further investigation of the offense. Major violations must be immediately reported to the PM and CESHM by the SS. Upon completion of a full investigation, the individual's employment may be terminated, if deemed appropriate by the PIKA Principal.

3.8 MANAGER AND SUPERVISOR ACCOUNTABILITY FOR SAFETY

PIKA compiles a matrix of S&H incidents on a per-site basis as part of its accident prevention and lessons learned programs. The matrix is compiled from data provided on the PIKA accident/incident forms submitted by the UXOSO upon completion of each incident investigation. This matrix is reviewed by the CESHM to determine accident trends pertaining to sites, supervisors, and project managers. Trends identified are reported to the PIKA Principal on at least a quarterly basis. Supervisors and PMs identified as having adverse trends will be counseled by the PIKA Principal; negative trend reports may negatively affect financial gain and future employment of the associated Supervisor or PM.

Supervisors and PMs will be counseled and involved in resolution when an incident happens on their site to quickly assess and learn from the incident.

4.0 SUBCONTRACTORS AND SUPPLIERS

Control of subcontractors and suppliers will be maintained by PIKA's site control plan as implemented by the SS. Suppliers and subcontractors wishing to gain access to the site will be required to notify the SS of their arrival and sign in with the SS. The SS will then be responsible for ensuring that deliveries are made and equipment is properly stored and secured. The SS will also ensure that all subcontractors are properly informed, trained, and have read and understood the SSHP.

4.1 SUBCONTRACTORS AND SUPPLIERS

PIKA will use several local and out-of-area subcontractors and suppliers for the following tasks:

- Brush clearing;
- Licensed Driller (Geoprobe activities);
- Sample analysis; and
- Acquisition of equipment, rental cars, fuel, and miscellaneous supplies.

4.2 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

PIKA's subcontractor agreement and purchase order system binds subcontractors to conduct their operations IAW PIKA's site plans and applicable federal, state and local ES&H requirements. The SS, in consultation with the PM, UXOSO, and CESHM, will enforce these requirements. All subcontractors and suppliers will be responsible for providing adequately trained and experienced personnel who are equipped with operationally safe and task-appropriate equipment. Subcontractors with inadequate or defective equipment will not be allowed to conduct operations until operationally safe equipment is supplied. Additionally, the subcontractor and suppliers must agree to identify and inform the SS of all hazards associated with their specific activities. This will allow the SS and UXOSO to evaluate whether these hazards can be controlled by procedures in either this APP or the SSHP, or if new procedures and AHAs will be required.

5.0 TRAINING

5.1 NEW HIRE SAFETY AND OCCUPATIONAL HEALTH ORIENTATION

5.1.1 HAZWOPER Training

PIKA conducts a large variety of operations which involve many different task-related hazards under contract with various Federal, State and commercial clients. These contracts often involve the performance of work involving uncontrolled hazardous waste sites. Therefore, PIKA requires all of its site personnel to provide documentation of having completed the OSHA-required 40-Hour HAZWOPER course, as applicable to the OSHA regulatory standard. This requirement also has the benefit of making sure all PIKA personnel have a baseline safety orientation and background knowledge of the topics taught in the 40-hour HAZWOPER course, to include:

1. PPE use, limitations, and maintenance;
2. Basic hazard assessment and control measures;
3. General contamination control and decontamination procedures;
4. Medical surveillance requirements;
5. Types and effects of chemical exposure;
6. Identification and control of physical hazards such as heat/cold stress and noise;
7. Identification and control of biological hazards; and
8. Employee hazard communication (HAZCOM) Right-to-Know regulations.

5.1.2 Review of the Project Safety Plan

Before being allowed to participate in site activities where an exposure to safety or health hazards exists, new field personnel and supervisors will read the project APP. As required in the plans, the employees will sign the appropriate plan review form

indicating they have read and understand the ES&H provisions and requirements outlined in the plan.

5.1.3 Required Safety Orientation, Site and Task Hazard Training

Before they participate in site activities, personnel will be given employee safety orientation training using the PIKA Employee Safety Orientation Checklist (Form 534) as an outline and employee acknowledgment document.

This training will include site- and hazard-specific information training as required by OSHA 29 CFR 1910.120(i). This training will be based upon general hazards of the site, the tasks to be performed, and the hazards associated with defined tasks.

All employees will be given this training; and all site training required by this section will be conducted, or arranged for, by the SS. All training will be documented using the PIKA Safety Training Attendance Log (Form 503) and the PIKA Employee Safety Orientation Checklist (Form 534).

At no time will new PIKA personnel be permitted to conduct any site operations involving the potential for exposure to safety or health hazards until they have received appropriate training and reviewed each corresponding AHA.

5.2 MANDATORY TRAINING/CERTIFICATIONS APPLICABLE TO PROJECT

The mandatory training and certifications and periodic retraining and recertification that are applicable to each PWS will be conducted for all site personnel. Included in the mandatory training/certification will be the OSHA training requirements outlined in 29 CFR 1910 and 1926, as well as any additional training required by USACE EM 385-1-1 applicable to the tasks associated with each PWS. The UXOSO will document all training provided on site using the PIKA Safety Training Attendance Log (Form 503). The UXOSO will also verify the training/certifications of the site personnel. Updated personnel training certifications will be filed with the RVAAP operating contractor (VISTA).

5.3 PERIODIC S&H TRAINING FOR SUPERVISOR AND EMPLOYEES

Once per week (usually Monday), a safety briefing will be presented in conjunction with the daily safety briefing. This briefing will consist of information about site hazards or general safety/health issues relevant to the site personnel, and it will be delivered by the UXOSO or a speaker selected by the SS. All site personnel will attend the training, and the UXOSO will document this training on the PIKA Documentation of Training form.

Additional OSHA-required training, as deemed necessary by the CESHM, will be provided as needed. Such training may relate to specific chemical contaminants (such as lead or arsenic) or task-specific hazards such as confined space, heavy equipment, hand-tool operation or special PPE.

5.4 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING

All PIKA personnel involved with responding to an on-site emergency will be briefed in their roles and responsibilities as required by paragraph 9.b. of Appendix A in USACE EM 385-1-1. This training will be documented and will also involve a documented rehearsal of the emergency response plan before to the start of site activities.

6.0 SAFETY AND HEALTH INSPECTIONS

6.1 DAILY AND WEEKLY SAFETY INSPECTIONS AND AUDITS

The UXOSO will conduct daily inspections and weekly audits, using the Daily/Weekly Safety Inspection and Audit Form-506, and will communicate the results to the SS. The form will be maintained at the site, and at the conclusion of the weekly audit, a courtesy transmittal will be forwarded to the CESHM for review. The transmittal may take the form of email and will outline the following:

- Synopsis of site activities;
- Ongoing safety and health deficiencies/concerns;
- Upcoming site activities; and
- Upcoming safety and health concerns.

Additionally, any daily checklist with deficiencies noted will also be forwarded to the CESHM. Once a deficiency has been corrected, the UXOSO or SS will notify the CESHM of the resolution. It is imperative that for each deficiency noted, there is documentation (both on the inspection/audit form, and the Daily Safety Log) of the remedial actions taken to correct the deficiency.

6.2 PERIODIC CORPORATE SAFETY AND HEALTH INSPECTIONS

During the course of the site operations, the PM will conduct regular site inspections. The PM will generate an Inspection Report, which will detail the parameters of the inspection and the observations and findings. A copy of this report will be distributed to the on-site team for review and action. Deficiencies noted during the inspection will be logged and tracked until mitigated/abated.

6.3 DEFICIENCY TRACKING AND FOLLOW-UP

Any deficiencies noted during a site inspection or audit will be reported to the CESHM and noted on the Safety and Occupational Health Deficiency Tracking Log (Form 535). The UXOSO will conduct the follow-up on the deficiency to track and

log the corrective actions. When the form is completed, the UXOSO will forward a copy of the completed form to the CESHM, who will then verify the adequacy of the corrective actions. This form will be posted on the Site Safety Bulletin Board or within the Site Safety Binder (as applicable).

6.4 EXTERNAL INSPECTIONS/CERTIFICATIONS REQUIRED

With the exception of government quality assurance inspections, additional external inspections/certifications are not anticipated for this project. In the event that an external inspection/certification is required, PIKA site management personnel will fully cooperate with the external inspection/certification personnel as specified in the project PWS and site plans.

7.0 ACCIDENT REPORTING

7.1 MANPOWER REPORTING

Field hours will be recorded by the SS on the PIKA daily report. PIKA will use this to report total field hours, on a monthly basis, to CELRL PM or designee.

7.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

In the event that an accident/incident occurs at the job site, the PIKA PM will notify the USACE PM. The PIKA Accident form will be completed and forwarded, the same day the accident/incident occurs to the CESHM and the PM before dissemination to the USACE PM. In addition, if USACE Form 3394 must be completed, the UXOSO will complete the form and forward it to the CESHM and the PIKA PM for review prior to dissemination to client. If a near miss occurs, the UXOSO will immediately investigate the near miss and report the results of the investigation to the CESHM and PM.

USACE Preliminary Accident Notification must be submitted within 24 hours of any medical treatment, other than first aid, and all accidents with over $2,000 of damage.

7.3 PERSONS RESPONSIBLE FOR ACCIDENT REPORTING AND INVESTIGATION

The following personnel will be responsible for accident reporting and investigation as required in Section 8 of Appendix A in EM 385-1-1:

- Accident investigations – The SS and the UXOSO (Form 502) (USACE Form 3394 if applicable);
- Accident reports: The UXOSO (verbal and written using Form 502) (USACE Form 3394 if applicable).
- Accident logs: The PIKA CESHM (PIKA OSHA 300 and 300A logs).

7.4 IMMEDIATE ACCIDENT NOTIFICATION

Immediate notification will be made to the USACE PM, USACE Contracting Officer or Contracting Officer Representative for any of the following:

- A fatal injury,
- A permanent total disability,
- A permanent partial disability,
- The hospitalization of three of more personnel resulting from a single event, and
- Property damage of $200,000 or more.

8.0 APPLICABLE PLANS/PROGRAMS/PROCEDURES

Only those plans that are applicable to this PWS have been addressed in this section. In the event that future work conducted under this APP requires additional plans, this APP will be amended to include the additional plans, programs, and procedures.

8.1 LAYOUT PLANS

Due to the duration and scope of this project, an office trailer and/or other hardened site setup materials are not applicable. PIKA's, Ohio District Office will be utilized for all administrative and material support.

8.2 EMERGENCY RESPONSE PLANS

The site emergency response and contingency plans covering the following procedures are presented in Section 15.0 of the SSHP. As a minimum, the emergency response plans in the SSHP include the following:

1. Procedures and tests;
2. Spill plans;
3. Firefighting plan;
4. Posting of emergency telephone numbers;
5. Medical support, both on-site medical support and off-site medical arrangements including rescue and medical duties for those employees who are to perform them; and the names of on-site personnel trained in first aid and CPR.

8.3 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

8.3.1 Introduction

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

The management of PIKA is thoroughly committed to providing a drug-free workplace for all employees.

Drug and/or alcohol use and abuse are incompatible with the PIKA high standards of performance, safety, and quality. As a term of employment, all employees agree to refrain from the use, distribution, possession, manufacture or dispensing of a controlled substance and drug and/or alcohol abuse. Violation of this policy may result in administrative action including termination of employment. PIKA's approved Drug and Alcohol Program (SOP 527) found in Attachment 3, will be implemented during all site activities associated with this PWS.

Key points applicable to PIKA's drug and alcohol program are:

- While on duty, employees may not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances.
- Employees found to be under the influence of or consuming such substances will be immediately removed from the job site.
- Any employee under a physician's treatment and taking prescribed narcotics or any medication that may prevent one being ready, willing, and able to safely perform position duties will provide a medical clearance statement to their supervisor.

8.4 SITE SANITATION PLAN

Personal hygiene and sanitation facilities will be established on site IAW 29 CFR 1910.120(n) and PIKA SOP 512 to ensure personnel maintain good personal hygiene. Site-specific sanitation requirements will be specified in the SSHP and will address, as a minimum, personal washing area, toilet facilities, and a lunch/break area.

8.5 ACCESS AND HAUL ROAD PLAN

An Access and Haul Road Plan is not applicable. If one becomes necessary, a plan will be developed as an addendum to this APP.

8.6 RESPIRATORY PROTECTION PLAN

The use of respiratory protection is not applicable. If one becomes necessary, a plan will be developed as an addendum to this APP.

8.7 HEALTH HAZARD CONTROL PROGRAM

The SSHP developed for this project and presented in Attachment 1 of this APP meets the requirements of the Health Hazard Control Program as outlined in EM 385-1-1, Paragraph 06.A.02.

8.8 HAZARD COMMUNICATION PLAN

HAZCOM training will be provided for all site personnel who will use products containing hazardous substances. This training complies with the requirements of the OSHA HAZCOM Standard, 29 CFR 1910.1200. This training will be provided upon initial assignment to the site and before use of the products containing hazardous substances. Supplemental HAZCOM training will be scheduled and presented whenever a new hazardous substance is introduced into the work area or an employee changes job location where new products are encountered.

The requirements for HAZCOM training are outlined in the SOP 509 of the CESHP and Section 5.7 of the SSHP.

8.9 PROCESS SAFETY MANAGEMENT PLAN

A process safety management plan is not required for this project as no highly hazardous chemicals are anticipated as defined in paragraph 06.B.04 of EM 385-1-1.

8.10 LEAD ABATEMENT PLAN

This plan will not be required for this APP as no occupational exposures to lead are anticipated during this project.

8.11 ASBESTOS HAZARD ABATEMENT PLAN

An Asbestos Hazard Abatement Plan is not applicable to this project.

8.12 RADIATION SAFETY PROGRAM

A radiation safety program is not applicable to this project.

8.13 ABRASIVE BLASTING

An abrasive blasting plan is not applicable to this project.

8.14 HEAT/COLD STRESS MONITORING PLAN

The PIKA procedures for the evaluation and control of heat and cold stress are presented in Section 9.0 of the SSHP.

8.15 CRYSTALLINE SILICA MONITORING PLAN

A crystalline silica monitoring plan is not applicable to this project.

8.16 NIGHT OPERATIONS LIGHTING PLAN

A night operation lighting plan is not applicable to this project.

8.17 FIRE PREVENTION PLAN

The fire prevention plan for this project is presented in Section 15.4.1 of the SSHP.

8.18 WILD LAND FIRE MANAGEMENT PLAN

A wild land fire management plan is not applicable to this project.

8.19 HAZARDOUS ENERGY CONTROL PLAN

A hazardous energy control plan is addressed in Section 10.10 of the SSHP.

8.20 CRITICAL LIFT PLAN

A critical lift plan as defined in paragraph 16.H.01 of USACE EM 385-1-1, is not applicable to this project.

8.21 CONTINGENCY PLAN FOR SEVERE WEATHER

The severe weather plan for this project is presented in Section 15.4.2 of the SSHP.

8.22 FLOAT PLAN

A float plan is not applicable to this project.

8.23 SITE- SPECIFIC FALL PROTECTION & PREVENTION PLAN

A fall prevention plan is not applicable to this project.

8.24 DEMOLITION PLAN

A demolition plan is not applicable to this project.

8.25 EXCAVATION AND TRENCHING PLAN

An excavation and trenching plan is not applicable to this project.

8.26 EMERGENCY RESCUE FOR TUNNELING

A plan for emergency rescue for tunneling is not applicable to this project.

8.27 UNDERGROUND CONSTRUCTION FIRE PREVENTION/PROTECTION PLAN

A plan for underground construction fire prevention/protection is not applicable to this project.

8.28 COMPRESSED AIR PLAN

A compressed air plan is not applicable to this project.

8.29 FORMWORK AND SHORING ERECTION AND REMOVAL PLANS

A formwork and shoring erection and removal plan is not applicable to this project.

8.30 PRECAST CONCRETE PLAN

A precast concrete plan is not applicable to this project.

8.31 LIFT SLAB PLAN

A lift slab plan is not applicable to this project.

8.32 STEEL ERECTION PLAN

A steel erection plan is not applicable to this project.

8.33 SSHP FOR HTRW WORK

A SSHP for this project has been developed and is included in Attachment 1 of this APP.

8.34 BLASTING SAFETY PLAN

A blasting plan as outlined in EM 385-1-1 Section 29.A is not applicable to this project.

8.35 DIVING PLAN

A diving plan is not applicable to this project.

8.36 CONFINED SPACE PROGRAM

A confined space program is not applicable to this project.

9.0 RISK MANAGEMENT PROCESSES

As defined in Section 1.7 of this APP, detailed project-specific hazards and controls will be identified and provided by an AHA for each major phase/activity of work.

ATTACHMENT 1

SITE SAFETY AND HEALTH PLAN

SITE SAFETY AND HEALTH PLAN APPROVAL

Project: Site Inspection – Compliance Restoration Site CC RVAAP-80 (Group 2 Propellant Can Tops Area).

Site, Location: Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio

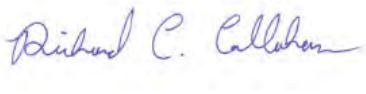
The PIKA International, Inc. (PIKA) personnel referenced below have reviewed and approved this Site Safety and Health Plan (SSHP) for implementation for the above referenced work. Procedures for the submission, approval, integration and implementation of changes to this SSHP are discussed within the body of the SSHP and will be followed whenever a change will significantly impact the safety of site personnel, the environment or off-site personnel.

Prepared by:

Date: 11/23/15

Sarosh Manekshaw, Certified Safety Professional (CSP)
PIKA Corporate Safety and Health Manager

Plan Concurrence By:



Date: 11/23/15

Richard Callahan
PIKA Project Manager

Approval by:

Date: 11/23/15

Shahrukh Kanga
PIKA Principal

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LIST OF ACRONYMS

ºF	degrees fahrenheit
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
ALS	advanced life support
APP	Accident Prevention Plan
BBP	bloodborne pathogens
BLS	basic life support
CELRL	USACE - Louisville District, Louisville, Kentucky
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CESHM	Corporate Environmental Safety and Health Manager
CESHP	Corporate Environmental Safety and Health Program
CSP	Certified Safety Professional
dBA	decibels
EC	Emergency Coordinator
EM	Engineering Manual
EMS	emergency medical service
EMT	emergency medical technician
EPA	Environmental Protection Agency
ER	Engineer Regulation
EZ	exclusion zone
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HAZWOPER	hazardous waste operations and emergency response
IAW	in accordance with
IDW	investigation derived waste
LO/TO	lockout/tagout
MEC	munitions and explosives of concern
MSDS	material safety data sheets
NIOSH	National Institute for Occupational Safety and Health

OEL	occupational exposure limit
OHARNG	Ohio Army National Guard
OSHA	Occupational Safety and Health Administration
PIKA	PIKA International, Inc.
PM	Project Manager
PPE	personal protective equipment
RVAAP	Ravenna Army Ammunition Plant
SOP	standard operating procedure
SOW	scope of work
SS	Site Supervisor
SSHP	Site Safety and Health Plan
SWPs	safe work practices
UL	Underwriters Laboratories
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
UXOSO	Unexploded Ordnance Safety Officer
WP	Work Plan
WZ	Work Zone

1.0 PIKA CORPORATE SAFETY AND HEALTH PLAN

1.1 GENERAL

The Engineering Manual (EM) 385-1-1 Accident Prevention Plan (APP) outline specifies that a SSHP be developed as a subplan of the APP for sites where the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard is applied. Therefore, a Site Safety and Health Plan (SSHP) has been developed for this project and is presented as Attachment 1 of the APP.

1.2 SITE SAFETY AND HEALTH PLAN (SSHP)

1.2.1 *Scope*

This SSHP was developed for the site investigation activities to be conducted at Compliance Restoration Site CC RVAAP-80 (Group 2 Propellant Can Tops Area) under Contract Number W912QR-12-F-0212 at the former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. The APP to which this SSHP is attached will be the overall safety and health management document of the project, and this SSHP will present the site-specific data associated with the Scope of Work (SOW).

1.2.2 *Objective*

The primary objective of this SSHP is to provide PIKA International Inc. (PIKA) with an effective tool for the anticipation, identification, evaluation, control, and/or elimination of recognized or potential safety and health hazards anticipated with this project. The secondary objective of this SSHP is to provide PIKA with an effective communication medium for delivering site personnel task-specific and site-specific hazard information, as well as hazard control information they will use to mitigate or eliminate the risks of exposure to site and task hazards. Contingency plans and emergency response procedures have been developed for emergencies that may reasonably occur and are presented in this SSHP.

1.3 SSHP APPROVAL AND COMPLIANCE BY SITE PERSONNEL

All PIKA, subcontractor, and government personnel involved in this project are required to read this document before participating in any on-site tasks that involve potential exposure to safety or health hazards. Questions related to the information in this SSHP will be addressed to, and resolved by, the PIKA Unexploded Ordnance Safety Officer (UXOSO), with ongoing consultation from the Corporate Environmental Safety and Health Manager (CESHM).

After reading this SSHP, site personnel will complete the PIKA SSHP review and approval form contained in Attachment 4 of the APP, indicating their understanding of, and willingness to comply with, the requirements in this SSHP. All site personnel will exercise caution at all times and will immediately report to the UXOSO any site conditions that may pose a safety or health hazard.

It is the responsibility of each manager, supervisor, individual employee, and subcontractor to take notice of any unsafe situations and report them immediately so that proper action can be taken to eliminate them. Additionally, it is the responsibility of each employee to bear in mind their personal safety and the safety of all site personnel at all times. Unsafe working habits, horseplay, and the like, which could endanger the health and safety of others, will not be tolerated. Disciplinary action up to, and including, termination will result from such actions.

1.4 CHANGES TO THE APPROVED SSHP

The levels of Personal Protective Equipment (PPE) and the safe work practices (SWPs) specified in this plan are based on the best available information from archival data, anticipated site conditions, and professional experience gained from operations PIKA has performed previously at Camp Ravenna. It is understood that this SSHP is a living document, and the actual site tasks may require changes in PPE, monitoring, SWPs, or other elements of the SSHP. As such, this SSHP includes provisions for changing the levels/types of PPE used and monitoring procedures. These changes are based upon anticipated site conditions and will be used only if

applicable action levels and conditions found in Table 8-1 are met and documented. Requests to downgrade or upgrade PPE or monitoring requirements will be made by the UXOSO to the CESHM and may be implemented once the PIKA CESHM has assessed and concurred with the approach.

If a previously unassessed task is identified, or a proposed change requires a written revision of the SSHP, the Project Manager (PM) will submit a written request for change to the PIKA CESHM with attached documentation. Approved changes to the SSHP and the modified pages of the SSHP will be forwarded to the Site Supervisor (SS) and PM upon approval by the CESHM. Notification and update pages will be sent to all stakeholders. If a proposed change involves the addition of a previously un-assessed task or significantly affects the safety of on-site personnel, off-site personnel, or the environment, a written request for approval will be submitted to the U.S. Army Corps of Engineers – Louisville District (CELRL), Louisville, Kentucky. Changes of this nature will not be allowed until written approval of the CELRL Contracting Officer's Representative (COR) has been received and the SSHP updated.

1.5 REGULATIONS AND REFERENCES

The applicable sections of the regulations and references listed below will be used in conjunction with this SSHP to ensure the safety and health of on-site personnel and the local community:

- USACE Engineer Regulation (ER) 385-1-92 Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW), 1 May 2007 and Errata #1;
- RVAAP Facility-Wide Safety and Health Plan for Environmental Investigations at RVAAP (USACE 2011);
- Current versions of the OSHA General Industry (29 Code of Federal Regulations (CFR) 1910) and Construction Standards (29 CFR 1926);

- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values® and Biological Exposure Indices ® for 2012;
- National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, (Current Version);
- The PIKA Corporate Environmental Safety and Health Program (CESHP);
- Safety and Health Requirements Manual, USACE EM385-1-1, 15 September 2008; and
- NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Department of Health and Human Services, (DHHS) NIOSH Publication No. 85-115).

2.0 SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION

2.1 RVAAP LOCATION AND HISTORY

2.1.1 RVAAP Location

Details of the location of the RVAAP have been provided in subsection 1.5.2 of the APP.

2.1.2 RVAAP History

The site history of the RVAAP has been provided in Section 1.6 of the APP.

2.2 SITE CLIMATE

Table 1 summarizes the area climate data including the average and record monthly temperature highs and lows. Average monthly precipitation is also presented. Owing to its location in northeast Ohio, the climate is relatively moderate, but can be severe at times.

TABLE 1: WEATHER DATA

Month	Avg. High	Avg. Low	Mean	Avg. Precip.(inches)	Record High	Record Low
January	33°F	19°F	26°F	2.61	73°F (1906)	-25°F (1994)
February	36°F	21°F	29°F	2.31	72°F (2000)	-20°F (1899)
March	46°F	28°F	37°F	3.40	82°F (2012)	-7°F (1948)
April	59°F	38°F	49°F	3.55	89°F (1915)	10°F (1964)
May	69°F	48°F	58°F	4.28	94°F (1895)	24°F (1966)
June	78°F	57°F	67°F	3.83	100°F (1988)	32°F (1972)
July	82°F	61°F	72°F	3.80	102°F (1936)	41°F (1904)
August	80°F	60°F	70°F	3.56	104°F (1918)	39°F (1915)
September	73°F	53°F	63°F	3.45	99°F (1953)	29°F (1942)
October	61°F	42°F	52°F	2.83	89°F (1927)	20°F (1952)
November	49°F	34°F	41°F	3.28	80°F (1961)	-1°F (1958)
December	37°F	24°F	30°F	2.84	76°F (1982)	-16°F (1989)

Source: http://www.weather.gov/cle/local_climate;;
Updated October 2012.

2.3 PROJECT TASKS

The field tasks listed below are those for which site personnel may be exposed to site- and job related safety and health hazards. Additional information related to the physical steps and equipment that will be used to accomplish these tasks is presented in greater detail within the project Work Plan (WP). As part of the project training, all site personnel will read the WP and be familiar with the steps.

- Mobilization, site setup, demobilization;
- Conduct site preparation to include vegetation removal.
- Identify, collect, certify as safe and dispose of the propellant tops and cans associated the anomalies identified during the previous site investigation.
- Collect ISM five (5) surface and three (3) subsurface soil samples within the areas of the referenced anomalies.
- Perform sample analysis for the common propellants used by DoD including nitrocellulose, nitroglycerine, nitroguanidine, and perchlorate.
- Analysis and disposal of IDW.
- Manage and validate data IAW EPA Contract Laboratory Program (CLP) Level IV data validation to meet the requirements of DoD Quality Systems Manual (QSM).
- Survey and map the site.

2.4 CONTAMINATION CHARACTERIZATION

The information provided by RVAAP and PIKA's institutional knowledge of the facility, gives PIKA a means of compiling a summary of hazardous substances and safety and health hazards likely to be encountered during site operations. A description of the risk of exposure to the hazardous substances is presented in subsection 3.2.2.

TABLE 2: TYPE OF CONTAMINANTS

Contaminant of Concern	Concentration Ranges	Media Where Found	Locations Onsite
Propellant: • Nitroglycerine • Nitroguanidine • Nitrocellulose	Trace residual	Surface and subsurface soil samples	Group 2 Propellant Can Tops Area

TABLE 3: OCCUPATIONAL EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR CONTAMINANTS WITH OCCUPATIONAL HEALTH CONCERNS

CONTAMINANT OF CONCERN	OSHA PEL TWA	ACGIH TLV TWA	ACGIH & OSHA STEL	NIOSH IDLH	IP eV	Vapor Pressure (mm/hg)	Route of Exposure	Symptoms of Exposure
NITROGLYCERINE	2 mg/m3 [skin] (ceiling)	0.46 mg/m^3	ST 0.1 mg/m3 [skin] (NIOSH)	0.1 mg/m^3	NA	0.0003	INH, ING, ABS, CON	Throbbing headache, dizziness, nausea, vomit, abdominal pain, hypotension, flush, palpitations, methemoglobinemia, delirium, central nervous system depressant/depression, angina, skin irritation
NITROGUANIDINE	NA	NA	NA	NA	NA	0.12	INH, ING, ABS, CON	Irritation eyes, skin, nausea, vomiting, diarrhea, respiratory tract irritation
NITROCELLULOSE	NA	NA	NA	NA	NA	NA	INH, ING, ABS, CON	Severely irritates skin and may result in severe pain; severely irritates eyes and may result in severe pain; harmful if swallowed; swallowing may result in severe stomach pain. Inhalation; May cause irritation of the respiratory tract and mucous membranes.

INH=Inhalation ING=Ingestion ABS= Skin Absorption CON=Skin or mucous membrane contact NA=Not applicable or available TLV=Threshold Limit Value IP=Ionization Potential IDLH=Immediately Dangerous to Life or Health STEL=Short Term Exposure Limit TWA=Time-Weighted Average PEL=Permissible Exposure Limit eV=electron volt mg/m^3 =milligrams per cubic meter mmHg=millimeters of mercury

3.0 HAZARD ANALYSIS AND RISK ASSESSMENT

3.1 INTRODUCTION AND GENERAL REQUIREMENTS

During the development of this SSHP, all known, or anticipated, chemical, physical, or biological hazards that may pose a threat to the well-being of site personnel have to the greatest extent possible been identified, and the risk of exposure to each has been assessed. The nature of the site and the tasks to be performed, along with the contaminants of concern hazards, indicate that the overall level of hazard caused by exposure to chemical contaminants is low while the risk of exposure to physical hazards is high.

To ensure the safety and health of site personnel and the public, and to comply with the hazard assessment requirements of the OSHA PPE standard (29 CFR 1910.132(d), PIKA has generated Activity Hazard Analysis (AHA) forms for each site task with potential hazards that would require the use of engineering controls, administrative controls, or PPE to minimize worker exposure. The AHAs for this project are presented in Attachment 2 of the APP. The UXOSO and SS will use the AHAs to brief site personnel on the type and degree of hazard to be expected during site operations and the means to safeguard themselves from the hazards.

The hazard analyses and risk assessments presented in this SSHP have used the best available data. All site personnel must understand that the evaluation of site characteristics and hazards is an ongoing process that will continue throughout the duration of the project. All personnel must be vigilant in recognizing workplace hazards and bring them to the attention of the UXOSO and/or SS. If changes occur in the level or types of hazards present, the UXOSO will inform the PIKA CESHM of the change. Based upon his evaluation, the CESHM will either facilitate the modification of an existing AHA or the development of a separate AHA for the newly introduced task. Any additions to the approved SSHP will be reviewed and approved by the responsible PIKA personnel and submitted to the CELRL Program Manager for final approval. Once approved, the changes will be added to the SSHP.

3.2 CHEMICAL HAZARDS

3.2.1 *Exposure Standards*

For optimal protection, the USACE position will be followed and enforced using the criteria on providing protection from exposure through inhalation, ingestion, skin absorption, or physical contact, to any chemical, biological, or physical agent in excess of the acceptable limits specified in the most recently published ACGIH guidelines, "Threshold Limit Values and Biological Exposure Indices," or by OSHA, whichever are more stringent. For the purpose of this site plan, the term used for the most stringent standard is the Occupational Exposure Limit (OEL). In addition, all cases where ACGIH differs from other standards or regulations, the most stringent shall prevail. PIKA will comply with all applicable standards and regulations to reduce contaminant levels as low as reasonably achievable.

3.2.2 *Risks of Exposures to On-site Chemicals*

Project-specific tasks offering exposure are related to mobilization; site setup; vegetation removal; and soil sampling operations. While personnel could be exposed to propellants (residues) while handling soil, the potential for personnel to receive an occupational exposure is expected to be remote. Personnel will wear gloves and conduct operations outdoors in a well-ventilated area to further minimize the risk of exposure. No other chemical hazards to which personnel may be exposed are anticipated.

3.2.3 *Risks of Exposures to Task-Related Chemicals*

Exposure to chemicals may occur during tasks that require the use of products that contain hazardous materials. The products that will be used on-site that contain hazardous materials include insect repellant, spray paint, gasoline, and diesel fuel. During the use of these materials, personnel exposures will be controlled and minimized by limiting the quantities that will be used at any one time and using the products in well-ventilated areas. Additionally, the SWPs and PPE outlined in this

SSHP will be used as necessary to further reduce or eliminate the potential for personnel exposure to these hazardous materials. If site activities are modified, or if evidence of environmental chemical contamination is found, the potential for chemical exposure will be re-evaluated.

3.3 PHYSICAL HAZARDS

Given the nature of the planned site operations, the potential and risk for exposure to physical hazards are low for this project. Physical hazards that are anticipated during site operations include:

- Flammable/explosive materials including, gasoline and diesel fuel;
- Lifting hazards such as back strain, pulled muscles and tendons, pinched/crushed fingers and toes;
- Slip, trip and fall hazards associated with uneven terrain, ground cover, exposed tree/brush stumps, rocks, vegetation growth, and the stream bed;
- Inclement weather such as heavy rain, thunder/lightning storms, and tornados;
- Exposure to high temperatures and humidity;
- Exposure to cold temperatures and potential for frost bite;
- Rusting metal items that are present in the site soils, and other items that may cause cut, scrape, puncture, splinter or laceration injuries;
- Loading and Unloading of project related materials, equipment and supplies; and
- Operation of tools and equipment.

Site personnel will receive appropriate instructions on the physical hazards associated with operating equipment and tools and maintenance and hazard controls as discussed in the applicable AHAs and PIKA Standard Operating Procedures (SOPs). Site personnel will also be instructed to remain alert to the

presence of potential physical hazards and to report immediately any changing conditions to the UXOSO and/or SS. The PIKA SS and UXOSO are responsible for evaluating each day's field operations with respect to potential physical hazards. Any suspect or known physical hazards, and the specific procedures to control them, will be reviewed during the daily safety briefing. Procedures for reducing or eliminating the physical hazards are discussed in Section 10.0 of this SSHP.

3.4 BIOLOGICAL HAZARDS

Biological hazards and related procedures have been addressed within Section 10.17 of this SSHP and within SOP 503 (Biological Hazards).

3.5 MUNITIONS AND EXPLOSIVES OF CONCERN (MEC)

Based upon the information to date, the site is a low probability site in regards to encountering MEC. However, the propellant tops and cans are considered MPPEH until inspected and certified as MDAS. If during inspection and certification either a propellant can / lid or a non-packing item is encountered and determined to be and certified as a Material Documented with an Explosive Hazard (MDEH) item, the location will be documented and fieldwork will be halted immediately. The item will be reported to the USACE OESS and Camp Ravenna Range Control for collection and disposition. Based upon the potential hazard of the item found the site may need to be re-evaluated and potentially assigned a new probability rating.

Each employee shall be familiar with and comply with the below procedures and USACE EM 385-1-1, Section 33 Munitions and Explosives of Concern (MEC) during investigation activities.

a. Recognize. Recognize the hazard and do not touch, disturb, or move the item as it could detonate with movement or ground vibrations.
b. Retreat. Stop work, mark the general location, and have everyone retreat from the area.

c. Report. Report the situation immediately to the appropriate local emergency response authority (call Camp Ravenna Range Control at 614-336-6041 to initiate the required emergency response personnel), providing as much information as possible about the items encountered. USACE personnel should also notify their project chain of command, District Safety Office, and installation staff as appropriate.

4.0 SAFETY AND HEALTH ORGANIZATION AND RESPONSIBILITIES

4.1 GENERAL STAFF INFORMATION

Personnel who may be exposed to on-site safety or health hazards are subject to, and will comply, with this SSHP. At no time will site personnel conduct tasks or operations in a manner that conflicts with the safety, health, or environmental precautions expressed in this SSHP. Ensuring site safety is a joint effort promoted by all site personnel; however, the personnel listed in Sections 4.2 through 4.6 have been given key safety-related responsibilities and are part of the on-site safety and health chain of command. The project safety and health organizational chart is presented in Figure 1.

4.2 PIKA PROGRAM MANAGER

PIKA's Program Manager, Ms. Kathleen Anthony, is ultimately responsible for the safety and health of all PIKA personnel and for ensuring the integration of safety and health practices into every facet of PIKA's business practices. It is PIKA's fundamental belief that the safety and health of each worker is paramount to all other aspects of conducting work, and the responsibility for safety and health starts with the PIKA Program Manager and flows through the PIKA Project Manager's to the site personnel. This owner and management "buy-in" to safety and health sets the standard for all PIKA employees.

4.3 PROJECT MANAGER (PM)

The PM for this project will be Richard Callahan, who is responsible for the successful performance of the project. To achieve success, this project must be completed in a safe and healthful manner. Therefore, as related to safety and health, the PM will:

- Manage and provide the funding, manpower, and equipment resources needed to conduct site operations safely.
- Review this SSHP and have a thorough understanding of its requirements.
- Furnish copies of the WP and SSHP to site personnel for their review.
- Coordinate with the CESHM to ensure that all anticipated project-specific safety and health issues have been addressed in this SSHP.
- Coordinate the assignment of subcontractors and ensure that subcontractor personnel and equipment meet the requirements of the WP and SSHP.
- Consult and support the PIKA SS regarding safety and health issues.
- Coordinate with the CESHM to ensure site compliance with the SSHP and the PIKA CESHP.
- Communicate the potential site and task hazards that could affect safe site operations with the SS and UXOSO.

4.4 CORPORATE SAFETY AND HEALTH MANAGER (CESHM)

PIKA's CESHM is Mr. Sarosh Manekshaw, a Certified Safety Professional (CSP) with experience in industrial hygiene, safety, UXO, and hazardous waste. Mr. Manekshaw has completed the OSHA HAZWOPER Hazardous Materials Technician and supervisor training requirements in accordance with (IAW) 29 CFR 1910.120. He will provide occupational safety and health technical support to the UXOSO and other project personnel. As the CESHM, he will:

- Report directly to PIKA's President regarding safety and health issues.
- Facilitate the development, approve, and seal this SSHP.
- Coordinate with PIKA's UXOSO for field implementation of this SSHP.
- Communicate and consult with the PM, SS, and UXOSO.
- Evaluate and authorize any changes to this SSHP.

- Conduct, or assist in the presentation of, site, task and hazard-specific training.
- Directly interface with, and relay safety and health concerns to CELRL's PM.
- Conduct periodic site safety and health audits.
- Ensure site and personnel compliance with PIKA's CESHP.

4.5 SITE SUPERVISOR (SS)

The SS for this project will be Ms. Margaret Carte, PG. Ms. Carte is a Professional Geologist and has completed the OSHA 40-hour HAZWOPER site worker and refresher training, the 8-hour Supervisor/Manager training requirements IAW 29 CFR 1910.120, and is certified in first aid and cardiopulmonary resuscitation (CPR). Ms. Callen will be responsible for the on-site management of all PIKA field operations. As the SS, Ms. Carte will:

- Ensure the safety and health issues have been addressed in the SOW.
- Consult and coordinate with the PM for the implementation of site tasks and coordinate with subcontractors regarding schedule and contract requirements.
- Schedule and present the operational portion of the daily safety briefing.
- Enforce compliance with this SSHP and the WP.
- Act as the lead technical consultant for all sampling and geological related matters.

4.6 UNEXPLODED ORDNANCE SAFETY OFFICER (UXOSO)

The SSHO for this project will be Mr. Cameron Wenzel, who will be responsible for the on-site implementation of the safety and health requirements presented in this SSHP. Mr. Wenzel has completed the OSHA 40-hour HAZWOPER site worker and refresher training, the 30-hour OSHA Occupational Safety for the Construction

Industry, and the 8-hour Supervisor/Manager training requirements IAW 29 CFR 1910.120. He is trained and certified in first aid and cardiopulmonary resuscitation (CPR). To ensure on-site safety and health, the UXOSO will:

- Initiate and authorize a "Stop Work" order for any imminent safety or health concerns.
- Implement and enforce the requirements outlined in this SSHP.
- Conduct the safety portion of the daily safety briefings.
- Conduct and document site training related to site-specific hazards.
- Specify proper levels of PPE IAW the requirements of this SSHP.
- Implement and enforce the PIKA alcohol/drug abuse policy.
- Investigate injuries, illnesses, accidents, incidents, and near misses.
- Conduct visitor orientation, daily safety inspections, and weekly safety audits.
- Ensure field implementation of the PIKA CESHP.
- Manage and maintain on-site safety documentation and employee certifications.

4.7 GENERAL SITE PERSONNEL

It is the responsibility of all assigned personnel to ensure the safe and healthful conduct of site operations. Therefore, all project personnel involved in site activities will:

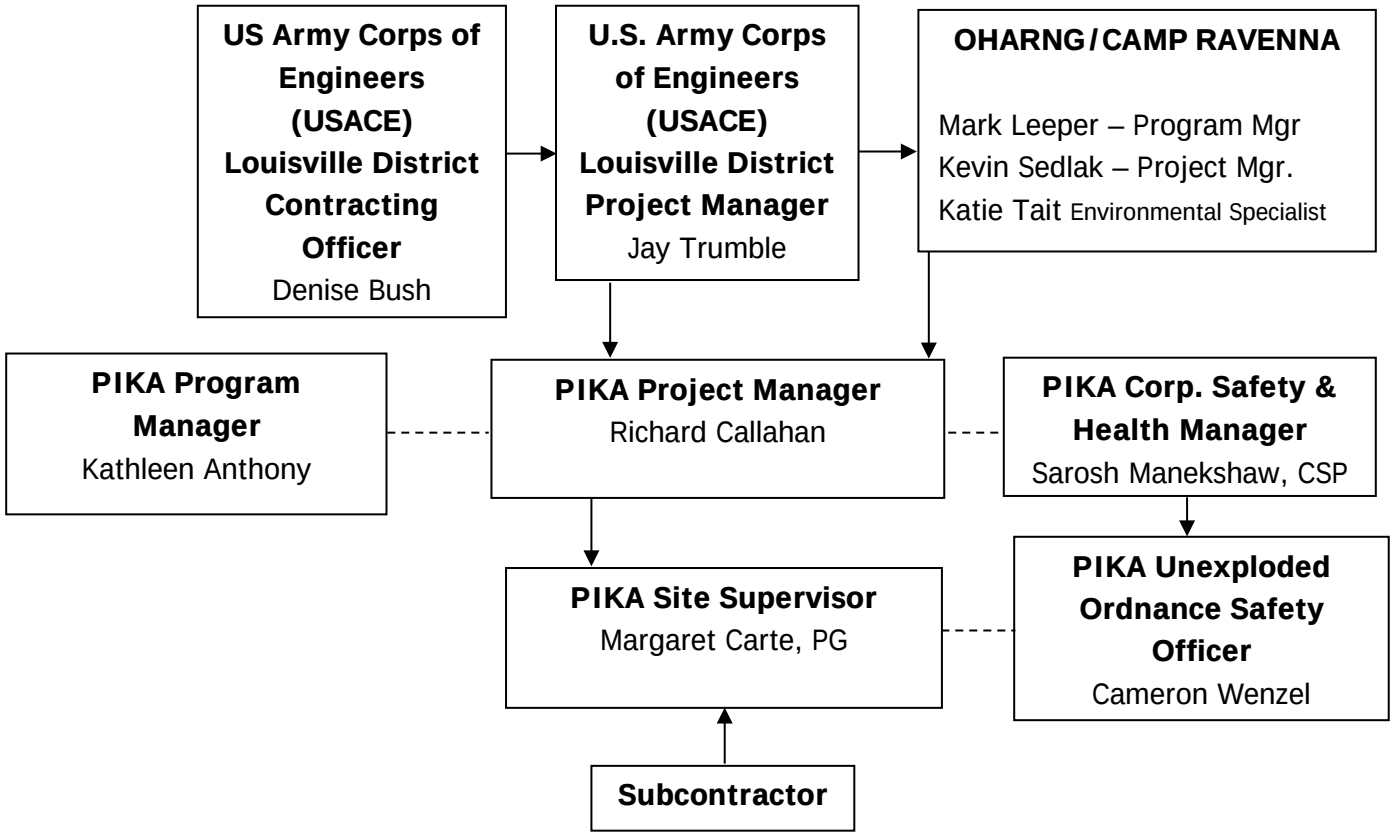
- Comply with this SSHP and all other required safety and health guidelines.
- Take all necessary precautions to protect themselves and fellow site personnel.
- Remain alert to the presence of potentially harmful conditions/situations and immediately inform the UXOSO of the hazard.

- Perform only those tasks that they can do safely and for which they have received appropriate training.
- Notify the UXOSO of any special medical conditions (i.e., allergies, contact lenses, diabetes) or medications, that could affect their ability to perform site operations safely.
- Prevent the spilling and splashing of environmentally hazardous materials.
- Practice good housekeeping by keeping the work area neat, clean, and orderly.
- Report all injuries immediately, no matter how minor, to the UXOSO.
- Maintain equipment in working order and report defects to the UXOSO.
- Inspect and use the PPE required by the SSHP or the UXOSO.

4.8 SUBCONTRACTORS

Any subcontractor working for PIKA on this project site will be responsible for providing site personnel who have read, understand, and will comply with this SSHP, as well as the subcontractor own project plans. The subcontractor must provide documentation that the personnel assigned to the project have the training and medical surveillance required by this SSHP. The subcontractor will also be responsible for providing equipment that is in good repair, safe for operations, and free from any obvious hazards.

FIGURE 1: Safety and Health Chain of Command



Notes:

—— Primary line of communication

- - - - Secondary line of communication

5.0 TRAINING

In addition to that training outlined within Section 5.0 of the APP, the following training will be verified or conducted before site activities begin.

5.1 GENERAL INFORMATION

All personnel regularly entering the project site must successfully complete the training required in this section before they participate in assigned site operations. Documentation of the training will be maintained at the PIKA corporate office and the PIKA field office. Copies of the health and safety training certificates for the PIKA personnel assigned to this project are provided in Attachment 5 of the APP.

5.2 CFR 1910.120 TRAINING REQUIREMENTS

5.2.1 *40-Hour General Site Worker Training*
(as applicable to the OSHA HAZWOPER standard)

Site workers engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances and health hazards will receive a minimum of 40 hours of HAZWOPER training. Copies of the training certificates will be maintained at the PIKA Ravenna, Ohio field office and supplied to VISTA (Camp Ravenna's Operating Contractor).

5.2.2 *Three-Day On-Site Field Supervision*

All 40-hour trained PIKA on-site and subcontractor personnel typically receive a minimum of three days of on-site supervised field experience under the direct supervision of a trained, experienced supervisor. This supervision will familiarize site personnel with the site-specific organization, PPE, and emergency response procedures. The on-site supervision is site-specific and will be documented using the Supervised On-site Field Experience Form (see Attachment 4 of the APP). The

UXOSO will complete and maintain this form, ensuring that all personnel receive this supervision and sign the form.

5.2.3 *8-Hour Annual Refresher Training*

All PIKA and subcontractor personnel who have attended the 40-hour HAZWOPER course will receive a minimum of 8-hours of refresher training annually. This training will cover relevant topics from the 40-hour HAZWOPER and the 8-hour management/supervisor courses, as well as critiques of any incidents that have occurred in the past year and other related topics. Training records will be maintained at the PIKA Ravenna, Ohio field office and supplied to VISTA (Camp Ravenna's Operating Contractor).

5.2.4 *30-Hour OSHA Construction Safety*

The UXOSO will have received the 30-hour OSHA course, Occupational Safety for the Construction Industry, or equivalent as specified in EM 385-1-1.

5.2.5 *Supervisor and Management Training*

Managers and other personnel who are directly responsible for the performance of hazardous waste operations, or who directly supervise on-site personnel, will have received the 40-hour HAZWOPER training and 8 additional hours of specialized supervisory training as specified in 29 CFR 1910.120I.

5.3 SITE-SPECIFIC AND HAZARD INFORMATION TRAINING

5.3.1 *Site-Specific Information Training*

Site-specific training will give personnel important information related to site operations. This training will include the following site-specific training topics:

- Site history and background;

- Site organization and chain of command;
- Proper use, maintenance and cleaning of required PPE;
- Emergency response procedures, assignments, and contacts; and
- Facility-specific requirements.

5.3.2 *Hazard-Specific Information Training*

Hazard-specific training will be presented that meets the requirements specified in 29 CFR 1910.120 (i). This training will be presented to all personnel involved in site operations and will inform personnel about the degree, nature, and level of exposure likely to occur as a result of participation in site activities. This training will cover the following topics:

- Physical and toxicological properties of any hazardous materials expected to be found on-site;
- Physical hazards associated with site operations including those hazards listed for the site tasks as outlined in AHA's (Attachment 2 of the APP);
- Biological hazards that may be encountered on-site including identification and protective methods and what to do if exposure occurs; and
- SWPs and other hazard control techniques used to minimize exposure.

5.4 VISITOR TRAINING

Site visitors are defined as persons who: (1) are not employed at the project site; (2) do not routinely enter restricted work areas; and (3) spend short periods at the site (e.g., 1 to 2 days per visit). Site visitors may include client personnel, PIKA personnel, Ohio Army National Guard (OHARNG) trainees, commercial vendors, auditors or inspectors from federal, state, or local regulatory agencies; or political representatives. It is the responsibility of all site personnel to maintain a watch for visitors approaching the site and immediately notify the SS or UXOSO of their

presence. Visitor training will comply with the requirements listed in the following subsections.

5.4.1 *General Notification Requirements For Site Visitors*

Regardless of the purpose of the site visit or the control zones to be entered, the following requirements will apply to all site visitors before they enter the site:

- The PIKA UXOSO and SS will be notified of the nature/duration of the visit.
- Camp Ravenna Range Control or Office Manager will be notified in advance of any visit. The SS will provide the information to the Camp Ravenna security personnel.
- Visitors will sign the Visitor Log by recording their names, date of visit, and the name of the company or agency represented.
- A PIKA representative will escort site visitors while in the area.
- Visitors will comply with the safety/health requirements described below.

5.4.2 *Training Requirements for Site Visitors*

- Site-specific and hazard information training as specified in Section 5.3 of this SSHP;
- Applicable personal protective levels associated with the visit and associated PPE training requirements;
- Areas of the site that are closed to visitors (e.g., review exclusion and work zones);
- The site evacuation plan and emergency procedures;
- OSHA HAZWOPER training and medical surveillance requirements as applicable to the scope and duration of visit with associated exposures; and
- Other topics as deemed appropriate.

5.5 FIRST AID AND CARDIOPULMONARY RESUSCITATION (CPR) TRAINING

At least two full-time PIKA site employees will be trained and certified in first aid and CPR. The UXOSO will be one of the two site personnel so trained. The training will be equivalent to that provided by the American Red Cross. Once trained, these employees will be given the responsibility of initial first aid response to injured employees whenever other medical support personnel are not immediately available.

5.6 BLOODBORNE PATHOGEN TRAINING

PIKA's first aid-trained personnel are responsible for rendering aid in the event of an injury or accident. The first aid/CPR-trained personnel who have a potential for occupational exposure to blood or other potentially infectious body fluids will receive training as outlined in the 29 CFR 1910.1030(g)(2) and the PIKA Bloodborne Pathogens (BBPs) SOP 508.

A detailed discussion related to the training required prior to personnel using PPE is presented in Section 6.5 of this SSHP. It is essential that all site personnel fully understand the need for the PPE, as well as the limitations and proper care of the PPE.

5.7 HAZARD COMMUNICATION TRAINING

Hazard communication (HAZCOM) training will be provided for all site personnel. This training complies with the requirements of the OSHA HAZCOM Standard, 29 CFR 1910.1200. This training will be provided upon initial assignment to the site and before the products containing hazardous substances are used. Supplemental HAZCOM training will be scheduled and presented whenever a new hazardous substance is introduced into the work area or an employee changes job location where new products are encountered. The requirements for HAZCOM training are outlined in the HAZCOM SOP 509 presented in Attachment 3 of the APP.

5.8 FIRE EXTINGUISHER TRAINING

All PIKA site personnel will be trained in the general principles of fire extinguisher selection and use, and the hazards associated with incipient-stage fire-fighting (i.e., fighting a fire in its beginning stage). This training will include employee practical application related to the preparation and subsequent use of site-specific fire extinguishers. This training will be provided initially and annually thereafter.

5.9 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

The use of lockout/tagout (LO/TO) devices for the control of hazardous energy is not anticipated for this project.

5.10 PPE TRAINING

Section 6.5 of this SSHP outlines PIKA's PPE training.

5.11 DAILY SAFETY MEETINGS

5.11.1 *Daily Safety Briefing*

Before each day's operations, all PIKA and subcontractor personnel who will work within the exclusion zone (EZ) will be given a safety briefing by the UXOSO. This briefing will identify the anticipated site activities with associated hazards. The briefing will include weather conditions and weather-related hazards; use of safety equipment; emergency notification, evacuation, and medical procedures; accident prevention; relevant WP/SSHP topics; lessons learned; and near misses. Documentation related to the daily safety briefing topics and attendance will be maintained on-site.

5.11.2 *Daily Safety Observer Report*

On a weekly basis, one PIKA employee will be assigned as the Safety Observer. This person will observe the activities for that week and note potential issues of particular concern. Prior to the daily safety briefing at the beginning of the following work week, this individual will present his or her report. They will use the PIKA Daily Safety Observer's Report as a "guide" to present the issues relevant to the prior week's activities.

5.12 WEEKLY SAFETY BRIEFING

Once per week (usually Monday), a weekly safety briefing will be presented in addition to the daily safety briefing. This briefing will consist of information about site hazards or general safety/health issues relevant to the site personnel, presented by the UXOSO or a speaker selected by the UXOSO. All site personnel will attend the training, and the UXOSO will document this training on the PIKA Documentation of Training form (see Attachment 4 of the APP).

5.13 ADDITIONALLY OSHA REQUIRED TRAINING

Additional OSHA-required training as deemed necessary by the CESHM or UXOSO will be provided. The training may be related to specific chemical contaminants or task-specific hazards such as heavy equipment, hand-tool operation, specialized PPE, and the like.

5.14 DOCUMENTATION OF OSHA TRAINING

All on-site personnel are required to provide documentation or certification of training completion before participating in site activities. A copy of all on-site personnel training certificates or documentation will be furnished to the Camp Ravenna Operating Contractor for records of training. Without appropriate documentation, personnel will be prohibited from entering hazardous areas or engaging in hazardous site activities.

6.0 PERSONAL PROTECTIVE EQUIPMENT PROGRAM

6.1 USE OF ENGINEERING CONTROLS

OSHA 1910.120(g), 1910.132, and 1910.134 require that whenever occupational exposures to chemical or physical hazards exist at levels in excess of established action levels, the primary objective will be to apply accepted engineering controls. When engineering controls are not available, a reasonable combination of administrative controls (i.e., written SWPs) and PPE may be used.

6.2 GENERAL REQUIREMENTS

All personnel performing operations on-site will be required to use the level of PPE specified in the AHAs found in Attachment 2 of the APP. Additional information on the selection and use of PPE is presented in SOP 514 (PPE), found in Attachment 3 of the APP. This SSHP makes provisions for use of Level D PPE according to the hazards associated with the SOW tasks. The PPE levels will be reassessed and the PIKA CESHM contacted if any of the following events occur:

- Appearance of previously unidentified chemicals or conditions;
- Changes in ambient weather conditions that impact the use of assigned PPE; or
- Introduction of a new task or change of a previously assigned/evaluated task.

For project tasks assigned after the approval of this SSHP, the PIKA CESHM and the UXOSO will assess the task hazards, assign the appropriate PPE level, complete AHAs, and forward them to the CO/COR. Upon approval, the new form will be incorporated as an attachment to the APP and forwarded to all stakeholders.

6.3 HAZARD-SPECIFIC AND TASK-SPECIFIC PPE SELECTION

Table 4 lists the primary tasks and, when applicable, the subtasks that are anticipated for this project. Next to each planned task/subtask is listed the initial level of PPE to be worn. Modifications to Table 4 may be required and levels of PPE may be changed according to the results of on-site monitoring discussed in Section 8.0 of this SSHP. Revisions to this table will be made only upon approval of the PIKA CESHM. Those tasks/subtasks listed have PPE levels assigned and are detailed in the AHAs. These tasks have conditional specifications listed in the AHAs that will be assessed by the UXOSO prior to startup, with the actual PPE level determined by the UXOSO.

TABLE 4: INITIAL TASK-SPECIFIC PPE ASSIGNMENTS

Task To Be Performed	Initial Level of PPE
Mobilization, site setup, and demobilization	D
Vegetation removal	D/Mod-D*
Surface and near-surface MPPEH Clearance	D
Collect surface and subsurface soil samples	D
MPPEH Inspection certification as MDAS and Disposal	D

(**Based on an on-going hazard assessment conducted by SS and UXOSO*)

6.4 PPE ASSOCIATED WITH VARIOUS PPE LEVELS

6.4.1 *Level D PPE*

The Level D PPE to be used will consist of the following:

- Work clothes or coveralls (cotton);
- Leather work gloves (to be used whenever hands require protection from cuts and abrasions);
- Chemical protective gloves for soil sampling operations;
- Safety-toed work boots;

- Safety glasses;
- ANSI Class II Reflective Vest (when around heavy equipment and vehicular operations); and
- Hearing Protection (required for noise levels > 85dBA).

6.4.2 *Modified Level D*

Level D PPE with the addition of the following:

- Lightweight Tyvek®, (as required for poisonous plants);
- Addition of chaps, face-screen and helmet, for chain saw operations.; and
- Addition of face-screen and helmet for weed-eating operations.

6.5 PPE TRAINING

As specified by 29 CFR 1910.132, all site personnel who are required to use PPE will be given training in the use, care, and limitations of the PPE they are to use. Before PPE use, the affected personnel will demonstrate an understanding of the training and their ability to properly use the assigned PPE. Personnel will be retrained if the level or type of PPE being used changes. PPE training will address the following topics:

- PPE selection decisions and when and what PPE is needed;
- How to properly don, doff, adjust, and wear PPE;
- The limitations of specific pieces/types of PPE; and
- The proper care, maintenance, limitations, and disposal of PPE.

6.6 ACTION LEVELS FOR UP/DOWNGRADING PPE

The PIKA CESHM must give final approval for any upgrading/downgrading of PPE, beyond what is outlined within Table 4, based upon applicable site measurements.

6.7 PPE INSPECTION, MAINTENANCE, AND STORAGE

Site personnel will keep their PPE clean and in good working condition. PIKA will provide cleansing wipes, wash sprays, cloths, towelettes, or equivalent cleaning supplies for the cleaning of PPE. Additionally, PIKA will establish and maintain a designated PPE storage area. All site personnel will be responsible for daily inspections of their PPE, ensuring it is in safe working order. PPE that is worn out or defective will be brought to the attention of the UXOSO. PPE that can be repaired by replacing parts (i.e., replacement of scratched lenses on safety glasses) will be maintained IAW manufacturer instructions or replaced as needed. PPE that cannot be restored to operational condition will be immediately discarded (or tagged out) and replaced as needed.

6.8 EMERGENCY RESPONSE EQUIPMENT

For this project, no additional or special levels of PPE are being specified for emergency situations. For all site operations, approved first aid and emergency response supplies will be available on-site. The site will afford and maintain the following supplies for emergency situations:

- A 16-unit Type III first aid kit will include BBP kits capable of protecting two first aid providers set up with the minimum requirements of USACE EM 385-1-1, which exceed the OSHA-suggested contents.
- Because of hazards associated with the flying debris during vegetation removal operations, a 15-minute ANSI Z358.1 approved eyewash station will be available. [*The emergency eyewash equipment must deliver at least 0.4 gal (1.5 L) of water per minute for fifteen (15) minutes or more (minimum 6 gallons (22.7 L) water)*].
- Personal eyewash bottles will be used to supplement operations conducted away from the above stationary emergency washing station (*No less than two*

bottles will be made available to suffice until personnel reach the emergency eye wash station).

- Burn protection kit with bandages
- Trauma bandages.
- A fire blanket.
- Fire extinguishers (as outlined within Section 15.6.2 of this SSHP).
- A Spill Kit: containing absorbent pads, kitty litter, chemical resistant gloves, applicable tools, and applicable container will be centrally located.

First aid and emergency response supplies will be maintained on-site as illustrated in Table 8 of this SSHP. With the exception of fire extinguishers that require a first year and subsequent monthly inspections, all emergency response and first aid equipment will be inspected initially and then weekly thereafter to ensure adequate supplies and proper operational condition. Each team will have a fire extinguisher in the site vehicle. Additional information related to fire extinguisher types and sizes and spill response equipment that must be available is presented in Section 15.6 of this SSHP.

7.0 MEDICAL SURVEILLANCE PROGRAM

7.1 PURPOSE AND SCOPE

As part of its CESHP, PIKA has established a comprehensive Medical Surveillance Program to assist in the prevention, diagnosis, and treatment of occupational illnesses and injuries sustained during operations on hazardous waste sites. The medical surveillance requirements of this section will apply to all site personnel with potential exposure to significant safety and health hazards.

7.2 GENERAL REQUIREMENTS

Medical examinations of personnel as applicable to the OSHA HAZWOPER standard will be conducted by, or under the supervision of, a licensed physician, who is board-certified in occupational medicine or has had experience in the recognition, evaluation, and treatment of occupational diseases.

7.3 PHYSICIANS STATEMENT

Upon completion of a health assessment, the physician will disclose the results of the examination to the employee, and a written physician's statement will be provided to PIKA. The physician's statement will include, as a minimum, the following: (1) the employee's name and Social Security number; (2) a statement that the employee is qualified to participate in hazardous toxic and radiological waste-related site activities; (3) the physician's recommended limitations on the employee's assigned work, if any; and (4) any supplemental or follow-up examinations or tests the physician believes are required to complete the assessment.

Copies of the general medical clearance forms for the PIKA personnel assigned to this project are provided in Attachment 6 of the APP.

7.4 MEDICAL SURVEILLANCE EXAMINATIONS

(as applicable to the OSHA HAZWOPER standard)

7.4.1 *Pre-Assignment Health Assessment*

The pre-assignment health assessment will be conducted before any worker participates in site activities involving potential exposure to chemical or physical hazards. The pre-assignment health assessment will have been conducted within the past 12 months.

7.4.2 *Supplemental Examination*

Any site worker who has been injured, whose health has been impaired as a result of exposure to site tasks and hazards, developed signs or symptoms from possible overexposure, or received an overexposure will undergo a supplemental examination. The physician will determine the contents of this examination and will certify the employee's fitness to return to work before reassignment. The physician will specify any work restrictions in writing.

7.4.3 *Follow-Up Health Assessments*

The physician will notify PIKA and the employee if a work-related condition is detected that requires additional testing or assessment. Upon conclusion of the follow-up health assessment, the physician will provide a statement regarding the employee's fitness for work.

7.5 EMERGENCY AND NON-EMERGENCY MEDICAL TREATMENT

Prompt and effective non-emergency and emergency medical treatment will be provided for site personnel who require medical attention resulting from injuries or illnesses occurring during site operations. The treatment requirements of this section are not designed to provide for the diagnosis or treatment of non-occupational injuries or illnesses, unless immediate medical attention is needed to

prevent loss of life, relieve suffering, or preclude permanent injury that would result if treatment were delayed. Route maps and instructions to the OSHA physical clinic and the hospital identified in this section are included in Section 15.8 of this SSHP.

7.5.1 *Treatment of Minor Injuries*

For minor injuries, the two on-site PIKA personnel with first aid/CPR training will provide the initial first aid response. If deemed necessary by the UXOSO, for non-emergency first aid treatment, the injured person will discuss the concerns with a nurse associated with PIKA's on-call medical management team (WorkCare).

If it is determined by WorkCare that additional/advanced medical treatment is required, the UXOSO/Competent Person will transport the injured employee to the clinic designated for non-emergency care; treatment for non-emergency injuries/illnesses will be provided by Summa Western Reserve Urgent Care.

If ambulance service is required, the UXOSO will contact Camp Ravenna Range Control security personnel to summon emergency ambulance services. A PIKA representative will meet the ambulance at the main gate and escort it to the accident site. An on-board emergency medical technician (EMT) will provide basic life support (BLS) and other care as required by the nature of the injury. EMT-Is and paramedics will provide advanced life support (ALS).

7.5.2 *Treatment of Serious Injuries*

In the event that the UXOSO requests ALS, the PIKA first aid personnel will provide initial support in an effort to stabilize the injured person until the ambulance service arrives. Once on-site, the EMT-Is and paramedic personnel will not only provide ALS services, but will also decide which hospital the injured party will be transported to, and the mode of transportation. EMT personnel may elect to use ground transportation or summon helicopter air ambulance service for transporting the injured person to a trauma center. Robinson Memorial Hospital in Ravenna, Ohio,

will be the first choice for serious injuries, unless otherwise determined by the medical response personnel.

If ambulance service is required, the UXOSO will contact Camp Ravenna Range Control security personnel to summon emergency ambulance services. A PIKA representative will meet the ambulance at the main gate and escort it to the accident site. An on-board EMT will provide BLS and other care as required by the nature of the injury. EMT-Is and Paramedics will provide ALS.

8.0 SITE AND PERSONNEL MONITORING PLAN

8.1 GENERAL

On-site monitoring will be conducted during site activities to evaluate potential hazards that may be encountered. The on-site monitoring will assist in determining the effectiveness of control measures, the need for changing the PPE requirements, and the effectiveness of SWPs. Direct-reading, real-time instruments will be used whenever possible to detect and quantify site hazards. If a reading exceeds the action levels specified in Table 5, the UXOSO will take steps to correct the situation or minimize the exposure.

8.2 PERSONAL MONITORING REQUIREMENTS

8.2.1 *Real-Time Direct-Reading Monitoring*

Table 5 represents the initial real-time monitoring requirements to be employed during project tasks. Monitoring frequency may be changed by the PIKA CESHM based upon the results of previous monitoring or the detection of factors that indicate a potential for exposure. The monitoring equipment used to assess exposure hazards for this project will include:

1. Sound level meter - Used as a screening device to measure sound power emitted by a source. If the same manufacturer and model of equipment has been characterized previously; under similar working conditions; or if manufactures data is available outlining occupational noise exposure relevant to that equipment; then we may use this information to initially base hazard controls from.
2. Digital ambient air thermometer - Used to assess heat and cold stress effects IAW Section 9.0 of this SSHP.

8.2.2 *Integrated Breathing Zone Sampling*

Integrated breathing zone sampling is not expected for these tasks.

TABLE 5: SITE MONITORING SCHEDULE AND ACTION LEVELS

Hazard	Equipment	Monitoring Frequency/Location	Action Level	Action to be Taken
Heat Stress	Digital Thermometer	Continuous	Based on ongoing operational hazard assessment by UXOSO for personnel in permeable clothing and 70.0°F for workers using impermeable or semi-impermeable clothing	Institute physiological monitoring and appropriate controls as outlined in SOP 506
Cold Stress	Digital Thermometer	Continuous	Below 60.8°F	Institute SOP 507
Noise	Sound Level Meter	Conducted during initial operation of high-noise equipment (not applicable if equipment sound exposure is already characterized through previous monitoring within 6 months or through manufacturer-provided data)	Whenever noise levels in the hearing zone exceed 85 dBA.	Issue suitable hearing protection devices to affected personnel; contact CESHM with approach

8.3 MONITORING SCHEDULE AND FREQUENCY

Table 5 identifies the type of monitoring equipment to be used, the frequency at which the monitoring will be performed, the method to be employed, the action level, and the response if the action level is exceeded. The UXOSO will review the signs and symptoms associated with heat and cold stress as outlined in SOP-506 (Heat Stress Prevention) and 507 (Cold Stress Prevention), as applicable to the environmental conditions at hand.

8.4 TEMPERATURE EXTREME MONITORING

Heat and cold stress monitoring will be conducted IAW the guidelines presented in PIKA SOPs 506 and 507, respectively (Attachment 3 of the APP). This monitoring will be conducted by, or at the direction of, the UXOSO and will be used to minimize physiological effects in the event that temperature extremes are experienced during site operations. The guidance presented in Table 5 will be used by the UXOSO to determine when (e.g., temperature/ongoing assessment) heat and cold stress monitoring will be conducted. The UXOSO will review the signs and symptoms associated with heat and cold stress as outlined in SOP 506 (Heat Stress Prevention) and 507 (Cold Stress Prevention), as applicable to the environmental conditions at-hand.

8.5 NOISE MONITORING PROCEDURES

High noise levels may be experienced during the operation of equipment used for vegetation removal and during sampling operations with the truck/track mounted Geoprobe rig. The noise levels will be monitored (if not otherwise characterized) to determine whether hearing protection devices will be required and to ensure the level of hearing protection being used is adequate. At the start of potential high-noise operations (not otherwise characterized), sound level readings will be taken in the hearing zone of the affected personnel. Noise dosimetry will be considered for any operation where sound level readings indicate a potential for exposures above 85 dBA (based on CESHM and UXOSO assessment).

8.6 MONITORING EQUIPMENT CALIBRATION AND MAINTENANCE

All monitoring instrumentation used on-site will be calibrated and/or response-checked IAW the manufacturer's specifications before and after each use. If an instrument fails to calibrate or respond correctly, the faulty instrument will be removed from service until it is repaired IAW manufacturer's specifications. A back-up unit will be immediately instituted/requested.

9.0 HEAT AND COLD STRESS

PIKA's procedures for the evaluation and control of heat and cold stress are presented in PIKA's heat and cold stress prevention SOPs 506 and 507, respectively (Attachment 3 of the APP). If weather conditions exceed the temperatures/action levels outlined within Table 5, the UXOSO will implement the monitoring and personnel controls outlined in the corresponding SOP.

10.0 SOPS, ENGINEERING CONTROLS, AND WORK PRACTICES

10.1 GENERAL

This section outlines the engineering controls, SWPs, and standing site orders that will be followed by all site personnel to eliminate or reduce the risk of exposure to recognized site hazards. These control measures are presented as a working guide for site personnel and are not intended to cover all PIKA, OSHA, or USACE compliance issues. The PIKA task-specific SOPs and AHAs will be available on-site. Because the SOPs are generic in nature and are intended to compliment this SSHP, many of the SOPs may contain information that may be superfluous to this project. Before and during site operations, the UXOSO and SS will carefully read the SOPs and determine which SOP provisions apply to this project. All site personnel will comply with the following guidelines:

1. The applicable regulatory requirements of 29 CFR 1910 and 29 CFR 1926 will be followed during all site activities.
2. All site personnel will immediately report to the UXOSO any conditions that do not comply with or are not addressed by this SSHP.
3. Site personnel will wear the PPE as specified in Section 6.3 of this SSHP.
4. Any bites or stings received from wildlife will be reported to the UXOSO, who will then determine the appropriate course of action to be taken to treat the bite.
5. Personnel in vegetated or wooded areas will wear long-sleeve shirts with the sleeves rolled down to reduce contact with, and injury from, hazardous or poisonous plants (variations must be approved by CESHM).
6. Site personnel will inform the UXOSO of any known medical conditions that may cause, or result in, an adverse health condition. These conditions include hypersensitive allergic reactions to stinging and biting insects or contact with poisonous plants, diabetes, high blood pressure, skin or eye

sensitivity to sunlight and UV radiation, chronic illness, and acute illnesses such as a cold, the flu, or stomach/intestinal disorders. Persons with known hypersensitive allergic reactions to stinging/biting insects or toxic plants will carry appropriate emergency medical antidotes on their person at all times when on-site.

7. Site personnel will not participate in horseplay or other prohibited acts that could cause harm or injury to site personnel, property, or the environment.

10.2 ENGINEERING CONTROLS

When personnel exposure to site hazards is unavoidable, OSHA regulations specify that engineering controls be used whenever feasible to remove the potential for personnel exposure. During project activities, the engineering controls listed below will be used:

1. All powered hand tools on vegetation removal equipment will be operated with the manufacturer's guards in place.

10.3 SITE RULES / PROHIBITIONS

10.3.1 *Buddy System Procedures*

All work conducted within a work zone will be performed using the buddy system, and at no time will personnel work alone.

10.3.2 *Eating, Drinking, and Smoking Restrictions*

Eating and smoking during on-site operations will be limited to designated areas, at designated break times, and only after personnel have washed their face and hands. At no time will personnel smoke within the EZ; smoking is allowed only in designated areas.

10.3.3 *Standing Site Rules*

To maintain safety and health awareness, a list of standing site rules has been developed that outlines the practices that must be followed at all times. These standing orders will be enforced by the UXOSO, and violators will be subject to disciplinary action. The general standing orders for the site and the Work Zone (WZ) are listed in Tables 6 and 7.

TABLE 6: General Site Rules and Prohibitions

1. Running and horseplay are prohibited in all areas of the site.
2. Ignition of flammable materials in any work area is prohibited, unless approved in writing by the UXOSO.
3. Buddy system procedures will be enforced during all site operations.
4. Only the minimum number of personnel necessary to perform work tasks in a safe and efficient manner will be present in the work area.
5. Site personnel will check in with the UXOSO when leaving and returning to the site.
6. Site personnel will perform only those tasks they are qualified to perform.
7. Site personnel will remain aware of site conditions at all times and will alert the UXOSO to any changes that could pose a hazard to site personnel, the environment, or the public.
8. All site personnel are cautioned not to walk, kneel, or sit on any surface with potential leaks or spills of contamination.
9. Remember, “When in doubt, don't.” Ask questions first.

TABLE 7: Work Zone Rules and Prohibitions

1. No matches, lighters, or spark sources are allowed in any designated WZ.
2. No personnel will enter a designated WZ without authorization from the SS or UXOSO.
3. No eating, drinking, or other hand-to-mouth/face activity will be permitted in a WZ unless proper hygiene has been performed, and then only in designated areas of the WZ.
4. Use of fluids in the WZ will only be allowed after hands and face have been washed or wiped with a disposable towelette.
5. Always have your buddy with you in this zone and follow the buddy system procedures.
6. No personnel will be allowed in the WZ without appropriate training, medical surveillance, and PPE as specified by the SSHP.
7. Remain alert to site conditions and report any changes or unusual occurrences to the UXOSO.
8. Verbal communication will be available at all times between the WZ and off-site emergency resources via Range Control.
9. Remember: site safety and health are everyone's responsibility. Do your part.

10.4 MATERIAL HANDLING PROCEDURES

Site personnel will exercise care in lifting and handling heavy or bulky items. Materials being lifted either mechanically or manually will not be moved or suspended over personnel. Whenever heavy or bulky material is to be moved manually, the size, shape, and weight of the object and the distance and path of movement must be considered to prevent joint and back injuries. The following hierarchy will be followed in selecting a means for material handling:

1. Movement of the material by mechanical device (i.e., lift truck, crane);
2. Movement by manual means using mechanical aid (i.e., dolly or cart); and
3. Movement manually with protective equipment (i.e., lifting belt or lifting monitor).

The lifting fundamentals and requirements are presented in PIKA SOP 522 in Attachment 3 of the APP and within the task AHAs. Those lifting procedures will be followed whenever personnel are required to lift objects. The personal lifting limitation of 50 pounds will be followed at all times.

10.5 BLASTING SAFETY

A Blasting Plan as outlined in EM 385-1-1 Section 29.A is not applicable to the SOW for this project.

10.6 HOT WORK AND FIRE PROTECTION/PREVENTION

10.6.1 *Hot Work Practices*

Hot Work is not anticipated for this project.

10.6.2 *Causes of Fires and Explosions*

Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the conduct of site activities. Potential causes of explosions/fires include the following:

- Ignition of explosive/flammable gases or vapors by external sources;
- Agitation of shock or friction-sensitive compounds;
- Sudden release of materials under pressure; or
- Combustion of grass or brush resulting from contact with the hot exhaust system when site vehicles are parked in dry brushy/grassy areas.

10.6.3 *Fire Prevention*

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment.

The predominant fire concerns related to PIKA's SOW include operation of vehicles and refueling of vegetation removal equipment and vehicles. PIKA's task specific fire prevention controls are listed within each definable task's AHA.

In a general sense, site personnel involved with potentially flammable material or operations will follow the guidelines listed in PIKA SOP 511 Fire Prevention and Protection (in Attachment 3 of the APP) to prevent fires and explosions.

10.6.4 *Fire Protection*

To ensure adequate fire protection, the UXOSO will inspect the site, throughout each day, to ensure that all flammable and combustible materials are safely stored in appropriately configured storage areas and containers. The UXOSO will also ensure that all fire protection controls outlined within each task's AHA have been implemented, no flammable or combustible materials are stored near sources of ignition, and that sources of ignition are removed a safe distance from storage areas. Portable fire extinguishers will be located on-site IAW the requirements in Section 15.6.2 of this SSHP.

10.7 ELECTRICAL SAFETY PROCEDURES

These requirements, as applicable to PIKA's SOW, include, but are not limited to, the following:

- All electrical equipment will carry the Underwriters Laboratories (UL) or Factory Mutual Engineering Corporation seal.
- Flexible cord passing through work areas will be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, or pinching.

- Patched, oil-soaked, worn, or frayed electric cords or cables will not be used.
- Extension cords or cables will not be fastened with staples, hung from nails, or suspended by wire.
- All electrical tools and equipment will be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Semi-portable equipment, floodlights, and work lights will be grounded; and the protective ground will maintained during moving unless supply circuits are de-energized.
- Tools protected by a system of double insulation, or its equivalent, need not be grounded.
- UL listed ground fault circuit interrupters (GFCIs), calibrated to trip within the threshold values of 5 milliamps (ma) $\pm$ 1 ma, are required on all circuits used for portable electric tools.
- Flexible cord sets will be UL listed, contain the number of conductors required for the service plus an equipment ground wire and will be classified as hard usage or extra hard usage (identified by "outdoor" or "WA" printed on the jacket).

PIKA personnel will know and understand the requirements outlined in Section 11 (Electrical) of EM 385-1-1 and Subpart K of the OSHA Construction Standard (29 CFR 1926). The UXOSO will conduct daily audits ensuring practical application of the afore-mentioned requirements (as applicable) through an ongoing operational hazard assessment.

10.8 EXCAVATION AND TRENCHING SAFETY

No excavation or trenching operations fall within this SOW.

10.9 MACHINERY GUARDING

The requirements found in Subpart O of 29 CFR 1910 will be followed to protect site personnel from unguarded moving machinery and equipment. This section has strict application for all maintenance of equipment used for vegetation removal. As applicable to these areas, the general provisions listed below will be followed:

- All reciprocating, rotating, or moving parts of machinery or equipment will be guarded IAW manufacturer's specifications.
- All hot surfaces of equipment will be guarded or insulated to prevent injury and fire.
- No guard, safety appliance, or device will be removed from machinery or equipment or made ineffective except when making repairs, lubrication, or adjustments, and then only after the power has been shut off.
- All guards or safety appliances removed for repair, lubrication, or adjustments will be replaced immediately upon completion of said activity and before the power is restored.

The UXOSO and SS will be familiar with the requirements as outlined in Subpart O of 29 CFR 1910. Through an ongoing hazard assessment, the UXOSO and SS will ensure strict compliance with these regulatory requirements.

10.10 LOCKOUT/TAGOUT

The use of LO/TO devices for the control of hazardous energy is not anticipated for this project. All unserviceable materials and equipment will be tagged out accordingly and restricted from use. An on-going operational hazard assessment will be conducted to identify LO/TO needs. If so identified, PIKA will implement SOP 521 (LO/TO) and amend this SSHP accordingly.

10.11 FALL PROTECTION

Fall protection situations and measures are not expected during this project. If fall protection tasks are identified, procedures will be put in place, Camp Ravenna personnel will be notified, and authorization received before initiation.

10.12 HAZARD COMMUNICATION

To comply with the requirements of the OSHA HAZCOM Standard, 29 CFR 1910.1200, the UXOSO will ensure that all site personnel have received HAZCOM training during the site orientation briefing conducted before initial task assignment. Relevant Material Safety Data Sheet (MSDSs) will be readily available and reviewed by each employee anticipating exposure. All employees will know where to retrieve relevant MSDSs and the procedures for requesting a new MSDS. PIKA subcontractors will also comply with the requirements presented above and will supply the PIKA UXOSO with copies of the MSDSs for any materials brought on-site that contain hazardous substances. The UXOSO will conduct daily audits to ensure that all MSDSs are available to site personnel.

10.13 ILLUMINATION

To control the potential for injury or illness involved with situations where site personnel have limited visibility, PIKA personnel, as a general rule, will conduct on-site operations from 30 minutes after sunrise to 30 minutes before sunset. All office and storage facilities will be supplied with adequate artificial or ambient light to ensure the safe performance of operations.

PIKA does not anticipate lighting concerns associated with this SOW. The UXOSO and SS will be familiar with the applicable lighting requirements outlined in Table 7-1 within Section 7 (Lighting) of EM 385-1-1 and will conduct an ongoing hazard assessment to immediately identify and address any related concerns.

10.14 SANITATION

10.14.1 *Water Supply*

An adequate supply of potable (drinkable) water will be provided on-site at all times and will be supplied IAW the following provisions:

- An adequate supply of potable (drinkable) water will be provided on site in the form of commercial bottled water. When non-potable water is used for sampling activities, UXOSO will confirm that those containers bear labels for clear identification and are stored separately from the potable water.
- Use of non-potable water is not anticipated; however, if containers of such water are used, they will be conspicuously labeled "Caution: water unfit for drinking, washing, or cooking."

Non-potable water will be marked with the following:

ATTENTION
CAUTION - WATER UNSAFE FOR
DRINKING, WASHING, OR COOKING

10.14.2 *Toilet Facilities*

Where a project site is not equipped with sanitary facilities, temporary toilet facilities will be located at the site. Chemical toilets will be used by PIKA to fulfill this requirement. Each temporary toilet will be naturally lighted, have ventilation, be lockable from the inside, and be serviced weekly. The minimum requirements for toilet facilities can be found in the OSHA Standard 29 CFR 1910.120(n).

10.14.3 *Washing Facilities*

Hand and face washing amenities will be used by all personnel prior to eating, drinking, tobacco use, at the completion of each task or before any hand-to-face activities. Given the remoteness of the site and the lack of immediately available

water resources, hand and face wipes will be provided for on-site hand and face washing.

10.14.4 *Site Housekeeping*

All work areas will be maintained in a clean and neat fashion, free of loose debris and scrap. Any materials/equipment not being used will be removed and stored or disposed of accordingly. All work areas will be supplied with trash receptacles that will be secured after each use. The contents of all trash receptacles will either be removed from the site daily or emptied into an on-site central storage container. The storage container, if used, will be tightly closed each night before departure from the site.

10.15 SIGNS AND LABELS

An important element of site safety involves using signs and labels to provide personnel with information related to hazardous operations, areas, and materials. To ensure effective communication of these hazards, the requirements of OSHA 29 CFR 1910.145 will be implemented whenever signs, tags, or labels are used on-site.

As related to PIKA's SOW, the use of signs and barricades is not anticipated. However, the UXOSO and SS will conduct an ongoing operational hazard assessment to determine additional needs as they arise.

10.16 POWER AND HAND TOOL OPERATION

To control the hazards associated with power tool and hand tool operation, personnel will follow the requirements outlined in 29 CFR 1910, Subpart P, 29 CFR 1926, Subpart I, and the SWPs listed in the PIKA Power and Hand Tool SOP 520 (Attachment 3 of the APP).

Limited use of hand and power tools is anticipated during vegetation removal and soil sampling operations.

10.17 BIOLOGICAL/WILDLIFE HAZARDS

During this project site personnel may experience exposure to biological hazards such as stinging insects (bees, wasps and hornets) and biting arthropods such as spiders and ticks. The UXOSO will be responsible for providing briefings and selecting from the Biological Hazards SOP and identifying the requisite controls for any biological hazards identified. Employee awareness and the SWPs outlined in the Biological Hazards SOP 503 will reduce the risk associated with these hazards. PIKA Biological Hazards SOP 503 is located in Attachment 3 of the APP.

Wild animals have been observed on the installation. PIKA personnel will stay clear of all wildlife and immediately report the occurrence to the PM and Camp Ravenna Range Control and allow them to leave on their own. PIKA personnel will inform Range Control if a wild animal becomes trapped and additional measures may be required.

During warm weather conditions when bee, wasps, or hornets, ticks and chiggers are present those personnel with known allergies to stings will maintain an epinephrine auto-injector (provided by their personal physician) in their work area and will notify the UXOSO that they are allergic to stings.

Camp Ravenna is also home to poison ivy and sumac. Barrier creams will be furnished to exposed personnel in tandem with the bleaching of associated equipment.

10.18 USE OF PRODUCTS CONTAINING HAZARDOUS MATERIALS

Potential for airborne exposure to the hazardous materials present on-site is **not** anticipated. However, some products to be used have the potential for skin contact hazards. To help ensure personnel safety from hazardous materials, PIKA personnel will follow the SWPs listed below:

- All site personnel who use hazardous materials will review the SDS for each product used.
- All products with airborne exposure hazards (e.g., gasoline and other fuels, spray paints) will be used outdoors or in well-ventilated areas. Personnel will stand upwind when dispensing the product.
- Personnel will utilize protective gloves when using or dispensing a product with a skin contact hazard.
- Only those personnel who have received appropriate HAZCOM training, as outlined in Section 5.7 of this SSHP, will use a product containing hazardous materials.
- Personnel will immediately wash any affected skin that accidentally comes in contact with a hazardous material identified as being a skin contact hazard.

10.19 DAILY AND WEEKLY SAFETY INSPECTIONS

The UXOSO will conduct daily inspections and weekly audits using the Daily/Weekly Safety Inspection and Audit Form 506 and will communicate the results to the SS. The form will be maintained at the site; at the conclusion of the weekly audit, a courtesy copy will be forwarded to the CESHM for review. The transmittal may take the form of email and shall outline the following:

- Synopsis of site activities;
- Ongoing safety and health deficiencies/concerns;
- Upcoming site activities; and
- Upcoming safety and health concerns.

Additionally, any daily checklist with deficiencies noted will also be forwarded to the CESHM. Once a deficiency has been corrected, the UXOSO will notify the CESHM of the resolution. It is imperative that for each deficiency noted, there is

documentation (both on the inspection/audit form and the Daily Safety Log) of the remedial actions taken to correct the deficiency.

10.20 PERIODIC CORPORATE SAFETY AND HEALTH INSPECTIONS

During the course of site operations, the PM will conduct regular site inspections. The PM will generate an inspection report detailing the parameters of the inspection with observations and findings. A copy of this report will be distributed to the on-site team for review and action. Deficiencies noted on the inspection report will be logged and tracked until mitigated/abated.

11.0 SITE CONTROL

11.1 CENTER OF OPERATIONS

In the event of an accident involving the total evacuation of site personnel, PIKA personnel will evacuate to the primary or secondary rally point (as applicable), are assigned during each morning's safety brief. The UXOSO will conduct a head count ensuring 100% accounting of all personnel. Follow-on direction will be given by the SS.

11.2 SECURITY PROCEDURES

The names of the PIKA and subcontractor personnel working onsite and vehicle information will be provided to Camp Ravenna personnel a minimum of 48 hours in advance of the beginning of field work, not including weekends and/or holidays, in order to be added to the access roster to permit entrance to the facility. All personnel, upon entry, will need proper identification and vehicle information is required. Personnel will check in with Camp Ravenna Range Control upon entering and departing Camp Ravenna.

11.3 SITE MAPS

Before site activities begin, a site map will be available that will detail the following information: site size, restricted areas, designated assembly points, the site access routes, staging areas, and any other information deemed necessary by the SS or UXOSO. The site map will be used by the UXOSO during the site safety training and the daily safety briefings. Maps of the project site are included in Appendix B of the WP.

11.4 SITE COMMUNICATIONS

Effective on-site and off-site communication is an integral part of site control and will be established before site activities begin. On-site communication will be used

to coordinate site operations, maintain site control, pass along safety information, coordinate work/rest periods, and alert site personnel to emergency situations. Means of communicating with Camp Ravenna Range Control personnel to contact off-site resources will be available at all times to ensure effective communication with off-site management personnel and emergency response services. All site personnel will be familiar with the different methods of both on-site and off-site communication. The methods PIKA will use for on and off-site communication will include:

1. On-site communications consisting of portable radios, as well as air horns, bullhorns, sirens or hand signals as needed for communications.
2. Off-site communications will be accomplished using cellular telephones. Because cell phone coverage can be inconsistent, each team will have two means of communication for summoning off-site support via Range Control.

11.5 BUDDY SYSTEM

An important element in controlling personnel exposure to site hazards is the implementation of buddy system procedures. These procedures ensure that no site personnel are allowed to work without another qualified worker present to provide assistance. At all times buddies should:

1. Observe their buddy for signs of exposure to site hazards or stresses.
2. Observe the site area in which they are working for hazards.
3. Remain within verbal or visual contact with their buddy at all times.
4. Notify the SS and/or UXOSO if emergency assistance is needed.

12.0 PERSONNEL/EQUIPMENT DECONTAMINATION AND HYGIENE

12.1 PERSONNEL HYGIENE AND DECONTAMINATION

Personal hygiene and sanitation facilities will be established on-site IAW 29 CFR 1910.120(n) to ensure personnel maintain good personal hygiene. These facilities will include personal washing amenities and toilet facilities as listed in Section 10.0 of this SSHP..

12.1.1 *Level D Decontamination*

No hazardous chemical decontamination procedures will be required for the Level D PPE. All PPE will be maintained and cleaned IAW the requirements of Section 6.7.

12.1.2 *Modified Level D*

Modified Level-D PPE will be used in association with vegetation clearance activities. Careful notice to remnants of poisonous plants must be exercised and immediately addressed with an IVY cleanser, so as not to cross contaminate personnel and/or equipment.

Specific PPE components may vary based on personnel exposures (as per an on-going operational exposure assessment), Site-specific procedures for donning/doffing PPE will be assessed and defined by the UXOSO before related activities commence. Garments chosen will meet the minimum PPE requirements outlined in Table-4 and made more aggressive, as deemed necessary, based on an on-going operational exposure assessment conducted by the UXOSO. Once all aspects have been defined, the UXOSO will conduct training on the site-specific application prior to initiating project tasks; this training will take place as part of the daily safety briefing(s). The details discussed, including list of attendees, will be

recorded on the Daily Task and Safety Briefing Log – Form 502. A copy of Form 502 is provided in Attachment 4.

12.2 EQUIPMENT HYGIENE

Equipment used in the field, including PPE, will be cleaned and inspected at the end of each workday IAW the requirements of Section 13.0 of this SSHP.

13.0 EQUIPMENT DECONTAMINATION

Equipment used in the field will be cleaned weekly, with these exceptions:

- Equipment used for the removal of poison ivy or sumac will be decontaminated with poison ivy/sumac cleaner before being placed back in vehicles or stored.

In the event that any equipment is found to be defective, it will be brought to the attention of the SS or UXOSO immediately. All environmental sampling equipment will be decontaminated IAW the requirements of the RVAAP Facility Sampling and Analysis Plan.

14.0 EMERGENCY EQUIPMENT AND FIRST AID

For this project, no additional or special levels of PPE are being specified for emergency situations. For all site operations, approved first aid and emergency response supplies will be available on-site. Each field team that functions away from the PIKA Ravenna, Ohio field office will have and maintain first aid supplies consisting of:

- A 16-Unit Type III first aid kit will include BBP kits capable of protecting two first aid providers set up with the minimum requirements of USACE EM 385-1-1, which exceeds the required OSHA suggested contents.
- Due to hazards associated with the flying debris during vegetation removal operations, a 15-minute ANSI Z358.1 approved eye wash station will be available. [*The emergency eyewash equipment must deliver at least 0.4 gal (1.5 L) of water per minute for fifteen (15) minutes or more (minimum 6 gallons (22.7 L) water)*].
- Personal eyewash bottles will be used to supplement operations conducted away from the above stationary emergency washing station (*No less than two bottles will be made available to suffice until personnel reach the emergency eye wash station*).
- Burn protection kit with bandages.
- Trauma bandages.
- A fire blanket.
- Fire extinguishers will be available as outlined within Section 15.6.2 of this SSHP.
- A spill kit containing absorbent pads, kitty litter, chemical-resistant gloves, applicable tools, and applicable container will be centrally located.

First aid and emergency response supplies will be maintained on-site as illustrated by Table 8 of this SSHP. With the exception of fire extinguishers that require a

yearly and subsequent monthly inspection, all emergency response and first aid equipment will be inspected initially and then weekly thereafter to ensure adequate supplies and proper operational condition. Each team will have a fire extinguisher in the site vehicle and additional fire extinguishers will be available at fuel storage areas (as applicable). Additional information related to fire extinguisher types and sizes and spill response equipment that must be available is presented in Section 15.6 of this SSHP.

TABLE 8: EMERGENCY EQUIPMENT REQUIREMENTS

Emergency Equipment	No. Per Location	Area Where Item(s) Will Be Stored	Operation Requiring Specified Equipment
First aid/burn kit/burn blanket/trauma bandages/CPR mask	1 ea.	Centralized location	All operations
Portable Eyewash kit	2 ea.	For vegetation removal team	Operations removed from Emergency Eyewash at a centralized location.
15- minute eyewash	1 ea.	Centralized location	All operations
Biohazard kit	2 ea.	Centralized location	All operations
Air horn	1 ea.	Centralized location	All operations
Spill containment/ cleanup supplies (absorbent pads/kitty litter/chemical-resistant gloves/applicable tools/applicable container)	1ea	Centralized location	Operations involving hazardous materials (e.g. fuels, oils etc.)
Fire extinguisher	1 ea.	Each team, vehicle, and soil sampling/ vegetation removal work zone	All operations

15.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

15.1 INTRODUCTION

PIKA recognizes that thorough planning, proper design, and implementation of the required emergency response contingencies can dramatically reduce the frequency and severity of emergencies. If an emergency does occur, quick decisive action will be required as even short delays can create or escalate life-threatening situations. To ensure rapid, effective response to a site emergency, the procedures and contingency plans outlined in this section will be implemented before and during the conduct of any site activities involving exposure to safety and health hazards.

15.2 PRE-EMERGENCY PLANNING

Before the start of site operations, PIKA will contact and meet with local authorities, informing them of the activities being performed under this SSHP and the potential hazards that these activities pose to site personnel, the environment, and the public. The SS and UXOSO will confirm information with the local authorities related to the type of emergency services available, including any contact phone numbers or procedures needed to summon emergency services. The UXOSO will be responsible for ensuring that the telephone numbers and procedures for contacting local emergency services are posted IAW the requirements of this section.

15.2.1 *Identification of Potential Emergencies*

During the development of this SSHP, potential safety and health hazards associated with the planned site activities were identified. These hazards were assessed to determine the nature and type of emergencies that could arise. Contingency plans for responding to the potential emergencies have been developed and are included in this section. The potential emergencies that may result during the conduct of site activities are:

1. Injury or illness associated with physical or biological hazards,

2. Fire,
3. Inclement weather, and
4. Spill of hazardous materials [small quantities (< 5 gallons) of fuel or oil].

15.2.2 *Identification/Coordination of Emergency Services*

The SS, UXOSO and all site employees will conduct an ongoing operational hazard assessment to stay pro-active at preventing emergency situations. If at any time an emergency situation is identified, three blasts of the emergency air horn will be sounded and immediate action will be taken to assess the emergency and render required assistance. The SS and/or UXOSO will fill the initial role as the on-site emergency response coordinator. The reporting procedures are defined in subsection 15.2.3 below.

Before the initiation of site activities, the UXOSO will contact local emergency services to verify their availability and to confirm the means of summoning emergency services. It will be the responsibility of the SS to ensure that off-site communications (via Camp Ravenna Range Control security) are available at all times. Site operations will not be conducted unless means of off-site communications are established. The telephone numbers for all emergency services and contacts are presented in this plan and will be available at a centralized location on-site and in all site vehicles. All site personnel will be aware of the procedures for obtaining off-site emergency services.

15.2.3 *Initial Incident Reporting Procedures*

Once an emergency has occurred, the UXOSO or SS will sound the air horn alarm (three blasts). This will initiate site evacuation and mobilization of PIKA first aid/CPR response personnel. Once informed of the emergency, the SS will notify Camp Ravenna Range Control and then will ensure that all personnel (e.g. subcontractors) are aware of the situation and are involved in the proper response procedures.

15.3 PERSONNEL ROLES, AUTHORITY AND COMMUNICATIONS

15.3.1 *SS*

Upon notification of an emergency situation, the SS will assume the role of the Emergency Coordinator (EC). As the EC, the SS will have overall responsibility for coordinating the efforts of the PIKA on-site response actions, as well as the off-site emergency response agencies. Additionally, the SS will ensure that required off-site emergency services have been summoned and will also be responsible for notifying and coordinating all relevant federal, state, and local regulatory and response agencies. The SS/EC will be assisted by the UXOSO.

15.3.2 *UXOSO*

During an emergency situation, the UXOSO will have specific duties that are assigned by virtue of the need to maintain separation of safety and health from operations. However, as appropriate, the UXOSO will assist the SS/EC during response actions. In the event that the SS is incapacitated, the UXOSO will assume the duties of the SS/EC.

15.3.3 *On-Site Emergency Response Personnel*

During site activities, PIKA personnel will act, to the greatest extent possible, in the role of on-site emergency response personnel. The PIKA SS will designate the personnel assigned to emergency response tasks before initiation of site activities involving the potential for an on-site emergency. PIKA on-site emergency response personnel will receive training in the response actions that they will be authorized to, and may be directed to, perform during a site emergency.

15.3.4 *Off-Site Emergency Response Services*

The off-site emergency resources presented in Table 9 will be contacted by the EC in the event of an emergency.

TABLE 9 - EMERGENCY TELEPHONE NUMBERS

CONTACT CAMP RAVENNA RANGE CONTROL BY RADIO COMMUNICATION OR BY PHONE AT 614-336-6041 FOR ALL EMERGENCY NOTIFICATIONS

(The numbers listed below are for information only)

Service / Contact	Agency / Position	Telephone Number
Land or Air Ambulance	Ravenna City Fire Department Ravenna, OH	330-297-5738
Emergency Hospital Care	Robinson Memorial Hospital 6847 N Chestnut Street Ravenna, OH 44266	330-297-0811
WorkCare	Medical Management Subcontractor	1-888-449-7787
Occupational Health Clinic	Summa Western Reserve Urgent Care 3913 Darrow Rd, Suite #100 Stow, OH, 44224	330-688-7900
Police	Portage County Sheriff Office	330-296-5100 or 330-325-1023
Police	Trumbull County Sheriff Office	330-675-2508
Ravenna City Fire Dept	Ravenna, OH	911 Operator or 330-296-5783
Closest Military EOD Unit	731st Ordnance Company (EOD), Wright Patterson Air Force Base, OH	937-257-0436 or 937-257-0664
Christopher Brackett	USACE Contracting Officer	Office: 502-315-6209
Jay Trumble	USACE Contracting Officer's Representative	Office: 502-315-6349
Richard Callahan	PIKA Project Manager	Cellular 330-352-4822
Kathleen Anthony	PIKA Program Manager	Office – 916-920-9146 Cellular – 713-724-2893
Sarosh Manekshaw, CSP	PIKA Corporate Safety and Health Manager	Cellular 713-412-9948
Margaret Carte	PIKA SS	Cellular 281-714-0905

Service / Contact	Agency / Position	Telephone Number
Cameron Wenzel	PIKA UXOSO	Cellular 281-543-3316

15.3.5 *Communications*

Emergency communications will be available and maintained during all on-site operations. Radio and cellular phone communications will be used between the field teams and the SS. The SS will have radio and cellular phone contact with security personnel at Range Control, as well as the PIKA PM. In the event of an emergency, Range Control will be contacted to summon off-site emergency services.

15.4 POSTED INSTRUCTIONS AND EMERGENCY CONTACTS

Evacuation routes, assembly points, emergency and site control procedures, WorkCare occupational health clinic, hospital routes, and emergency numbers will be discussed each day at the daily safety briefing to ensure all site personnel are familiar with this information. A route map to the WorkCare approved occupational clinic, and the hospital and the list of emergency contacts presented in Table 9 will be posted in a Safety Binder located in a centralized location on-site and within all site vehicle glove compartments. All site personnel will be familiar with the location of these lists and maps; and they will be made aware of the location of the closest telephone and/or radio communications.

All federal and state required job safety postings will be briefed and available within the on-site, centrally located Safety Binder also.

15.4.1 *Emergency Fire Recognition and Prevention*

15.4.1.1 Small Fires

A small fire is defined as one fire that can be extinguished with a 4A:20 B:C fire extinguisher. In the event of a small fire, site personnel will take the following actions:

- The SS and UXOSO will be notified immediately of the occurrence of the fire by PIKA site personnel.
- All unnecessary personnel will be evacuated to an upwind location.
- Under the initial direction of the PIKA UXOSO, as directed by the SS, PIKA personnel will extinguish the fire from an upwind location.
- The SS will request emergency response assistance (ambulance, fire, police) as needed for any injuries or exposures to smoke or other hazardous chemicals via Range Control.
- No fire will be fought where the fire is in imminent danger of contact with explosives. All persons will be moved to a safe area and the fire area guarded against intruders.
- After the fire is extinguished, an investigation will be initiated to determine the cause of the fire and to identify any operational changes that may be required to prevent future fires.
- Fire extinguishers will be in a fully charged and operable condition and will be suitably placed, distinctly marked, and readily accessible.

15.4.1.2 Large Fires

In the event that a large fire occurs, or if a small fire cannot be extinguished and develops into a large fire, the following actions will be taken:

- PIKA site personnel will immediately notify the SS and UXOSO.
- All unnecessary personnel will be evacuated to an upwind assembly point.
- The SS will summon the local fire department and any other emergency response services (police, ambulance, and hospital) as needed for the treatment of injuries or exposures via Range Control.

- To the extent that it can be safely accomplished, the SS will direct site personnel to move vital equipment/supplies from the fire's path.
- To the safest extent possible, and with available resources, PIKA personnel will mitigate the spread of the fire from an upwind location (personnel will not conduct fire-fighting duties beyond what their training and experience permits).
- At no time will attempts be made to extinguish a fire involving explosives, and all personnel will evacuate the site if the fire involves explosives.
- After the fire is extinguished, an investigation will be initiated to determine the cause of the fire and to identify any operational changes that may be required to prevent future fires.

15.4.2 *Inclement Weather*

In the event of inclement weather, it may be necessary to cease site operations and evacuate the site. The UXOSO will be responsible for obtaining the local weather conditions on a daily basis and advising the SS of the forecast. If necessary, the weather service will be contacted on a more frequent basis. If inclement weather occurs, the procedures outlined below will be followed until the inclement weather passes.

- **Heavy precipitation**: In the event that heavy precipitation is imminent or occurs suddenly, site operations may have to be halted if, in the opinion of the UXOSO, it would cause unsafe conditions. If so determined, equipment will be secured, and site personnel will retreat to shelter. The determination to restart operations will be the responsibility of the SS, who will consult with the UXOSO to ensure site conditions are safe for re-entry and continuation of operations.
- **Thunderstorms**: Thunderstorms, with their associated lightning, present a significant hazard to site personnel. A severe thunderstorm watch announcement indicates that a severe thunderstorm is possible. A severe

thunderstorm warning signifies that a severe thunderstorm has been sighted, or detected by radar, and may be approaching. Work may continue at the work site during severe thunderstorm watches; however, site work will cease and the EZ will be evacuated during a severe thunderstorm warning for the site area. Activities will not resume until 30 minutes have passed since the last observed lightning flash or clap of thunder heard.

- **High winds**: High winds can create conditions that threaten the safety and health of site personnel. If the UXOSO determines that the wind levels on-site present a hazard to site personnel, site operations will be halted and site personnel will assemble at the site vehicles. If wind levels are high enough, the UXOSO may even require the evacuation of the entire site until such time as conditions improve; in this instance, personnel will rally at designated location established during mobilization. The determination to restart operations will be the responsibility of the SS in consultation with the UXOSO to ensure site conditions are safe for re-entry and continuation of operations.

15.5 CRITERIA AND PROCEDURES FOR SITE EVACUATION

15.5.1 *Emergency Alerting Procedures*

It will be the responsibility of the SS to ensure that off-site communications are available at all times. Site operations will not be conducted unless off-site communications are established. The telephone numbers for all emergency services and contacts are listed in Table 9. The emergency phone numbers will be posted in the Safety Binder in a centralized location on-site and within the glove compartment of site vehicles; all site personnel will be aware of the procedures for obtaining off-site emergency services.

The SS will have radio and cellular phone contact with security personnel at Range Control, as well as the PIKA PM. In the event of an emergency, Range Control will be contacted to summon off-site emergency services.

15.5.2 *Employee Alarm System*

To alert on-site personnel, the UXOSO will have an air horn that will be sounded to inform personnel, in the immediate area, of an emergency. The effectiveness of the air horn will be tested during the initiation of site activities to ensure that all site personnel can clearly hear the alarm above operational noise levels. If operational noise levels prevent site personnel from hearing the air horn alarm, other means of notification will be used.

To alert personnel of the occurrence of an emergency, three long blasts off the air horn will be the signal to evacuate the site immediately. The initial assembly point will be located in a safe area as identified during the daily safety briefing each morning. Once personnel are assembled, the UXOSO will conduct a head count of all site personnel. Once all personnel are accounted for, the UXOSO will inform the SS and await further direction, which may include further evacuation from the site, emergency response instructions, or any other guidance deemed necessary by the SS.

15.5.3 *Evacuation Routes and Assembly Points*

Before the initiation of site operations, the UXOSO and the SS, will identify the evacuation routes and assembly points for the various areas of the site. These routes and assembly points will be marked on the site map and communicated each morning to site personnel during the daily safety briefing.

15.5.4 *Site Security and Control During Emergencies*

During an emergency, site security and control are paramount to managing the effects of the emergency. Upon notification of an emergency, the project team will establish personnel accountability and evacuate to the pre-determined emergency assembly point. Once the team has evacuated to the assembly point, the UXOSO will maintain control over site personnel until further guidance is given by the SS.

PIKA personnel, as directed to do so by the SS, will initially conduct site access control and security. If PIKA personnel are needed for other response actions, the SS will request assistance from the Camp Ravenna Range Control, who will then be responsible for requesting security and access control services from the local police department.

15.6 EMERGENCY PPE AND EQUIPMENT

15.6.1 *General Requirements*

The emergency equipment listed in Table 8 will be on-site, stored in the location indicated, and available for use during the operation specified. Emergency equipment assigned to the site/team will be maintained in proper working order and staged near the operational area as directed by the SS. The UXOSO will conduct an inspection of all emergency equipment, at least weekly, to ensure completeness and proper working order.

15.6.2 *Portable Fire Extinguishers*

Fire extinguishers will be stored in well-marked locations where they can be readily accessed and protected from damaging environmental elements. The UXOSO will ensure that all fire extinguishers have a yearly inspection conducted by a qualified agency and visually inspected monthly by a competent site employee; inspections must be documented. All site personnel will be advised of the location and operation of fire extinguishers and will be informed of the procedures to be followed in the event of a fire. Emergency procedures for small and large fires and explosions are found in subsection 15.4.1. Fire extinguisher requirements and storage locations are as follows:

- All vehicles will be equipped with a fire extinguisher of not less than 10B units.

- Support locations will be equipped with a fire extinguisher of not less than 10B units.
- At least one portable Fire Extinguisher rated 20-B:C shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids (as applicable).
- Flammable/combustible liquid storage shall have at least one 40B:C fire extinguisher located within 7.5 to 23 meters (25 to 75 feet) of the storage area (as applicable).

15.6.3 *First Aid Kit Requirements*

To ensure adequate first aid supplies are available, a 16-unit Type III first aid kit will be provided with two BBP kits capable of protecting two first aid providers. The first aid kit will be set up with the minimum requirements outlined in USACE EM 385-1-1, which exceeds the required OSHA suggested contents. The unit will be located in a centralized location for personnel support.

The first aid supplies listed in Table 8 have been assessed and deemed appropriate for this SOW and compliant with regulatory requirements.

15.6.4 *Eye Washes*

Given the hazards associated with the vegetation removal operations, a 15-minute ANSI Z358.1 approved eye wash station will be available. [The emergency eyewash equipment must deliver at least 0.4 gal (1.5 L) of water per minute for 15 minutes or more (minimum 6 gallons (22.7 L) water).]

Additionally, personal eyewash bottles will be used to supplement emergency washing station staged at a centralized location (No less than two bottles will be made available to suffice until personnel reach the emergency eye wash station)

15.6.5 Spill Kit

A portable spill response kit containing absorbent pads, kitty litter, chemical-resistant gloves, applicable tools, applicable container, and other needed supplies identified during the on-site *Operational Risk Assessment,* will be maintained in a readily accessible location. Upon notification of a spill, the UXOSO, or a party designated by the UXOSO, will transport this kit (or its components) to the spill site for use.

15.7 DECONTAMINATION AND TREATMENT OF INJURED PERSONNEL

15.7.1 *General*

The chemical hazards associated with this SOW are limited, and no specific chemical washes/rinses will be necessary during emergency decontamination.

The exact site-specific procedure for decontamination and treatment of injured personnel will be assessed and defined by the UXOSO as applicable to each scenario; considering the condition of the victim, the site conditions and type of protective garments being worn.

15.7.2 *Assessing the Emergency*

A key element to the successful treatment of an injured worker is the effective assessment of the emergency prior to the initiation of action. If on-site PIKA or off-site emergency personnel are to enter the site in response to the emergency, the SS will assess the incident to identify and record vital information about the site and situation. This data will be passed on to response personnel and will include, to the extent possible, the items listed below:

- What happened (i.e., type of incident, cause of incident, the time the incident occurred, extent of chemical release, including route of migration, and extent of damage to structures, equipment, and terrain);
- Where on the project site the incident has occurred;
- Personnel/casualties involved, such as number, location, and condition of victims, treatment that may be required and missing personnel;
- What could happen from this point (i.e., potential for fire or explosion, coupled with release of hazardous materials, location of all personnel in relation to hazardous areas, and potential for emergency affecting the general public or the environment); and
- Steps needed to resolve the situation such as equipment and personnel needed for rescue and hazard mitigation, number of uninjured personnel available for response, resources available on-site, resources available from off-site response groups and agencies; time needed for off-site response resources to reach the site, and hazards involved in rescue and response.

15.7.3 *Rescue and Response Actions*

At no time will site personnel attempt an emergency response or rescue until the situation has been assessed and the appropriate response outlined by the SS or UXOSO. Camp Ravenna Range Control must be notified immediately upon recognition of emergencies. Ensuring that the incident has been properly assessed and that the appropriate actions have been selected will ensure that further injuries do not occur as a result of poor response planning. Based on the information collected during the emergency assessment, the SS or UXOSO will select the relevant response and rescue actions that will be taken. The rescue actions that may be needed are listed below, with some actions possibly being performed concurrently and some of the actions not being required:

- Evacuate personnel to a safe location upwind of the incident.
- Enforce the buddy system and allow no one to enter the site unattended.

- Survey casualties to locate all victims, assess their condition, and determine the resources needed for casualty stabilization and transportation.
- Assess existing and potential hazards and decide whether and how to respond.
- Request aid by contacting the required off-site personnel or facilities, such as ambulance, fire department, or police, via Post #1.
- Allocate personnel and equipment to rescue and initiate incident response operations.
- Control the situation and use measures to prevent the situation from migrating further.
- Assign PPE IAW the nature and type of emergency.
- Extricate victims and assist them from the area.
- Decontaminate personnel, if necessary, by removing outer clothing only if this can be done without causing further danger or damage to the affected personnel.
- Stabilize injured personnel and administer any medical procedures that are necessary before the victims can be moved.
- Transport the affected personnel via the predetermined mode as applicable to their injury.
- Record personnel involved in the incident, the time it occurred, and the destination and condition of the casualty at the time of transport.
- Record disposition, condition, and location of all personnel affected by the emergency.

15.7.4 *Treatment of Injured/Ill Personnel*

In the event of an emergency involving personal injury or illness, an immediate, appropriate response will be the key to preventing further injury/illness and

providing comfort to the affected party. If any site personnel are injured or overcome by illness, the applicable procedures listed below will be followed:

- Upon notification of the occurrence and the nature of the injury/illness, the SS and the UXOSO will respond to the location where the injury/illness has occurred; Camp Ravenna Range Control will be notified.
- The severity of the injury/illness will be assessed, the required first aid support will be provided, and the SS or UXOSO will initiate the procedures needed to ensure rapid, efficient transportation of the affected person to appropriate medical support (if required).
- If immediate transportation to a medical facility is required, the SS will immediately request emergency services via Camp Ravenna Range Control. If deemed necessary by the emergency service operator, an air ambulance may be summoned to transport the affected party.
- Any life-threatening injuries beyond minor first aid mitigation will require summoning emergency medical service (EMS). The injury will be described to facilitate the determination as to whether BLS or ALS is needed. The UXOSO or designated representative may transport (along with the first aid provider) injured personnel with minor injuries (any non-life-threatening injury beyond standard first aid) to the designated medical facility; however if any doubt over the severity of the injury exists, the EMS will be summoned.

15.7.5 *Post-Emergency Follow-Up*

Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. It is also imperative that all federal and local regulatory agencies be notified of the emergency, as necessary. Therefore, the following activities must be conducted before restart of site activities:

- Notify all appropriate governmental agencies as required (i.e., OSHA must be notified if there have been any fatalities or three or more personnel hospitalized).
- Restock and clean all equipment and supplies used or damaged in the emergency.
- The PIKA PM, CESHM, SS and UXOSO will conduct an accident investigation to determine the cause of the emergency and what preventative measures can be taken to ensure the emergency does not occur again.
- The PIKA PM, and CESHM, SS, and UXOSO will conduct an emergency response critique to assess the effectiveness of the emergency response procedures and to identify any areas requiring improvement.
- Will complete the PIKA and Camp Ravenna required accident forms.
- Will review and revise, as needed, the site operational and emergency response procedures and, if necessary, update the SSHP to reflect the new procedures.

15.7.6 *Documentation*

Documentation related to the emergency will be recorded in a legible, accurate, and complete fashion. Documentation will be recorded as soon as possible (within 24 hours or sooner) after the emergency to ensure it is recorded while the events are vivid in the minds of the personnel involved. The information recorded will include:

- A listing of the on-site personnel involved, site personnel who responded, personnel in charge, and off-site groups or agencies that responded;
- A chronological record of events;
- A listing of the actions taken to minimize the effects of or mitigate the emergency;
- The results from any air monitoring conducted during the emergency and, if applicable, results of environmental samples;

- An assessment of the potential exposures received by site personnel and the surrounding public;
- A recording of the injuries or illnesses that occurred as a result of the emergency.

15.8 ROUTE MAPS TO MEDICAL TREATMENT FACILITY

15.8.1 *General Instructions*

During the daily safety briefing, the UXOSO will review the instructions for obtaining medical attention and transporting site personnel to the hospital. All site vehicles will be provided with copies of the site map, emergency contacts, and the hospital strip-maps provided in Section 15.8.2 (documents will be placed in glove compartment of vehicles).

For non-emergency injuries/illnesses, the PIKA CESHM/HR will be notified and the WorkCare nursing staff contacted for injury/illness management.

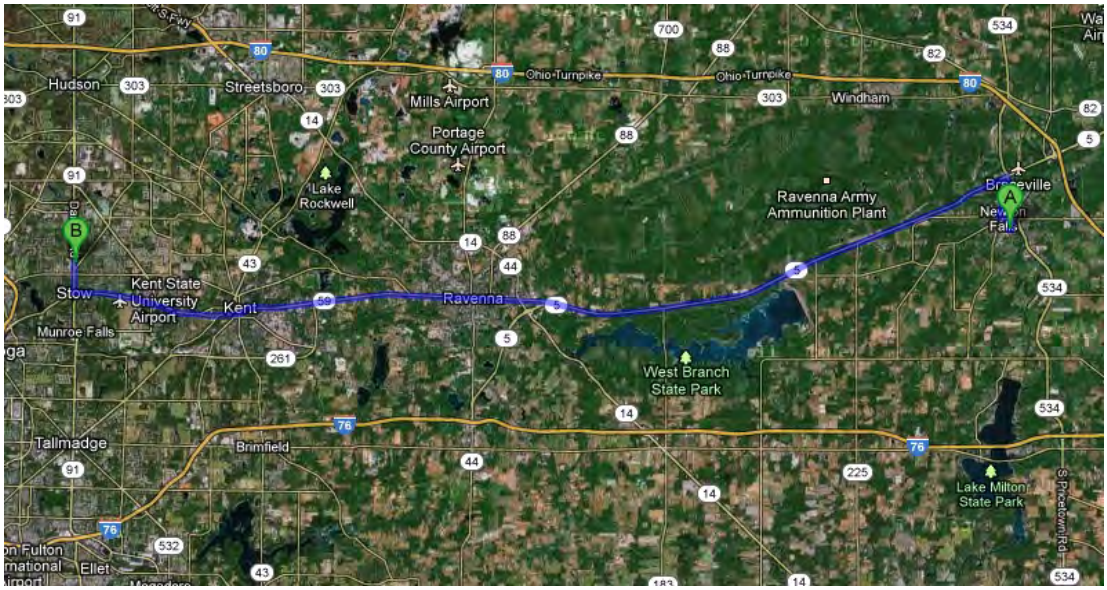
If ambulance service is required, the UXOSO will contact Camp Ravenna Range Control security personnel to summon emergency ambulance services. A PIKA representative will meet the ambulance at the main gate and escort it to the accident site. An on-board EMT will provide BLS and other care as required by the nature of the injury. EMT-Is and Paramedics will provide ALS.

15.8.2 *Directions to the Designated Medical Facilities*

15.8.2.1 Urgent Care Clinic (non-emergency)

Site personnel requiring non-emergency first aid treatment, as deemed necessary by the UXOSO, will be taken to Urgent Care at the Summa Western Reserve Hospital.

Figure 2
Non-Emergency Clinic Map and Directions
Tel: (330) 688-7900
Summa Western Reserve Urgent Care
3913 Darrow Rd Suite 100, Stow, OH 44244
Est. Time: 40 min **Total Miles:** 20.5

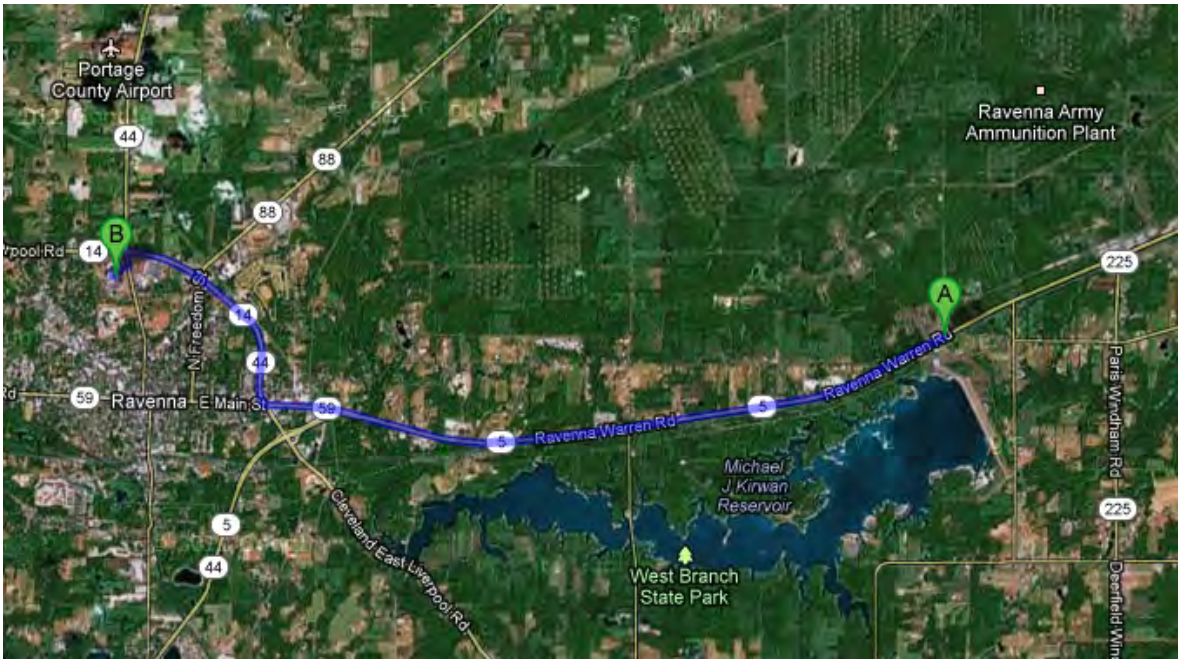


Instruction	For
Depart main gate to exit site on SR-5 [Ravenna Warren Rd] (West)	6.3 mi
Stay Straight to go onto OH-59	12.4 mi
Turn right onto Darrow Rd / OH-91	0.8 mi
Arrive at Med Group: 3913 Darrow Rd #100, Stow, OH 44244, Tel: (330) 688-7900	

15.8.2.2 Hospital for Emergencies

Site personnel requiring care beyond first aid will be transported by ambulance or other means to the Robinson Memorial Hospital, as shown in Figure 3.

FIGURE 3
EMERGENCY HOSPITAL MAP AND DIRECTIONS
Robinson Memorial Hospital
Tel: (330) 297-0811
6847 N Chestnut Street, Ravenna, OH
Est. Time: 11 min **Total Miles:** 9.06



Instruction	For
Depart Main Gate to Exit Site on SR-5 [Ravenna Warren Rd] (West)	6.5 mi
Turn RIGHT (North) onto SR-14	2.38 mi
Turn LEFT (South) onto (N) Chestnut St	0.18 mi
Arrive Robinson Memorial Hospital; 6847 N Chestnut Street, Ravenna, OH 44266, Tel: (330) 297-0811	

15.9 COMMUNITY ALERT PROGRAM

It is not anticipated that any site operations will result in a potential emergency that would require PIKA to implement a community alert program. However, in the event that an unplanned event affects the local community, the SS will notify the PIKA PM of potential hazard. The PIKA PM will contact the CELRL who in turn will

notify the Camp Ravenna Range Control, Ohio EPA and OHARNG of the potential hazard.

15.10 SPILL CONTAINMENT

15.10.1 Spill Response Supplies

A portable spill response kit containing absorbent pads, kitty litter, chemical-resistant gloves, applicable tools, and other needed supplies identified during the on-site operational risk assessment will be maintained in a readily accessible location near the vehicle or equipment fueling operations. Upon notification of a spill, the UXOSO, or a party designated by the UXOSO, will transport this kit (or its components) to the spill site for use.

15.10.2 Spill Prevention

Great care and effective planning will take place to guard against spills. The UXOSO will conduct an overall spill response assessment before beginning operations. Personnel will be briefed accordingly.

15.10.3 Spill Response

All spills will be reported to the Camp Ravenna Range Control in accordance with the Camp Ravenna Integrated Contingency Plan and the First Responder Form. PIKA will perform, at a minimum, the following emergency procedures if a spill occurs:

- Initiate the Camp Ravenna Integrated Contingency Plan
- Immediately notify Camp Ravenna Range Control at 614-336-6041, the CELRL, the Camp Ravenna Restoration Project Manager and OHARNG Environmental Specialist (within 1 hour), The OHARNG will notify the Ohio EPA for spills in excess of the material's Reportable Quantity. PIKA will not make direct contact with the Ohio EPA.

- Halt site operations in the area and take immediate measures, using PPE and personnel, to control and contain the spill as directed by Range Control;
- Isolate the hazardous area through flagging, removing, or extinguishing ignition sources and evacuation of all unnecessary personnel from the area;
- If mandated by the nature of the spill, evacuate personnel upwind to the pre-designated assembly area, and post personnel at access routes to prevent unauthorized personnel from entering the area; and
- Implement control measures, if needed, to reduce vapors, gases, and/or dust emissions.
- Submit necessary reports and forms as required to Range Control and the Camp Ravenna Environmental Office within 24 hours of the initial spill.

16.0 LOGS, REPORTS, AND RECORDKEEPING

16.1 SAFETY LOG

The UXOSO will maintain a Safety Log by ensuring that all safety and health-related activities and events are recorded in the log each day. At a minimum, the Safety Log should include a reference to the conduct of the daily safety briefing; details of any accidents, injuries, illnesses, or near misses; details related to the conduct and outcome of internal and external audits; the reason for, and duration of, safety-related "stop work" orders; and any other issues pertaining to site or personnel safety or health.

16.2 INJURY/ILLNESS/ACCIDENT REPORTS

In the event that a reportable accident/incident occurs at the job site, the PIKA Accident/Near Miss Reporting form will be completed and forwarded the same day the accident/incident occurs to the Camp Ravenna Range Control, the PM, and PIKA PM. In addition, if OSHA Form 300 needs to be completed, the UXOSO will forward the required information to the CESHM so the form may be completed as required. If a near miss occurs, the UXOSO will investigate the incident and report the results of the investigation using the PIKA Accident/Near Miss Report form. This form will be forwarded to the CESHM to be reviewed by the CESHM and PM.

16.3 TRAINING LOG

The UXOSO is responsible for ensuring that all safety and health-related training is documented in the Training Log and/or on the appropriate training forms. This log will include the initial site-specific training conducted before the start of site activities, the daily/weekly safety briefings, hazard-specific training, emergency response exercises, and the like. The UXOSO will maintain this log and any associated training forms on-site.

16.4 VISITOR LOG

The UXOSO will be responsible for maintaining the PIKA site Visitor's Log, which will be used to record the entry and exit of all visitors, including PIKA; contractor visitors; or federal, state, or local officials who visit the site. All information required by the Visitor Log will be completed by the site visitor and the UXOSO. No visitors will be allowed to enter the project site or WZs without completing the required information and associated training.

ATTACHMENT 2

ACTIVITY HAZARD ANALYSIS FORMS

Compliance Restoration Site CC RVAAP-80

ACTIVITY HAZARD ANALYSIS

Date Prepared: 7-30-2015

Overall Risk Assessment Code (RAC)
(Use highest code from Job Steps below.) **M**

Project Location: Ravenna Army Ammunition Plant (RVAAP), Ohio

Prepared By: Sarosh J. H. Manekshaw, CIH

Job: Mobilization, Site Set-up, Demobilization

Reviewed By: Rick Callahan

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
Mobilization: 1. Coordination for the mobilization of equipment, materials and supplies. 2. Travel to project site. 3. Site Orientation and training conducted IAW the SSHP.	General	• A site safety indoctrination will be conducted IAW the SSHP. • Site personnel will be given daily task-specific briefings, regarding associated hazards, including procedures used to mitigate the hazards and protect personnel. • An on-going operational risk assessment will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed at the time of recognition.	NA

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
Site Set-up: 1. Initial site assessment will be conducted, identifying hazards and refined approach to task execution. 2. Initial task brief will be conducted outlining roles and responsibilities. **Demobilization:** 1. Upon project completion, removal of all materials and equipment. 2. Removal of all project generated wastes and general trash. 3. Proper packaging and shipment of equipment, materials and supplies will be coordinated.	Collision with other vehicles, objects or pedestrians.	• Wear seat belt • Keep safe distance from other vehicle(s); use 2 second rule • Obey speed limit/traffic rules • Avoid distractions, e.g. cell phones, eating/drinking, reading map – stop/pull over to perform activities that may distract • Have proper directions to site; take route free of known road hazards, e.g. construction, pot holes; congested traffic flow • Maintain vehicle safety equipment, e.g. mirrors, alarms, horns, wipers, lights • Maintain vehicle, e.g. tire pressure, fluid levels • Keep head lights on for maximum visibility • Perform 360 degree walk-around of vehicle to look for potential hazards/obstructions before pulling-out of parking spaces (back-in parking space if possible) • Use a spotter if backing in/out of hazardous area, e.g. blind spot.	18.A-K
	Complacency	• Stay alert. • Participate in briefings. • Remain engaged within the process.	
	Slips, trips and falls	• All personnel will maintain clean work areas to mitigate trip hazards. • Stay aware of uneven walking and working surfaces. • Exercise good housekeeping procedures. • Situational Awareness	2.B,14.D
	Cuts and Lacerations	• Leather gloves will be used for all tasks with a potential for cuts or lacerations. • Based on the SSHO's operational risk assessment, Kevlar liners may be purchased for use; the liners are intended to be used beneath the leather glove, affording added protection. • Think through process and avoid rushing.	5.A, 5.H

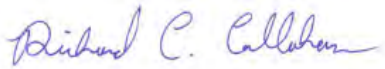
JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
	Fuels	• Flammable liquids will be kept in closed, approved containers. • Chemical protective gloves will be worn when handling fuels. • Spill kit will be centrally located.	9.A, 9.B, 9.F
	Eye Injury	• Personnel will wear ANSI Z87.1 approved safety glasses • An Eye wash station will be available on-site (15-minute ANSI Z358.1 approved eye wash station).	5.B
	Manual lifting of heavy objects	• Personnel will use safe lifting procedures and lift with their legs and not their backs. • Mandatory for 2 personnel (or additional as needed) to lift loads > 50 pounds. • Bend at the knees, keep head straight, grip load close to body and do not twist on the way up. • Enforce safe lifting practices as listed within PIKA Manual Lifting and Material Handling Safety SOP-522.	14.A
	Pinch Points	• All personnel will be advised of potential pinch points. • When pinch points have been identified and cannot be eliminated, guards or barricades will be used. • Maintain heightened situational awareness.	16.A

Equipment to Be Used	Inspections Required	Training Required
Personal Protective Equipment- Level D: ➢ Safety Glasses ➢ Safety-Toed Boots ➢ Hard Hat (as needed for overhead hazards). ➢ Hearing Protection (as required) ➢ ANSI Class 2 reflective warning vests (as needed for heavy equipment and vehicular exposure)	➢ Daily inspections of hand/power tools. ➢ Visual Inspections of designated work areas to identify and address hazardous conditions. ➢ Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc).	40-Hour HAZWOPER (as applicable). 8-Hour Refresher (as applicable). Initial Site Orientation Training. Task Hazard Training. Fire Extinguisher Training. Valid state issued driver's license

Task Specific: ➢ Hand Tools ➢ Power Tools (as applicable) ➢ Site Vehicles ➢ Subcontractor equipment (as applicable). **General:** ➢ Eye wash station (15-minute ANSI Z358.1 approved eye wash station). ➢ First Aid/BBPK/CPR shield ➢ Spill Kit ➢ Communication devices ➢ Fire Extinguishers	➢ An on-going risk assessment (inspection) will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed, at the time of recognition.	HAZCOM Training. PPE Training. SSHO- 30hr OSHA Construction Safety 2ea 1st Aid/CPR trained personnel (2 per site for medical attention when a medical facility or physician is more than 5 minutes away, for a site with two or more employees). MEC Awareness

Certification Of Activity Hazard Analysis

The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.

Signature of Analyst:	Date:	Signature of Reviewer:	Date:
	7-30-2015		7-30-2015

ACTIVITY HAZARD ANALYSIS

Date Prepared: 7-30-2015

Project Location: Ravenna Army Ammunition Plant (RVAAP), Ohio

Prepared By: Sarosh J. H. Manekshaw, CIH

Job: Vegetation Removal

Reviewed By: Rick Callahan

Overall Risk Assessment Code (RAC)
(Use highest code from Job Steps below.) **M**

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Severity	**Catastrophic**	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Job Steps	**Hazards**	**Actions to eliminate or minimize hazards**	**EM 3851-1-1 (PARA REF)**
Vegetation Removal and Brush Clearance (*Manual Cutting with weed-eaters, chainsaws and tractor mounted brush hog):* 1. Inspect vehicles and equipment accordingly. 2. Conduct task specific brief outlining	General	• A site safety indoctrination will be conducted IAW the SSHP. • Site personnel will be given daily task-specific briefings regarding anticipated hazards inclusive of the procedures used to mitigate these hazards and protect personnel. • An on-going operational risk assessment will be conducted to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed at the time of recognition.	

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
personnel roles and responsibilities. 3. The PIKA subcontractor will cut/remove only the brush that hinders the performance of the sampling operations and the removal of the previously identified metal items.	Flying Debris	• Site personnel will wear a helmet with face screen and safety glasses for operations with threat of flying debris when other controls are inadequate. • Safety observers will maintain a safe distance from operators of vegetation clearance equipment.	5.A, 31.D
	Equipment Failure	• Conduct pre-operational checks on all equipment before beginning operations. • Continually assess equipment function for deficient behavior.	18.A
	Physical Strain	• Personnel will be cautioned about physical strain associated with pulling fallen brush and operating vegetation removal equipment. • Personnel will use caution to not over exert themselves or overstrain muscles and joints. • Regular stretching activities will be encouraged.	14.A
	Fire	• Chainsaws will have a functioning spark arrester. • Vegetation removal equipment will be allowed to cool before refueling. • Be careful not to set hot equipment on combustibles (fallen vegetation). • Extinguishers and absorbent pads will be readily available at equipment fueling area. • Designated smoking areas will be established and their use will be strictly enforced.	9.B, 9.F
	Fuels	• Flammable liquids will be kept in closed, approved containers. • Chemical protective gloves will be worn when handling fuels. • Absorbent pads will be readily available at equipment fueling area. • Spill kit will be centrally located.	9.A
	Slips, trips and falls	• Fallen brush will be removed regularly from equipment operator's work area.	2.B, 14.D

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
		• Personnel will be aware of uneven walking and working surfaces. • Good housekeeping procedures will be implemented. • Maintain heightened situational awareness.	
	Cuts and Lacerations	• Leather gloves will be used with a helmet and screened face shield when pulling fallen vegetation; unless other suitable controls have been implemented. • A careful assessment must be executed to identify thorns before exposure; thorns are very dangerous and will cut, scrape and rip personnel's skin. • Based on the SSHO's operational risk assessment, Kevlar liners may be purchased for use; the liners are intended to be used beneath the leather glove, affording added protection.	5.A, 5.H
	Complacency	• Stay alert. • Participate in briefings. • Remain engaged within the process.	
	Bush Hog Operation	• Bush Hog Operator will be qualified as such. • The subcontractor and PIKA SSHO will designate a personnel exclusion zone during the bush hog operation.	5.A, 31.D
	Biological	• Biological hazards that may be encountered include stinging and biting insects, hazardous plants, and snakes, bears and cougars. • Insect repellant will be used by site personnel as needed to repel hazardous insects. • Site personnel will report to the SSHO the presence of any hazardous animals, insects or plants. • Leave animals alone and allow them to vacate on their own accord. • The SS will be contacted for animal concerns inhibiting work; do not attempt to be a Hero.	6.E

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
	Unauthorized Entry/Site access control	• Site personnel will maintain a constant watch for intrusion of unauthorized personnel. • Positive site access control will be established prior to on-site operations using barricades, signs or other methods to prevent unauthorized access during tasks that could cause exposure to ES&H hazards. • An exclusion sign-in/sign-out log will be maintained for personnel accountability.	33.B
	UV Radiation	• Site personnel will be cautioned about the possibility and effects of sunburns. • Sunscreen will be provided for personnel use. • Personnel hypersensitive to UV rays will take additional precautions as applicable. • During blinding sunshine, shaded lensed safety glasses will be used for protection of eyes and to allow for clear vision.	5.B
	Use of weed-eater and chainsaw (Manual Vegetation Removal)	• Personnel will be trained in the proper use of hand-held vegetation clearance equipment. • A safety observer will be assigned to vegetation clearance personnel. • All vegetation clearance equipment will be properly inspected before use. • Chain saws will have a functioning spark arrester. • Adequate hazard zones will be outlined, for each employee, as associated with the hazards of their corresponding equipment.	31.D, 31.E
	Eye Injury	• Use of insect repellant, fuels and other chemicals on site creates the potential for accidental spraying/splashing of chemicals into the eyes; personnel shall guard against overspray exposure by maintaining heightened situational awareness and exercising a cautious approach.	5.B

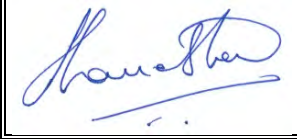
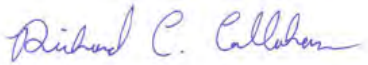
Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
		• Guard against eye contact with branches and shrubbery by managing hazards and using appropriate PPE. • An ANSI Z358.1 approved 15-minute eye wash station will be located in a centralized location.	

Equipment to Be Used	Inspections Required	Training Required
Qualified Personal Protective Equipment- Level D or Modified Level D (as determined by SSHO): ➢ Safety Glasses ➢ Leather Gloves ➢ Safety-Toed Boots ➢ Hearing Protection (required for noise levels> 85dBA) ➢ Helmet with face screen (as needed for overhead hazards and flying debris). ➢ Lightweight Tyvek®, (as required for poisonous plants) ➢ Addition of chaps, face-screen and helmet, for chain saw operations. ➢ Addition of face-screen and helmet for weed-eating operations. **Specific Equipment:** ➢ Weed-eater ➢ Chainsaw (as applicable) ➢ Tractor mounted bush hog **General:** ➢ Eye wash station (15-minute ANSI Z358.1 approved eye wash station).	➢ Daily Inspection of all equipment. ➢ Spot check of competent/qualified personnel training records for required training. ➢ Visual Inspections of designated work areas to identify and address hazardous conditions. ➢ Emergency Response equipment Inspections (Fire Extinguishers, Eye Wash, First Aid/CPR etc.) ➢ An on-going operational risk assessment (inspection) will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed, at the time of recognition.	40-Hour HAZWOPER 8-Hour Refresher Initial Site Orientation Training Task Hazard Training Fire Extinguisher Training HAZCOM Training PPE Training Qualified bush hog operator Equipment operation training (chainsaw, weed-eater etc...) SSHO- 30hr OSHA Construction Safety (1 employee) MEC Awareness Training 2ea 1st Aid/CPR trained personnel (2 per site for medical attention when a medical facility or physician is more than 5 minutes away, for a site with two or more employees).

➢ First Aid/BBPK/CPR shield ➢ Fire Extinguisher ➢ Spill Kit ➢ Communication Devices		

Certification Of Activity Hazard Analysis

The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.

Signature of Analyst:	Date: 7-30-2015	Signature of Reviewer:	Date: 7-30-2015
			

ACTIVITY HAZARD ANALYSIS

Date Prepared: 7-30-2015

Project Location: Ravenna Army Ammunition Plant (RVAAP), Ohio

Prepared By: Sarosh J. H. Manekshaw, CIH

Job: Collect surface and subsurface soil samples (Geoprobe)

Reviewed By: Rick Callahan

Overall Risk Assessment Code (RAC)
(Use highest code from Job Steps below.) **M**

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

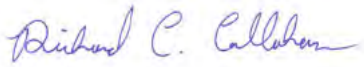
Severity	Probability: Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	L	L	L	L	L
Critical	L	L	L	L	L
Marginal	L	L	L	L	L
Negligible	L	L	M	M	M

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
Surface and Subsurface Sample Collection: 1. Inspect vehicles and equipment accordingly. 2. Conduct task specific brief outlining personnel roles and responsibilities. 3. If needed, move, containerize and dispose of propellant can/tops as scrap metal. 4. Install sample borings (direct push),	General	• A site safety indoctrination will be conducted IAW the SSHP. • Site personnel will be given daily task-specific briefings regarding anticipated hazards inclusive of the procedures used to mitigate these hazards and protect personnel. • An on-going operational risk assessment will be conducted to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed at the time of recognition.	
	Slips, trips and falls	• All personnel will maintain clean work areas to remove trip hazards. • Stay aware of uneven walking and working surfaces. • Be very cautious navigating in and around water obstacles.	2.B, 14.D

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
collect and process sample for shipment to laboratory and subsequently ship. .		• Exercise good housekeeping procedures. • Situational Awareness.	
	Biological	• Biological hazards that may be encountered include stinging and biting insects, hazardous plants, snakes, bears and cougars. • Insect repellant will be used by site personnel as needed to repel hazardous insects. • Site personnel will report to the SSHO the presence of any hazardous animals, insects or plants. • Leave animals alone and allow them to vacate on their own accord. • The SS will be contacted for animal concerns inhibiting work; do not attempt to be a Hero.	6.E
	Complacency	• Stay alert. • Participate in briefings. • Remain engaged within the process.	
	Pinch Points	• All personnel will be advised of potential pinch points. • When pinch points have been identified and cannot be eliminated, guards or barricades will be used. • Maintain heightened situational awareness.	16.A
	UV Radiation	• Site personnel will be cautioned about the possibility and effects of sunburns. • Sunscreen will be provided for personnel use. • Personnel hypersensitive to UV rays will take additional precautions as applicable. • During blinding sunshine, shaded lensed safety glasses will be used for protection of eyes and to allow for clear vision.	5.B
	Cuts and Lacerations	• Leather gloves will be used for all tasks with a potential for cuts or lacerations. • If conditions dictate, lightweight Kevlar liners will be worn beneath the	5.A, 5.H

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
		leather glove for added protection.	
	Eye injury	• Personnel will wear ANSI Z87.1 approved safety glasses. • An Eye wash station will be available on-site (15-minute ANSI Z358.1 approved eye wash station).	5.B
	Geoprobe Operation	• The subcontractor and SSHO will establish a designated exclusion zone during the operation of the Geoprobe. • During the Geoprobe operation, PIKA personnel will stand outside the exclusion area until the drill blade has completed stopped. • At no time will personnel approach an active drill. • A thorough review of this AHA and a Job Safety Analysis will be conducted before beginning Geoprobe operations (Form-536, Attachment 4).	

Equipment to Be Used	Inspections Required	Training Required
Personal Protective Equipment- Level D: ➢ Safety Glasses ➢ Safety-Toed Boots ➢ Nitrile gloves **Task Specific:** ➢ Truck ➢ Sampling related materials and equipment ➢ Geoprobe **General:** ➢ Eye wash station (15-minute ANSI Z358.1 approved eye wash station) . ➢ First Aid/BBPK/CPR shield/Fire Extinguishers ➢ Spill Kit ➢ Communication devices	➢ Daily inspections of Equipment . ➢ Visual Inspections of designated work areas to identify and address hazardous conditions. ➢ Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc.). ➢ An on-going risk assessment (inspection) will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed, at the time of recognition.	40-Hour HAZWOPER (as applicable) 8-Hour Refresher (as applicable) Initial Site Orientation Training. Task Hazard Training. Fire Extinguisher Training. HAZCOM Training. PPE Training. MEC Awareness Licensed Driller (Geoprobe Operator) 2ea 1st Aid/CPR trained personnel (2 per site for medical attention when a medical facility or physician is more than 5 minutes away, for a site with two or more employees).

Certification Of Activity Hazard Analysis			
The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.			
Signature of Analyst: 	Date: 7-30-2015	Signature of Reviewer: 	Date: 7-30-2015

ACTIVITY HAZARD ANALYSIS

Date Prepared: 7-30-2015

Project Location: Ravenna Army Ammunition Plant (RVAAP), Ohio

Prepared By: Sarosh J. H. Manekshaw, CIH

Job: Surface and Near-surface MPPEH Clearance

Reviewed By: Rick Callahan

Overall Risk Assessment Code (RAC)
(Use highest code from Job Steps below.) **M**

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Severity	**Catastrophic**	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Job Steps	**Hazards**	**Actions to eliminate or minimize hazards**	**EM 3851-1-1 (PARA REF)**
Surface and Near-surface MPPEH Clearance 1. Utilizing a hand-held Magnetometers to pin point anomalies. a. Sweep the area of concern, pinpoint anomaly. 2. Excavate to locate anomaly. a. Excavate, with hand tools, along side of the anomaly.	General	• A site safety indoctrination will be conducted IAW the SSHP. • Site personnel will be given daily task-specific briefings regarding associated hazards including procedures used to mitigate the hazards and protect personnel. • An on-going operational risk assessment will be conducted to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed at the time of recognition. • Subcontractors, if required, will be required to read and sign the ESHPs that affect their operations. • All personnel will wear a minimum of Level D PPE. • No smoking, except in designated areas.	

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
b. The anomaly will be excavated until cleared to depth or the anomaly is located. 3 Identify anomaly. a. Identify, and if safe to do so, remove.		• Personnel shall wear a high-visibility shirt or vest at all times.	
	Exclusion Zone Operations	• Site personnel will maintain a constant watch for intrusion of unauthorized personnel. • Positive site access control will be established prior to on-site operations using barricades, signs or other methods to prevent unauthorized access during tasks that could cause exposure to MEC or other ES&H hazards. • An exclusion sign-in/sign-out log will be maintained for personnel accountability.	33.B
	Adverse Weather	• When there are warnings or indications of impending severe weather, conditions will be monitored and appropriate precaution taken to protect personnel and property as specified in the SSHP. • All site operations will be suspended if lightning is detected within 5 miles of the site. • Personnel will remain in cover for 30 minutes after the last lightning strike is observed. (Cover includes a building or a field vehicle.) The UXOSO will consult the SSHP for other limiting weather conditions such as high winds, rain, etc.	
	Physical Strain	• Personnel will be cautioned about physical strain associated with pulling fallen brush and operating vegetation removal equipment. • Personnel will use caution to not over exert themselves or overstrain muscles and joints. • Regular stretching activities will be encouraged.	14.A
	Fire	• Chainsaws will have a functioning spark arrester. • Vegetation removal equipment will be allowed to cool before refueling. • Be careful not to set hot equipment on combustibles (fallen vegetation). • Extinguishers and absorbent pads will be readily available at equipment fueling area.	9.B, 9.F

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
		• Designated smoking areas will be established and their use will be strictly enforced.	
	Slips, trips and falls	• All personnel will maintain clean work areas to mitigate trip hazards. • Stay aware of uneven walking and working surfaces. • Fallen brush will be removed regularly from equipment operator's work area. • Good housekeeping procedures will be implemented. • Maintain heightened situational awareness.	2.B, 14.D
	Cuts and Lacerations	• Leather gloves will be used with a helmet and screened face shield when pulling fallen vegetation; unless other suitable controls have been implemented. • A careful assessment must be executed to identify thorns before exposure; thorns are very dangerous and will cut, scrape and rip personnel's skin. • Based on the UXOSO's operational risk assessment, Kevlar liners may be purchased for use; the liners are intended to be used beneath the leather glove, affording added protection.	5.A, 5.H
	Heavy Equipment Operation (if required)	• Heavy equipment operators will be trained on the use, inspection and maintenance of the heavy equipment they use, and all site personnel will be briefed regarding safe operation near heavy equipment. • LO/TO will be used as determined by the UXOSO for maintenance of heavy equipment. ANSI Class II Safety vest and hard hat will be worn when working within 50 feet of equipment. Personnel will follow the JV Manual Heavy Equipment Operations SOP-518.	18.A, 18.H
	Use of Hand and Power Tools	• Hand and power tools will be selected to ensure that the right tool is being used for the right job and being used in the manner in which it was intended to be used. • All hand and power tools will be inspected daily prior to use and any	13.A

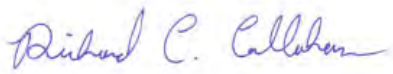
Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
		defective tools will be tagged and removed from service immediately. • All portable electrical tools and equipment, if used, will be used with a Ground Fault Circuit Interrupter (GFCI) placed in-line as close to the electrical supply source as possible. • Personnel will follow the other requirements of SOP-520, Hand and Power Tool Safety to ensure proper use of the hand and power tools anticipated for this project.	
	Biological	• Biological hazards that may be encountered include stinging and biting insects, hazardous plants, and snakes. • Personnel having allergic reactions will be identified and managed accordingly. • Insect repellent will be used by site personnel as needed to repel hazardous insects. • Site personnel will report to the UXOSO and their team leader the presence of any hazardous animals, insects or plants. • Leave animals alone and allow them to vacate on their own accord. • The UXOSO will be contacted for animal concerns inhibiting work; do not attempt to be a Hero. • SOP-503 (ID and Control of Biological Hazards) will be reviewed with site employees during indoctrination.	6.E
	Unauthorized Entry/Site access control	• Site personnel will maintain a constant watch for intrusion of unauthorized personnel. • Positive site access control (where practical) will be established prior to on-site operations to prevent unauthorized access during tasks that could cause exposure to MEC or other ES&H hazards. • Site Management will keep 100% accountability of personnel within our contracted work areas.	33.B

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
	UV Radiation	• Site personnel will be cautioned about the possibility and effects of sunburns. • Sunscreen will be provided for personnel use. • Personnel hypersensitive to UV rays will take additional precautions as applicable. • During blinding sunshine, shaded lensed safety glasses will be used for protection of eyes and to allow for clear vision.	5.B
	Manual Lifting of Heavy Objects	• Personnel will use safe lifting procedures and lift with their legs and not their backs. • Mandatory for (2) personnel (or additional as needed) to lift loads > 50 pounds. • Bend at the knees, keep head straight, grip load close to body and do not twist on the way up. • Enforce safe lifting practices as listed within PIKA Manual Lifting and Material Handling Safety SOP-522.	14.A
	Eye Injury	• Personnel will wear ANSI Z87.1 approved safety glasses. • Use of insect repellent, fuels and other chemicals on site creates the potential for accidental spraying/splashing of chemicals into the eyes; personnel shall guard against overspray exposure by maintaining heightened situational awareness and exercising a cautious approach. • Guard against eye contact with branches and shrubbery by managing hazards and using appropriate PPE.	5.B
	Heat and Cold Stress (As applicable to seasonal environment)	• Personnel with history of heat and cold related injuries will be identified and managed accordingly. • Allowing personnel to properly acclimatize and remain hydrated is of the utmost importance; the UXOSO will focus on this during the exposure assessment.	6.J

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)
		• Regular breaks will be scheduled based on UXOSO assessment and/or physiological monitoring results. Heat Stress: • UXOSO will conduct an exposure assessment related to the intensity of activities and duration of personnel exposure. • Overhead shading covers will be used, where practical, to keep personnel out of direct sunlight. To reduce the effects of heat and exposure to direct sunlight personnel will take water and scheduled breaks within the shade and cover provided by the natural canopy whenever possible • Based on an ongoing operational hazard assessment and any time discomfort due to heat stress is either noticed or reported; the UXOSO will institute physiological monitoring IAW SOP-506 Heat Stress Prevention. Cold Stress: • Based on an ongoing operational hazard assessment and any time discomfort due to cold stress is either noticed or reported; the SSHO will institute, at a minimum, additional time for personnel warming. • UXOSO will verify that personnel are wearing appropriate field attire for the relative cold weather exposure. • When ambient temperatures are below 61 degrees F, PIKA will implement SOP-507, Cold Stress Prevention.	
	Pinch Points	• Pinch points may exist during the loading and unloading of equipment and materials. • All personnel will be advised of potential pinch points. • When pinch points have been identified and cannot be eliminated, guards or barricades will be used. • Maintain heightened situational awareness.	16.A

Job Steps	Hazards	Actions to eliminate or minimize hazards	EM 3851-1-1 (PARA REF)

Equipment to Be Used	Inspections Required	Training Required
Qualified Personal Protective Equipment- Level D or Modified Level D (as determined by SSHO): ➢ Safety Glasses ➢ Leather Gloves ➢ Safety-Toed Boots ➢ Hearing Protection (required for noise levels> 85dBA) ➢ Helmet with face screen (as needed for overhead hazards and flying debris). ➢ Lightweight Tyvek®, (as required for poisonous plants) ➢ Addition of chaps, face-screen and helmet, for chain saw operations. ➢ Addition of face-screen and helmet for weed-eating operations. **Specific Equipment:** ➢ Magnetometers (as required in ESS/WP) ➢ Hand digging tools ➢ Excavator (if required) **General:** ➢ Eye wash station (15-minute ANSI Z358.1 approved eye wash station). ➢ First Aid/BBPK/CPR shield ➢ Fire Extinguisher ➢ Spill Kit ➢ Communication Devices	➢ Daily Inspection of all equipment. ➢ Spot check of competent/qualified personnel training records for required training. ➢ Visual Inspections of designated work areas to identify and address hazardous conditions. ➢ Emergency Response equipment Inspections (Fire Extinguishers, Eye Wash, First Aid/CPR etc.) ➢ An on-going operational risk assessment (inspection) will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed, at the time of recognition.	40-Hour HAZWOPER 8-Hour Refresher Initial Site Orientation Training Task Hazard Training Fire Extinguisher Training HAZCOM Training PPE Training Equipment Operation Training (if required) Personnel conducting maintenance and servicing will be provided LO/TO training SSHO- 30hr OSHA Construction Safety (1 employee) MEC Awareness Training All personnel operating hand tools will be trained in proper inspection, maintenance and use of the hand tools 2ea 1st Aid/CPR trained personnel (2 per site for medical attention when a medical facility or physician is more than 5 minutes away, for a site with two or more employees).

Certification Of Activity Hazard Analysis			
The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.			
Signature of Analyst: 	Date: 7-30-2015	Signature of Reviewer: 	Date: 7-30-2015

ACTIVITY HAZARD ANALYSIS

Date Prepared: 7-30-2015

Project Location: Ravenna Army Ammunition Plant (RVAAP), Ohio

Prepared By: Sarosh J. H. Manekshaw, CIH

Job: MPPEH Inspection and Disposal

Reviewed By: Rick Callahan

Overall Risk Assessment Code (RAC)
(Use highest code from Job Steps below.) **M**

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability: Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	L	L	L	L	L
Critical	L	L	L	L	L
Marginal	L	L	L	L	L
Negligible	L	L	M	M	M

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
MPPEH Inspection and Disposal : 1. Establish location for desired work area to conduct inspection operations, to include: a. Establish Work Area Control Zones. b. Debris Identification. c. Munitions Debris Segregation. 2. Segregate items for MPPEH assessment, to include:	General	• A site safety indoctrination will be conducted IAW the SSHP. • Site personnel will be given daily task-specific briefings regarding anticipated hazards inclusive of the procedures used to mitigate these hazards and protect personnel. • An on-going operational risk assessment will be conducted to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed at the time of recognition. • Subcontractors, if required, will be required to read and sign the ESHPs that affect their operations. • All personnel will wear a minimum of Level D PPE.	

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
a. Ordnance Identification (there is a low probability of discovering UXO/MEC during this work). b. Disposal (if required). c. Munitions Debris Segregation. 3. Segregate metal scrap and items for MD assessment, to include: a. Ordnance Identification (if required). b. Disposal (if required). c. Munitions Debris Segregation. 4. Segregate non UXO metal scrap and non metal scrap items assessment, to include: a. Munitions Debris Segregation. b. Packaging. .		• No smoking, except in designated areas. • Personnel shall wear a high-visibility shirt or vest at all times.	
	Adverse Weather	• When there are warnings or indications of impending severe weather, conditions will be monitored and appropriate precaution taken to protect personnel and property as specified in the SSHP. • All site operations will be suspended if lightning is detected within 5 miles of the site. • Personnel will remain in cover for 30 minutes after the last lightning strike is observed. (Cover includes a building or a field vehicle.) • The UXOSO will consult the SSHP for other limiting weather conditions such as high winds, rain, etc.	
	Physical Strain	• Personnel will be cautioned about physical strain associated with moving or lifting objects. • Personnel will use caution to not over exert themselves or overstrain muscles and joints. • Regular stretching activities will be encouraged. • Proper lifting techniques will be emphasized. One person will not lift more than 50 pounds. Instead, get assistance or use mechanical aids.	14.A
	Fire	• Site personnel will be aware of the fire protection levels and have a fire extinguisher and shovel in their possession. • Smoking will only be allowed in areas designated by the Site Manager.	9.B, 9.F
	Slips, trips and falls	• All personnel will maintain clean work areas to mitigate trip hazards. • Stay aware of uneven walking and working surfaces. • Good housekeeping procedures will be implemented. • Maintain heightened situational awareness.	2.B, 14.D
	Cuts and Lacerations	• Leather gloves will be used with a helmet and screened face shield when pulling fallen vegetation; unless other suitable controls have been implemented.	5.A, 5.H

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
		• A careful assessment must be executed to identify thorns before exposure; thorns are very dangerous and will cut, scrape and rip personnel's skin. • Based on the UXOSO's operational risk assessment, Kevlar liners may be purchased for use; the liners are intended to be used beneath the leather glove, affording added protection.	
	Heavy Equipment Operation (if required)	• Heavy equipment operators will be trained on the use, inspection and maintenance of the heavy equipment they use, and all site personnel will be briefed regarding safe operation near heavy equipment. • LO/TO will be used as determined by the UXOSO for maintenance of heavy equipment. ANSI Class II Safety vest and hard hat will be worn when working within 50 feet of equipment. Personnel will follow the JV • Manual Heavy Equipment Operations SOP-518.	18.A, 18.H
	Use of Hand and Power Tools	• Hand and power tools will be selected to ensure that the right tool is being used for the right job and being used in the manner in which it was intended to be used. • All hand and power tools will be inspected daily prior to use and any defective tools will be tagged and removed from service immediately. • All portable electrical tools and equipment, if used, will be used with a Ground Fault Circuit Interrupter (GFCI) placed in-line as close to the electrical supply source as possible. • Personnel will follow the other requirements of SOP-520, Hand and Power Tool Safety to ensure proper use of the hand and power tools anticipated for this project.	13.A
	Biological	• Biological hazards that may be encountered include stinging and biting insects, hazardous plants, and snakes. • Personnel having allergic reactions will be identified and managed accordingly. • Insect repellent will be used by site personnel as needed to repel	6.E

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
		hazardous insects. • Site personnel will report to the UXOSO and their team leader the presence of any hazardous animals, insects or plants. • Leave animals alone and allow them to vacate on their own accord. • The UXOSO will be contacted for animal concerns inhibiting work; do not attempt to be a Hero. • SOP-503 (ID and Control of Biological Hazards) will be reviewed with site employees during indoctrination.	
	Unauthorized Entry/Site access control	• Site personnel will maintain a constant watch for intrusion of unauthorized personnel. • Positive site access control will be established prior to on-site operations using barricades, signs or other methods to prevent unauthorized access during tasks that could cause exposure to MEC or other ES&H hazards. • An exclusion sign-in/sign-out log will be maintained for personnel accountability.	33.B
	UV Radiation	• Site personnel will be cautioned about the possibility and effects of sunburns. • Sunscreen will be provided for personnel use. • Personnel hypersensitive to UV rays will take additional precautions as applicable. • During blinding sunshine, shaded lensed safety glasses will be used for protection of eyes and to allow for clear vision.	5.B
	Manual Lifting of Heavy Objects	• Personnel will use safe lifting procedures and lift with their legs and not their backs. • Mandatory for (2) personnel (or additional as needed) to lift loads > 50 pounds. • Bend at the knees, keep head straight, grip load close to body and do not twist on the way up. • Enforce safe lifting practices as listed within PIKA Manual Lifting and	14.A

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
		Material Handling Safety SOP-522.	
	Eye Injury	• Personnel will wear ANSI Z87.1 approved safety glasses. • Use of insect repellent, fuels and other chemicals on site creates the potential for accidental spraying/splashing of chemicals into the eyes; personnel shall guard against overspray exposure by maintaining heightened situational awareness and exercising a cautious approach. • Guard against eye contact with branches and shrubbery by managing hazards and using appropriate PPE.	5.B
	Heat and Cold Stress (As applicable to seasonal environment)	• Personnel with history of heat and cold related injuries will be identified and managed accordingly. • Allowing personnel to properly acclimatize and remain hydrated is of the utmost importance; the UXOSO will focus on this during the exposure assessment. • Regular breaks will be scheduled based on UXOSO assessment and/or physiological monitoring results. **Heat Stress:** • UXOSO will conduct an exposure assessment related to the intensity of activities and duration of personnel exposure. • Overhead shading covers will be used, where practical, to keep personnel out of direct sunlight. To reduce the effects of heat and exposure to direct sunlight personnel will take water and scheduled breaks within the shade and cover provided by the natural canopy whenever possible • Based on an ongoing operational hazard assessment and any time discomfort due to heat stress is either noticed or reported; the UXOSO will institute physiological monitoring IAW SOP-506 Heat Stress Prevention. **Cold Stress:** • Based on an ongoing operational hazard assessment and any time	6.J

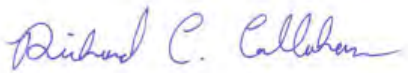
JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 3851-1-1 (PARA REF)
		discomfort due to cold stress is either noticed or reported; the SSHO will institute, at a minimum, additional time for personnel warming. • SSHO will verify that personnel are wearing appropriate field attire for the relative cold weather exposure. • When ambient temperatures are below 61 degrees F, PIKA will implement SOP-507, Cold Stress Prevention.	
	Explosion	• Only unexploded ordnance (UXO) personnel who meet the requirements of the SSHP will be permitted to conduct the inspection of MPPEH. • Based upon the information to date, the site is a Low Probability Site in regards to encountering MEC. • However, if prior to this project or during any phase of this project MEC are found at the site, the project may be stopped and the site will need to be reevaluated and potentially assigned a new probability rating.	1.G, 6.A
	Pinch Points	• Pinch points may exist during the loading and unloading of equipment and materials. • All personnel will be advised of potential pinch points. • When pinch points have been identified and cannot be eliminated, guards or barricades will be used. • Maintain heightened situational awareness.	16.A

Equipment to Be Used	Inspections Required	Training Required
Personal Protective Equipment- Level D (as determined by SSHO): ➢ Safety Glasses ➢ Hard Hat and Safety-Toes Boots (as required for heavy equipment ops, or when an overhead or drop hazard is present) ➢ Leather Gloves ➢ Hearing Protection (as required for high noise	➢ Daily inspections of Equipment . ➢ Visual Inspections of designated work areas to identify and address hazardous conditions. ➢ Emergency Response equipment Inspections (Fire Extinguishers, Eye wash First Aid/CPR etc.).	40-Hour HAZWOPER (as applicable) 8-Hour Refresher (as applicable) Initial Site Orientation Training. Task Hazard Training. Fire Extinguisher Training. HAZCOM Training.

>85dBA) **Task Specific:** ➢ Misc. Hand and Power tools ➢ Excavator (if required) ➢ Rigging/Lifting equipment and devices (if required) **General:** ➢ Eye wash station (15-minute ANSI Z358.1 approved eye wash station) . ➢ First Aid/BBPK/CPR shield/Fire Extinguishers ➢ Spill Kit ➢ Communication devices	➢ An on-going risk assessment (inspection) will be conducted, to identify newly introduced hazards and/or inefficiency of current hazard controls; observations will be addressed, at the time of recognition.	PPE Training. MEC Awareness Equipment Operation Training (if used) Personnel conducting maintenance and servicing will be provided LO/TO training. All personnel operating hand tools will be trained in proper inspection, maintenance and use of the hand tools. 2ea 1st Aid/CPR trained personnel (2 per site for medical attention when a medical facility or physician is more than 5 minutes away, for a site with two or more employees).

Certification Of Activity Hazard Analysis

The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.

Signature of Analyst:	Date:	Signature of Reviewer:	Date:
	7-30-2015		7-30-2015

ATTACHMENT 3

PIKA STANDARD OPERATING PROCEDURES FOR SAFETY AND HEALTH (ON CD)

Standard Operating Procedures (SOP) on CD

200-Series SOPs Specific to Munitions and Explosives of Concern (MEC) Operations

SOP-205 Inspection, Disposal and Chain of Custody

400-Series SOPs Specific to Hazardous and Toxic Waste (HTW) Activities

SOP-404 Drum Handling & Removal

500-Series SOPs Applicable Across Most PIKA Programs

SOP-503 ID & Control of Biological Hazards
SOP-506 Heat Stress Prevention
SOP-507 Cold Stress Prevention
SOP-508 Bloodborne Pathogen Control
SOP-509 Hazard Communications
SOP-510 Signs and Labeling
SOP-511 Fire Protection and Prevention
SOP-512 Sanitation, Housekeeping and Illumination
SOP-514 Personal Protective Equipment
SOP-515 Safe Vehicle Operation
SOP-518 Heavy Equipment Operation, Inspection and Maintenance
SOP-520 Hand and Power Tools
SOP-521 Control of Hazardous Energy (Lockout/Tagout)
SOP-522 Lifting & Material Handling Safety
SOP-523 Electrical Safety
SOP-524 Site Monitoring and Sampling
SOP-525 Site Safety Health Officer (SSHO)
SOP-526 New Employee/Supervisor Orientation Procedure
SOP-527 PIKA Drug & Alcohol

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to outline the accountability requirements and procedures associated with managing and processing Munitions and Explosives of Concern (MEC).

2.0 PROCEDURES

2.1 INSPECTION OF MATERIAL

Material to be disposed of will first be 100 percent visually inspected to make sure the removal of live rounds, primers, or explosive material occurs. Items that cannot be visually inspected will be either 100 percent physically inspected, vented, or thermally treated to make sure no explosive hazards exist. Munitions fragments, such as those found dispersed within the proximity of demolition or impact ranges will be inspected for the presence of energetic contaminants. All inspections will follow the procedures in Engineering Manual (EM) 385-1-97, Change 1, Chapter 1, Section 11.

2.1.1 Inspection Process

The inspection process will involve the steps outlined below. This multi-step process will make sure that the materials released for disposal are free of explosive hazards.

A. Unexploded Ordnance (UXO) Technician I (UXOTI) will:
   1. Excavate and initially identify MEC, UXO and Discarded Military Munitions (DMM) including possible fuzing and their condition.
   2. Identify and remove non-hazardous materials not directly related to Military Munitions such as ferrous and non-ferrous scrap metals.
   3. Identify and mark material potentially presenting and explosive hazard (MPPEH) (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris) which may contain an explosive hazard for inspection and removal by a UXO Qualified Technician II (UXOTII) or UXO Technician III (UXOTIII).
   4. Initially identify and mark possible UXO, MPPEH or MEC which may contain an explosive hazard, for inspection and removal by a UXOTII or UXOTIII.
   5. Assist the UXOTII/III in the inspection of MPPEH as directed.

B. UXOTII will:
   1. Inspect 100% of items and determine the following:
      - Is the item a UXO, MEC or component of a military munition?
      - Does the item contain explosives or other dangerous materials?
      - Does the item require detonation?
      - Does the item require demilitarization (demil) or venting to expose internal fillers and/or cavities?
   2. Segregate items requiring demil or venting procedures from those items ready for certification.

3. Items found to contain dangerous fillers will be marked or set aside for additional processing such as demolition.

C. UXOTIII will:
1. Inspect 100% of items recovered for proper segregation and confirm the condition of those items classified as free of dangerous fillers, residues or components.
2. Supervise and perform on-site demil of MEC.
3. Supervise detonation of items found to contain dangerous or unexposed fillers and venting/demil procedures.
4. Supervise the safety, consolidation, security and transportation of recovered material within assigned areas.
5. Complete required tracking and reporting documentation for permanent records as directed.

D. If a materials recovery team is employed, the UXO Technicians I/II/III will:
1. Respond to materials consolidation areas as directed by the Senior UXO Supervisor (SUXOS).
2. Inspect items before placing them into transport vehicle.
3. Determine separation requirements of material recovered. (i.e., materials that resembles ordnance, sort by metal types, MEC requiring processing, etc.).
4. Deliver materials to appropriate area and maintain security and segregation to prevent commingling with inspected and certified materials.

E. UXO Quality Control Specialist (UXOQCS) will:
1. Conduct surveillances of the procedures used by MEC teams and individuals for processing materials.
2. Perform and document, a minimum of 10% (100% in some cases), random sampling of materials collected from the various teams to make sure no items of a dangerous or explosives nature are identified as free from hazardous material. The UXOQCS performs these random checks to satisfy the quality control (QC) requirements that the materials are free from any explosive hazards, necessary for completion of the required documentation. UXOQCS should, during generation of small amounts, accomplish a 100% inspection of all materials. Random checks will be both during the process and at the completion/turn-in of materials to verify the method as well as the final result.
3. Inspection should be accomplished daily or not to exceed the end of the work week within which the material was recovered. Inspection will be performed prior to consolidation within a container (barrel, conex, trailer, rolloff etc.).
4. Inspect the prepared documentation and container marking and seals process. At a minimum the UXOQCS will inspect; the Requisition and Turn-in Department of Defense (DoD) Directive (DoDD) document form, Defense Department (DD) 1348-1A and the PIKA International, Inc. (PIKA)'s Form-

205A, Inspection, Certification, and Chain of Custody, Seals, containers, labels and marking methods and verify accuracy of the information contained in documentation.

F. UXO Safety Officer (UXOSO) will:
1. Make sure the specific procedures and responsibilities for processing materials for certification are being followed and performed safely.
2. Confirm that operations are compliant with the Site Safety and Health Plan (SSHP)/Accident Prevention Plan (APP) and consistent with applicable regulations and guidance and in accordance with (IAW) the U.S. Army Corps of Engineers (USACE) approved project work plan.
3. Will perform and document in a timely manner and prior to containerization, random checks of no less than 10% of processed materials to make sure items being identified as scrap are safe and free from any explosive hazards. Random checks will be both during the process and at the completion/turn-in of materials to verify the method as well as the final result.

G. SUXOS will:
1. Be responsible for making sure Work Plans and QC Plans specify the procedures and responsibilities for processing materials for the final disposition.
2. Make sure a Requisition and Turn-in Form, DD Form 1348-1A is completed for material to be transferred.
3. Perform in a timely manner and prior to containerization, random checks to make sure that the material is free from explosive hazards, necessary to complete the DD 1348-1A. Random checks will be both during the process and at the completion/turn-in of materials to verify the method as well as the final result.
4. Certify material as free of explosive hazards or other dangerous material.
5. Be responsible for making sure that inspected materials are secured in a closed, labeled and sealed container and documented as follows:
   a. The container shall be closed and clearly labeled on the outside with the following information: The first container will be labeled with a unique identification that shall start with USACE (if appropriate)/Installation Name/PIKA/0001/Seal's unique identification and continue sequentially.
   b. The container shall be sealed, in such a manner, that the seal must be broken in order to open the container. The seal shall bear the same unique identification as the container or the container (if feasible) shall be clearly marked with the seal's identification, if different than the container.
   c. PIKA's Form-205A INSPECTION, CERTIFICATION, AND CHAIN OF CUSTODY will be provided to the customer and material disposal company. The following information for each container will be provided; weight of container; location where material was obtained; name of contractor, names of certifying and verifying individuals; unique

container identification; and seal identification, if required. This documentation will be included in the final report.

2.2 MARKING AND PACKAGING

Explosive free Cartridge and flare cases, fuzes, primers, boosters, practice ordnance, and small pieces/fragments from types of high explosive ordnance and other similar items DO NOT require individual marking. These items will be inspected, placed in containers, then secured or tagged with an appropriate seal or similar device having a serial number. When large amounts of residue are generated, large containers such as hoppers, securable roll-offs, conex's or other appropriate containers may be used, provided the container has a lid/cover/door that can be secured and sealed after inspection. **Any evidence of tampering after sealing will require 100% re-inspection and re-certification IAW EM 385-1-97, Change 1, Chapter 1, Section 11**. Containers will be marked as in paragraph 2.1.1.G.5.a. above. Where quantities permit, the contents will be separated by base metal type (i.e., copper, aluminum, steel, etc.) and tagged or marked to identify contents. Large materials that cannot be containerized or palletized will be individually inspected and marked similarly. Each will be tagged with a "railroad seal" or similar device having a serial number. When large items are further demilitarized, by smelting, disassembly, breaking, crushing, shredding, or cutting, additional stamping or marking of individual pieces is not required.

2.3 MATERIALS CERTIFICATION AND VERIFICATION

PIKA will make sure that materials generated from MEC project sites are properly inspected IAW the procedures above. Only UXO personnel who are qualified IAW DoD Explosive Safety Board (DDESB) Technical Paper (TP) 18 will perform these inspections. The SUXOS will certify, and the client representative, or UXOQCS, will verify, that the material is free of explosive hazards.

DD form 1348-1A will be used as documentation. DD 1348-1A forms must clearly show the typed or printed names of the SUXOS and the client representative, organization, signature, and contractor's home office and field office phone number(s) of the persons certifying and verifying the material.

a. Local directives and agreements may supplement these procedures. Coordination with the local concerns will identify any desired or requested supplement to these procedures.
b. In addition to the data elements required and any local agreed to directives, the DD 1348-1A must clearly indicate the following:
   (1) Basic material content. (Type of metal; steel, aluminum, brass, or mixed)
   (2) Estimated weight.
   (3) Unique identification of each of the containers and seals stated as being turned over.

(4) Location where material scrap was obtained. (Site or Range Number)
(5) Seal identification, if different from the unique identification of the sealed container.

c. The following certification will be entered on each DD 1348-1A for turnover of material generated from MEC operations and will be signed by the SUXOS and the client representative. If there is no client representative on the project, the SUXOS will be the certifier and the UXOQCS will be the verifier.

"This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related materials."

***Note**: This statement shall be IAW EM 385-1-97, Change 1, Chapter 1, Section 11. Specific requirements of the client may be incorporated. Chain of Custody form shall also reflect the appropriate statements for Certifier, Verifier and Final Disposition.*

2.4 DEMILITARIZATION

When required by DoD 4160.28M Volumes 1-3, or the Scope of Work where this directive is not applicable, material will be demilitarized to an acceptable standard before being released from PIKA custody. The purpose of demilitarization is to render any item unusable and/or unrecognizable as a military article. Explosives or mechanical means can be used to demilitarize an item.

Mechanical means of demilitarization must be specifically reviewed and the means and material must meet the safety requirements when considering, explosive residue's, voids, size, weight, configuration and location.

2.5 CHAIN OF CUSTODY

The containers/hoppers and individual pieces of material must be under the control and custody of PIKA from the time each is inspected and certified until each is turned over to the smelter or recycler for final disposition. PIKA Form-205A Inspection Certification and Chain of Custody Form will be used to document this chain of custody. Form-205A identifies the quantity, composition, origin, routing, and destination of each container/hopper or item during its handling and transportation life cycle. It also provides evidence that containers/lots were properly segregated and secured until final disposition. At random intervals during the scrap process, photographs of a representative sample of containers/lots will be taken by PIKA personnel to verify that this SOP is being followed.

2.6 FINAL DISPOSITION

The certified and verified materials will only be released to an organization that will:

a. Upon receiving the unopened labeled containers each with its unique identified and unbroken seal making sure there is a continued chain of custody, and after reviewing and concurring with the provided supporting documentation, sign for having received and agree with the provided documentation that the sealed containers contained no explosive hazards when received. This shall be signed on the recycler's company letterhead stating that the contents of these sealed containers will not be sold, traded or otherwise given to another party until the contents have been smelted and are only identifiable by their basic content.
b. Send follow up notification on the recycler's company letterhead and all supporting documentation to PIKA that the contents of the sealed containers have been smelted and are now only identifiable by their basic content. This will be incorporated into the final report as documentation for supporting the final disposition of this scrap metal.

3.0 REGULATORY REFERENCES

The following regulations outline requirements associated with managing munitions debris (MD)/range related debris (RRD) collected from MEC project sites:

- DoD 6055.09-M, DoD Ammunition and Explosive Safety Standards
- DoD Policy to Implement the EPA's Military Munitions Rule
- 40 Code of Federal Regulations (CFR) Part 261
- DOD 4160.28-M (Vols 1-3), Defense Demilitarization Manual
- DoD 4145.26-M, DoD Contractor's Safety Manual for Ammunition and Explosives
- DDESB TP 16, Methodologies for Calculating Primary Fragment Characteristics
- DDESB TP 18, Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel
- DA-Pam 385-64, Ammunition and Explosives Safety Standards
- OSHA Construction Industry Standard 29 CFR Part 1926, Subparts O and P, Excavations
- USACE Engineering Regulation (ER) 385-1-92, Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities
- USACE EM 385-1-97, Change 1, Explosive Safety and Health Requirements Manual
- USACE Engineering Pamphlet (EP) 1110-1-18, Ordnance and Explosives Response
- USACE EM 200-1-15, Technical Guidance for Military Munitions Response Actions
- USACE EM 385-1-1, Safety and Health Requirements Manual
- USACE ER 385-1-95, Safety and Health Requirements for MEC Operations
- The PIKA Corporate Environmental Safety and Health Plan (CESHP) and Quality Management System (QMS), and SOP's (these documents will be on site and available to site personnel during the project).

4.0 ATTACHMENTS

No attachments associated with this SOP.

1.0 SCOPE

This Standard Operating Procedure (SOP) applies to all site personnel, including contractor and subcontractor personnel, and operations involved in the conduct of uncovering, inspecting or handling of drums and containers. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 2.0 of this SOP for additional compliance issues. The purpose of this SOP is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the handling of drums or containers.

2.0 REGULATORY REFERENCES

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

1. OSHA General Industry Standard 29 CFR Part 1910.120.
2. USACE EM 385-1-1, Section 14.

3.0 RESPONSIBILITIES

3.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the personnel and equipment resources needed to implement this SOP. The PM will also determine if the requirements in this SOP are relevant to the site and will incorporate this SOP into site specific plans, procedures and training for sites where this SOP is to be implemented.

3.2 SITE SUPERVISOR

The Site Supervisor (SS) will implement this SOP for operations that involve site operations involving drum and container handling and removal. The SS will also discuss the relevant sections of this SOP in the daily safety briefings. The SS will document information related to the daily implementation of this SOP in appropriate site documentation logs and forms.

3.3 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA Corporate Environmental Safety and Health Program, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.

2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to the implementation of this SOP and the protective measures used to safeguard site personnel.
4. Periodically auditing PIKA work sites to determine compliance with this SOP.

3.4 SITE SAFETY AND HEALTH OFFICER

The Site Safety and Health Officer (SSHO) will be responsible for assisting the SS and site personnel with the identification of safety and health hazards and the use of control techniques associated with this SOP. The SSHO will assist the SS with the discussion of the requirements in this SOP during the initial site hazard training and the daily safety briefings. The SSHO will inspect site operations and conditions to make determine their initial and continued compliance with this SOP and other regulatory guidelines.

4.0 PROCEDURE

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

4.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

This SOP is designed to provide site personnel with effective means of controlling the hazards encountered during the handling of drums and other waste containers encountered or generated during hazardous waste site operations. This SOP also outlines the effective engineering controls, safe work practices, and personal protective equipment (PPE) to be used in drum/container handling. This SOP shall be applicable to site operations where the handling of drums and containers is required during the conduct of site activities as outlined in this SSHP. These procedures apply to both hazardous waste drums/containers discovered on site, and drums/containers of waste generated during site activities.

4.2 GENERAL REQUIREMENTS

The following general requirements shall be followed or incorporated during the discovery, inspection, transportation and disposal of drums/containers of hazardous substances and waste:

1. Prior to handling drums or containers, all employees shall be warned of the potential physical and chemical hazards associated with the contents and the handling of the drums or containers.

2. Drums/containers used for the collection or transfer of waste materials shall meet the appropriate, DOT, OSHA, and EPA regulations for the wastes that they contain.
3. The SS and SSHO will coordinate to organize drum/container operations to minimize the amount of drum or container movement.
4. Unlabeled drums and containers located on site shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.
5. Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound, approved container using a device classified for the material being transferred.
6. Fire extinguishing equipment meeting the requirements of 29 CFR Part 1910, Subpart L, shall be on a hand and ready for use to control incipient fires.
7. Material handling equipment used to transfer drums and containers shall be selected, positioned and operated in such a manner as to minimize sources of ignition, related to the equipment, from igniting flammable gases and vapors.
8. Where an airline respirator system is used for any drum/container related activity, connections to the source of air supply shall be protected from contamination and the entire system shall be protected from physical damage.
9. The flow chart found in Figure 404-1 will be used as a guide to direct the course of drum/container handling, sampling, staging, bulking and shipment procedures outlined in this ESHP.

4.3 LOCATION AND REMOVAL OF BURIED DRUMS/CONTAINERS

Caution shall be used when buried drums or containers are to be located and removed so as to protect the safety and health of on site workers, the environment and the general public. Therefore, whenever site operations require the location and removal of buried drums/containers, the procedures listed below shall be followed:

1. A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.
2. Soil or other material shall be removed with caution to prevent drum or container rupture.
3. When necessary, an observer will be stationed so as to assist the heavy equipment operator, and direct the operator in the movement of the bucket during removal of soil or covering material.
4. Excavation of soil to expose buried drums/containers shall be conducted IAW the provisions of SOP-519 Excavation and Trenching Safety.
5. If an excavation must be entered by site personnel to facilitate soil removal, inspect the drum/container, rig the drum/container for lifting, or for any other reason, the SSHO shall evaluate the excavation to determine if conditions are

safe for entry and to determine if the requirements of ESHP-504 Confined Space Entry must be implemented.

4.4 INSPECTION OF DRUMS AND CONTAINERS

Selection of drum handling, sampling and transportation procedures depends largely upon the contents and condition of the drum/container. Therefore, to the extent feasible, drums and containers shall be inspected, prior to any handling, to gain as much information as possible related to their integrity and contents. When assessing drum/container condition and integrity, the following items should be inspected and carefully documented:

1. Signs of structural deterioration, such as corrosion, rust or leaks.
2. Signs that the drum is under pressure, such as swelling or bulging.

When inspecting drums/containers to determine their possible contents, the following should be examined:

1. Symbols, words or other marks indicating the nature of its contents (e.g., radioactive, flammable, corrosive, etc.).
2. Symbols, words or other markings indicating that the contents may be discarded laboratory chemicals, reagents or other small size containers (< 5 gal. each) that are packaged together.
3. The configuration of the drumhead and the drum material (see Tables 404-1 and 404-2).

Table 404-1: Drum Configuration

Configuration	Information
Whole lid removable	Drum designed to contain solid materials.
Lid has a bung	Drum designed to contain liquids.
Drum contains a polyethylene or PVC liner	Drum may contain highly corrosive or volatile organic materials.

Table 404-2: Drum Hazards

Drum Material	Associated Hazards
Polyethylene or PVC-Lined Drums	Often contain strong acids or bases, or volatile organic materials.
Exotic Metal Drums (e.g. nickel, stainless steel, aluminum)	These drums are usually very expensive and are designed to contain extremely dangerous materials.
Single-walled Pressure Vessels	These containers have fittings for both product filling and placement of an inert gas, such as nitrogen. May contain reactive, flammable or explosive materials.
Laboratory Packs	Used for disposal of expired chemicals and process samples from laboratories, hospitals and other similar institutions. Individual containers inside are often packed in

	absorbent/protective material. Lab packs may contain a large variety of materials that may or may not be compatible when stored or mixed together, such as: flammable, shock-sensitive, highly corrosive, highly volatile, radioactive or extremely toxic materials

Drums that do not have exterior labeling indicating their contents must be assumed to contain hazardous materials, until characterized through sampling. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

4.5 OPENING DRUMS AND CONTAINERS

The act of opening a drum with unknown contents can present serious safety and health hazards. This activity requires management and site personnel to take the most conservative and protective means feasible to protect site personnel, the environment, and the general public. The guidelines listed below represent the minimum requirements to be followed during drum/container opening and may need to be amended based on updated site characterization data:

1. Employees not actually involved in opening drums or containers shall be kept a safe distance, and if possible upwind, from the drums or containers being opened.
2. If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental spill or explosion.
3. Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.
4. When there is a reasonable possibility of flammable atmospheres being present, monitoring shall be conducted to assess the atmosphere and material handling equipment and hand tools shall be of the type to prevent sources of ignition.
5. Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved, without the potential for worker exposure.
6. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the worker and the drums or containers to reduce the risk of employee injury.
7. Whenever feasible, or if required by known hazards, remote container opening equipment (see Table 404-3) will be used, and the operation will be conducted in a containment vessel designed to minimize the effects of a pressurized release or explosion.
8. Employees shall not stand upon or work from drums or containers.

4.6 HANDLING RADIOACTIVE WASTES

Drums and containers containing radioactive wastes shall not be handled until their hazard to personnel is properly assessed. This assessment of the hazards shall include determining the levels of radioactivity, the type of radioactive material expected and the potential for exposure during handling, sampling or transfer operations. If deemed appropriate by the CESHM, a Certified Health Physicist shall conduct the hazard assessment of radioactive waste drums/containers and exposure potential.

TABLE 404-3: DRUM/CONTAINER OPENING DEVICES

Remote Controlled Device	Use
Pneumatically powered impact wrench.	Designed to remove drum/container bungs.
Hydraulically or pneumatically operated drum or container pierce.	Puncture the top of the drum/container.
Backhoe bucket equipped with a non-sparking spike.	Puncture the top of the drum/container.
Pneumatically, hydraulically or electrically operated de-header.	Cuts off drum top, allowing full access to the contents, usually used on drums of solids.

4.7 HANDLING SHOCK SENSITIVE WASTES

Shock sensitive waste presents a serious threat to site workers due to the potential for explosion during drum/container opening, sampling or handling operations. As a minimum, the following special precautions shall be taken when drums and containers containing, or suspected of containing, shock-sensitive wastes are handled:

1. All non-essential employees shall be evacuated from the area prior to any operations, such as handling, opening, sampling or transfer.
2. Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.
3. An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of shock sensitive waste handling activities.
4. Continuous communications (e.g., portable radios, hand signals or telephones, as appropriate) shall be maintained between the site personnel handling the shock sensitive drums/containers and the SSHO and site supervisor, located in the support zone, until such time as the handling operation is completed.
5. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.
6. Drums and containers containing packaged laboratory wastes shall be considered to contain shock sensitive or explosive materials until they have been characterized.

Caution: Shipping of shock sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Employers and their shippers should refer to 49 CFR 173.21 and 173.50.

4.8 HANDLING OF PRESSURIZED DRUMS/CONTAINERS

Pressurized drums/containers, as evidenced by bulging or swelling, are extremely dangerous and whenever possible, should not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the material. To minimize the hazards associated with pressurized drums/containers, the following shall be observe and/or implemented:

1. If a pressurized drum/container must be moved, it will, whenever possible, be handled with a grappler unit designed for explosive containment.
2. Pressurized drums/containers shall be moved individually only as far as is needed to set them on solid ground where they can be further assessed.
3. Special engineering controls designed for splash/explosion containment shall be utilized when the pressure is released from the drum/container prior to sampling activities.
4. Overpack drums, first aid kits and fire extinguishers shall be staged near the area where pressurized drums are inspected and stored.

4.9 HANDLING LABORATORY WASTE PACKS

In addition to the requirements of paragraph 5.4 of this SOP, the following precautions shall be taken, as a minimum in handling laboratory waste packs (lab packs):

1. Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to hazards of the wastes.
2. If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.
3. Once a lab pack has been opened, a chemist or other person familiar with the identification and classification of waste chemicals shall inspect and segregate the containers inside.
4. Overpack drums, first aid kits and fire extinguishers shall be staged near the area where pressurized drums are inspected and stored.
5. Whenever possible, handle lab packs initially using a grappler unit designed for explosive containment.

4.10 SAMPLING OF DRUM/CONTAINER CONTENTS

Drum/container sampling shall be done in accordance with the sampling protocols and procedures outlined in the Work Plan (WP) or Site Safety and Health Plan (SSHP). The drum and container sampling protocols and procedures be written to meet the

requirements of the Statement of Work (SOW) and any applicable EPA sampling protocols. Along with the requirements found in the WP or SSHP, the following shall be implemented, as applicable:

1. Whenever feasible, or necessary, drums/containers will be sampled in place, or moved a minimal distance to a sampling staging area.
2. All sampling and safety equipment shall be ready and available prior to initiating sampling activities.
3. Sampling personnel shall remain at a safe distance from the drum/container opening area while opening is being conducted, and shall enter the area only after opening operations are complete.
4. Whenever feasible, remote drum/container sampling equipment will be used to prevent site personnel from having to contact the drum/container.
5. Samplers shall not stand on or lean over the drum/container while sampling.

4.11 DRUM/CONTAINER STAGING

The staging of drums/containers is a critical element of the drum/container handling procedures. If staging is necessary due to the location or number of drums/containers, a staging SOP shall be implemented which outlines the movement patterns and temporary staging areas to be used as drums/containers are processed. Prior to drum/container handling, the SSHO shall develop a site staging map (see Figure 404-2 for an example of a staging map) that will identify the location of the various staging areas around the site.

Along with the requirements outlined above, the following shall be implemented when drum/container staging is required:

1. Drum or container staging areas shall be kept to the minimum number necessary to identify and classify materials safely and prepare them for transport.
2. Staging areas shall be provided with adequate access and egress routes.
3. A system shall be developed for identifying/marking drums/containers as they are moved from one staging area to the next.
4. Drums/containers shall not be moved from one staging area to the next until all of the necessary tests/procedures for the staging area have been accomplished.

4.12 BULKING OF DRUM/CONTAINER CONTENTS

Bulking is the process where similar wastes from individual drums/containers are combined into larger containers to facilitate shipment and disposal activities. Since materials from a number of containers will be mixed together, it is imperative that the materials be of a compatible nature. The mixing of incompatible materials can cause chemical reactions resulting in fire, explosion or the liberation of toxic and flammable gases/vapors. Therefore, the bulking of hazardous wastes shall be permitted only after

the SSHO has consulted with the PIKA Certified Industrial Hygienist to determine which materials can be combined together.

4.13 SHIPPING AND TRANSPORTATION

All hazardous waste drums/containers to be shipped off site shall be handled according to the procedures specified below:

1. Drums and containers shall be identified and classified prior to packaging for shipment.
2. All hazardous waste shall be contained and/or packaged in DOT approved drums/containers.
3. All drums/containers shall be labeled IAW EPA and DOT requirements prior to shipping.
4. Site personnel shall use drum dollies, pallets and fork trucks, as appropriate, to facilitate the loading of drums/containers onto transport vehicles.
5. All required documentation, such as the EPA required Uniform Hazardous Waste Manifest (EPA Form 8700-22), shall be prepared and available to the transporter prior to loading.

4.14 TANK AND VAULT PROCEDURES

Tanks and vaults found on site require special consideration due to their size, configuration and the potential quantity of material that may be stored in them. The following shall be implemented to safely handle tanks and storage vaults found on site:

1. Tanks and vaults containing hazardous substances shall be sampled and handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.
2. Appropriate tank or vault entry will be conducted IAW procedures described in ESHP-504 Confined Space Entry whenever employees must enter a tank or vault.
3. All slings, chokers, cables, etc. used for lifting or securing tanks/vaults shall be inspected prior to use and the load/configuration capacity shall not be exceeded.

4.15 SPILL PREVENTION

Due to the potential for spills, which may result from handling deteriorated drums/containers, spill containment and collection equipment shall be located on site prior to initiating drum and container handling activities. The following shall apply when spills must be contained and cleaned up safely:

1. DOT specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.
2. Where major spills may occur, spill containment procedures, which are part of the Emergency Response Plan found in the SSHP, shall be implemented to contain and isolate spilled materials.

3. If flammable or explosive materials could be spilled, spill clean-up materials shall be spark proof, and all ignition sources shall be removed or extinguished prior to personnel engaging in clean-up activities.

5.0 SAFETY AND PPE REQUIREMENTS

The following safety measures and personal protective equipment (PPE) shall be used in preventing or reducing exposures associated with drum and container handling operations.

1. Personnel will wear the type and level of PPE specified in the SSHP.
2. Personal and work area monitoring for radiological hazards, and toxic gases, vapors and dusts will be conducted as specified in the SSHP for drum and container operations.
3. Personnel entering tanks or vaults will wear the retrieval and safety equipment specified in SOP-504 Confined Space Entry.
4. All provisions and requirements specified in other SOPs that apply to drum and container-handling operations (i.e., excavation and trenching, heavy equipment operation, etc.) shall be followed.

6.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

- The Safety Training Attendance Logs (Form-503);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Daily Task and Safety Briefing Log (Form-502); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

None.

FIGURE 404-1: DRUM AND CONTAINER HANDLING FLOW CHART

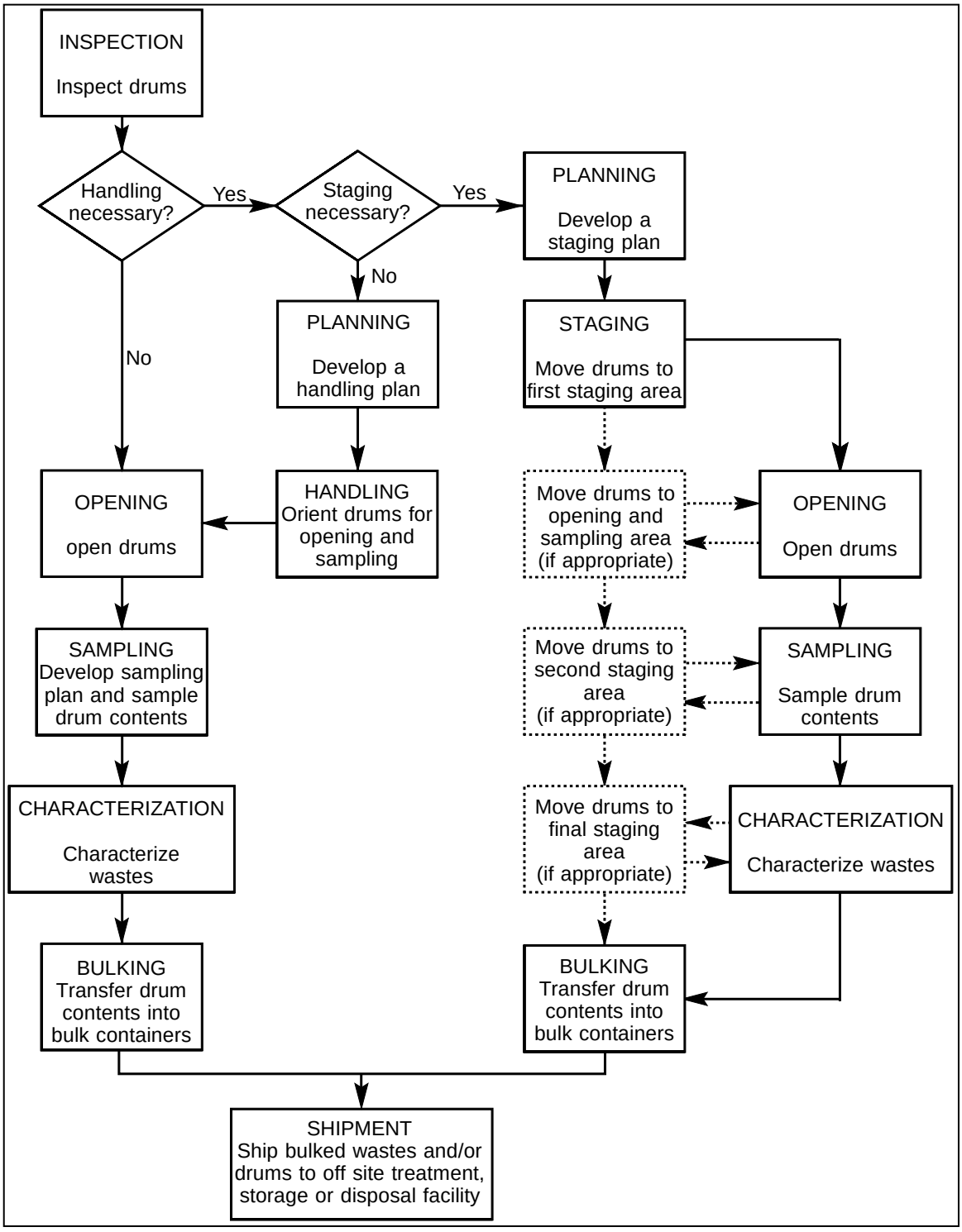
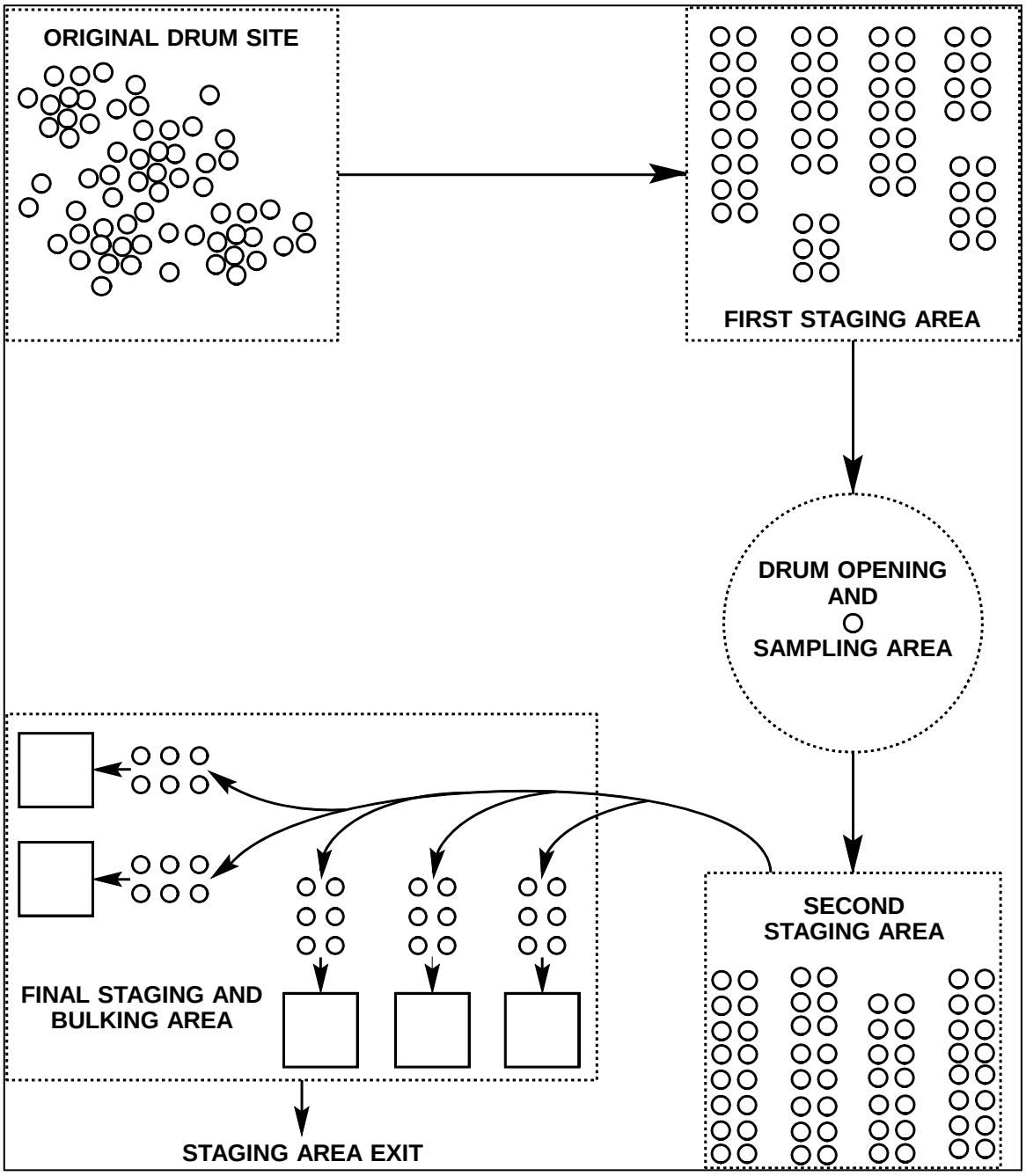


FIGURE 404-2: EXAMPLE SITE STAGING AREA MAP



1.0 PURPOSE

This Standard Operating Procedure (SOP) is designed to provide site personnel with information related to the recognition, prevention, and medical care of the most common biological hazards that may be encountered during on-site operations.

2.0 PROCEDURE

2.1 PERSONNEL TRAINING

All personnel, including contractor and subcontractor personnel, involved in operations where exposure to biological hazards exist, shall be given site-specific training related to the potential safety and health hazards associated with the biological hazards that may be encountered during site operations. Additionally, personnel will be trained in the safe work practices and control techniques to be used to reduce or eliminate the potential for exposure or the risks of exposure to biological hazards.

2.2 HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

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

2.2.1 HAZARDOUS PLANTS

The plants that present the greatest degree of risk to site personnel (i.e., potential for contact vs. effect produced) are those that produce tissue injury and skin reactions.

2.2.1.1 Plants Causing Skin and Tissue Injury

Contact with splinters, thorns and sharp leaf edges is of special concern to site personnel, as is the contact with the pointed surfaces found on branches, limbs and small trunks left by site clearing and grubbing crews. This concern stems from the fact that punctures, cuts and even minor scrapes caused by accidental contact may result in non-infectious skin lesions, and the introduction of fungi or bacteria through the skin or eye. This is especially important in light of the fact that the warm moist environment created inside impermeable protective clothing is ideal for the propagation of fungal and bacterial infection. Personnel receiving any of the injuries listed above, even minor scrapes, should immediately report to the SSHO for initial injury evaluation and care.

2.2.1.2 Plants Causing Skin Reactions

In the United States, there are five different types of poison ivy, poison oak, and poison sumac (see Figure 503-1). Each type contains the exact same substance that causes the blistering, itchy rash most people get on contact with these plants. It is called toxicodendrol or urushiol, a sticky sap in the leaves and branches of the plants. When

urushiols are exposed to the air, they quickly oxidize and turn a dark brown. This leads to a test for their presence. If a leaf is placed between two white sheets of paper and the leaf is crushed, the wet spots will turn brown in a matter of minutes. The urushiol producing plants are described below and graphically depicted in Figures 503-2 through 503-9.

1. Climbing Poison Ivy (Toxicodendron radicans) is the most widespread of the species. It is found in South Canada and throughout the eastern United States. "Radicans" means, "rooting" and refers to its aerial roots. Its many aerial roots give the vine great clinging power and the stems an almost fuzzy appearance. The vines grow almost straight up and do not twine around its support like most climbing vines. Climbing Poison Ivy can grow 10 to 20 feet high and occasionally completely envelop their support plant, thus taking on the appearance of a poison ivy "tree." Poison Ivy has compound leaves. That is, each leaf is made up of distinct parts, called leaflets. With poison ivy, there is one leaflet at the end of the leaf stalk (or petiole) and two leaflets opposite each other below the first. This is called a trifoliate pattern, but there are occasionally 5 or 7 leaflet specimens. The two lower leaflets have very short stalks and are often shaped like mittens with a lobe on one side. The flowers, which appear in June, are five-pedaled, greenish-white sweet smelling blossoms that Form between the stem and the base of the axillary petiole. The fruit (drupes) appear in July and are yellowish, spherical and about 1/4 inch in diameter. The leaves are glossy, bright green, alternate, compound (like the rest of the family) and are, naturally, highly variable in shape.
2. The Non-Climbing Poison Ivy (Toxicodendron rydbergii), is also called Rydberg Poison Ivy and was named after Per Axel Rydberg (1850-1931), an expert on Western flora. This plant was considereda sub-species until the turn of the century. It survives in the more northerly climates of Canada than T. radicans. It is found in much of the western United States, east of the Cascades but is seldom found south of the New England area, although there are a few isolated colonies on the tops of some Appalachian peaks. In the central states, this species extends down into the panhandle and trans-pecos regions of Texas.
3. Eastern Poison Oak (Toxicodendron toxicarium) has the most "oak-looking" leaves of any of the species. It usually has multi-lobed leaves, no aerial roots on the stems, and fuzzy fruits and leaves. It loves sandy soils from southern New Jersey to Florida and extending west into Texas, Oklahoma and Kansas.
4. Western Poison Oak (Toxicodendron diversilobum) is quite variable, as are most of the species in this family. Even its name, diversilobum, refers to its diverse Forms. It is occasionally lobed, often with many scallops on the edge of the leaf. Additionally, the undersides of poison oak leaves are typically covered with hair. Usually there are three leaflets but occasionally five leaflet Forms are found. There are aerial roots extending from the main stem.

5. Poison Sumac (Toxicodendron vernix) is a water loving swamp tree. Growing from 6 to 20 feet in height, the Poison Sumac is found in the east from Quebec to Florida and westward along the coast to far-east Texas. It has pinnate compound leaves (leaflets on both sides of a common stalk) with from 5 to 13 smooth leaflets per stalk. It is also often mistaken for the Smooth Sumac, the Stag Horn Sumac, and Flame-Leaf Sumac. Like many of the look-alikes, poison sumac has tiny, sweet smelling flowers in the spring. It is brightly covered with red and yellow leaves in the fall, but only Poison Sumac has cream-colored berries. Also, with poison sumac, look for the fruit that grows between the leaf and the branch. Nonpoisonous sumac has fruit growing from the ends of its branches.

If a person is sensitized (allergic) to this sap (and more than 50% of people are), the rash breaks out after about 12-72 hours, but only on areas that directly contacted the resin. This is called rhus dermatitis. When you are exposed to urushiols, the reaction usually progresses in three stages. (1) A day or two after contact the infected area begins to itch and becomes red from the dilation of blood vessels. Swelling (lymph leaking from the blood vessels) also occurs. (2) Two days later, small blisters filled with lymph begin to appear. (3) Lastly large blisters burst and begin to ooze for about four days. Within 2 to 4 weeks, the skin begins to heal if the effected person has refrained from scratching the affected areas. Prevention of scratching is the hard part but it is very important. Secondary infections such as impetigo can occur.

There is a large misconception that the ooze from the blisters is infectious. The rash spreads only by spread of the invisible sap on the skin, not by leaking blister fluid from the rash itself. The reason the rash often continues to break out in new areas beyond 72 hours is that people unknowingly continue to contact it from unwashed clothes (especially shoes and laces), equipment, etc. Preventative measures that can prove effective for most site personnel are presented below:

1. Avoid contact with any poisonous plants on-site. Identify, report and mark poisonous plants found on-site.
2. Wash hands, face or other exposed areas at the beginning of each break period and at the end of each workday. Wash hands, face and other skin surfaces with the Oak/Ivy Cleanser provided on-site on a frequent basis. A degreasing soap such as Dawn™ dishwashing soap or degreasing soaps available from auto parts stores can also be used. These soaps are effective against the oil-based toxins, but can also be harsh on skin. Use of oil replenishing hand lotions can counter the effects of the soaps.
3. Avoid contacting tools and equipment with the poisonous plant, and wash any contaminated tools, equipment and clothing on a daily basis with a degreasing soap or other wash solution.

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

Treatment for urushiol exposure should start as soon after exposure as possible. Urushiols can bind with the skin within 10 minutes. Oak/Ivy cleansers provided on site should be used frequently, especially before breaks and prior to leaving the site. A quick rinse with rubbing alcohol or even Clorox (mixed one part Clorox to 9 parts water) should be followed by rinsing with cold water (warm water will spread the oils). Do not wipe exposed areas with a rag as this will spread the oils. Calamine lotion helps reduce the itch and absorbs the oils, and oral antihistamines can provide some relief from both the itching and swelling. Cortisone creams usually are not strong enough in the beginning but will help block the itch about two weeks into the rash. Jewelweed has also been shown to be an effective poison ivy cure as well as a natural plant remedy for poison oak, stinging nettle, acne, hives, insect bites and most skin irritations. Jewelweed extract instantly goes to work to cure poison ivy rash by counteracting the effects of urushiol, easing itch and promoting healing of blisters.

2.3 SNAKES

2.3.1 GENERAL INFORMATION

The potential for contact with poisonous snakes becomes a very real danger when site activities are conducted in warm weather on sites that are located in wooded grassy or rocky environments. During the warm months, extreme caution must be exercised when conducting site operations around areas where snakes might be found (i.e., rocks, bushes, logs, or in holes, crevices, and abandoned pipes). If poisonous snakes are identified on-site, PIKA shall issue protective clothing, such as snake leggings, to site personnel.

With the exception of the coral snake, the venomous snakes that may be encountered belong to the pit viper group, meaning they have large triangular shaped heads with sensor pits on both sides of the head between the eye and nostril. Pit vipers also have vertical (catlike) pupils. Brief descriptions of the most common snakes that may be encountered on site are presented below, with pictures of the snakes presented in Figures 503-10 through 503-16.

2.3.2 EASTERN DIAMONDBACK

The Eastern diamondback (Figure 503-10) is one of the largest North American snakes, with a record length of 8 feet. However, they are usually 33 to 72 inches in length. The snake has a large head and a bulky body. It has a row of large dark diamonds with brown centers and cream borders down its back. The background color of the body ranges from olive, to brown, to almost black. The tail is usually a different shade,

brownish or gray, and banded with dark rings. At the end of the tail is a well-developed rattle. The head has a light bordered dark stripe running diagonally through the eye. It is at home in the palmetto flatwoods and dry pinelands of the South. Their individual dispositions vary. Some snakes will permit close approach without making a sound, whereas others, completely concealed, will rattle when dogs or persons are 20 or 30 feet away. Frequently they take refuge in burrows of mammals as well as holes beneath stumps, etc. Its range is the coastal lowlands from southeast North Carolina to extreme east Louisiana, and all of Florida.

2.3.3 WESTERN DIAMONDBACK

The Western Diamondback Rattlesnake (Figure 503-11) ranges from central and western Texas, through southern New Mexico and Arizona, and into southern California. It also extends well into central Mexico. The Western Diamondback has a plump body, short tail, and a broad triangular head. It can reach lengths up to six feet and like pit vipers, it has a pit organ situated in an indentation of the upper jaw, between the nostril and eye. The western diamondback can be a yellowish gray, pale blue, or pinkish ground color. The diamond shapes down its length are dark with pale white borders. The tail is white with jet-black rings. The head markings include a pale oblique band from nostril to upper labials, and a similar but narrower band behind the eye. Western Diamondback Rattlesnakes inhabit dry, rocky, shrub-covered terrain where they can conceal themselves inside crevices in the rocks or in mouse holes, and prefer desert areas, temperate grasslands, and chaparrals.

2.3.4 TIMBER AND CANEBRAKE RATTLESNAKES

The timber rattlesnake and canebrake rattlesnakes (Figure 503-12) are large snakes ranging from 30-45 inches in length. They exhibit sexual dimorphism; the males are larger, weighing around 2.0 lb. while the females weigh on an average 1.3 lb. There are two color morphs, black and yellow. The background color of the black morph is gray and the patterns are a rich, velvety black. The background color of the yellow morph is tan, the patterns are a sulfur yellow tinged brownish in patches. The snakes have transverse bands of color that vary geographically, and with the eastern, western, and southern types of timber rattlesnake they are easily recognized. It is typically found in temperate forests. In the north, timber rattlesnakes live in forested rocky hills. In the southern regions, the snakes are found in uninhabited swampy areas. Crevices in rocky cliffs usually facing south or large boulders piled together make up the hibernating dens.

2.3.5 COPPERHEAD

The copperhead (Figure 503-13) has an average adult length of 22-36 inches, and is a stout-bodied snake. The head of the Northern Copperhead is a red, copper color with the rest of its body being pinkish to gray-brown with a dark chestnut colored hourglass

shaped pattern. The hourglass pattern is narrow on the top of its back and wider on its sides. The underside, belly area, of the northern subspecies is dark. Southern Copperhead is similar to the northern copperhead but the coloration is paler and the cross bands fail to meet at the midline. Also the belly of the southern subspecies is light in color. Broad-banded Copperheads have bright coloration with a sharp contrast between the pattern and the ground color. The cross bands are very broad at the midline and always meet. The belly is dark. Copperheads prefer terrestrial to semi-aquatic habitats, which include rocky-forested hillsides and various wetlands. They have also been known to occupy abandoned and rotting slab or sawdust piles. The copperhead is the cause of many snake bites yearly, but they are rarely fatal. Bites occur by accidentally stepping on or touching the snake, which tends to be well camouflaged with its surroundings.

2.3.6 COTTONMOUTH

The cottonmouth, also called a water moccasin, (Figure 503-14) has an average adult length of 20-48 inches with a heavy body. The back of the cottonmouth is dark olive or black, and the belly is paler. On young animals, the back is marked by bands with dark borders and paler centers. This pattern is usually lost in older individuals. The snout is always pale, and there is usually a dark vertical line by each nostril. The banding pattern in the young may be striking. The cottonmouth resides mainly in the southeastern United States. Cottonmouths are semi-aquatic and can be found near water and fields. They inhabit brackish waters and are commonly found in swamps, streams, marshes and drainage ditches in the southern lowlands of the United States. They also live at the edges of lakes, ponds and slow-moving streams and waters. They sun themselves on the branches, logs and stones at the edge of the water

2.3.7 PIGMY RATTLESNAKE

The pigmy rattlesnake (Figure 503-15) can be found in the southeastern portion of North America in the following states: North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky, Tennessee, Louisiana, Arkansas, Texas, Oklahoma, and Missouri. A tiny rattle and a skinny tail can characterize the pigmy rattlesnake. The tail rarely has more than a few rattles. This combined with the fact that the rattle is so small causes the sound of the rattle to be similar to the buzzing of an insect. The average size of this relatively small snake is 12-24 inches. The background color of the Pigmy Rattlesnake can vary greatly depending on the location and subspecies. The background color can vary from shades of gray, brown, or black, to even pinkish or reddish. In these species, a dark line runs vertically through the eye that looks similar to the eye of a cat. This line also extends down the side of the face. There is a series of dark, circular spots that mark the center of the back. Along the mid-body line, there is a thin reddish-orange stripe. Along each side of the body, you can find dark spots similar but smaller than the dorsal spots. Young pigmy rattlesnakes are characterized by a

sulfur yellow tip on the tail, as well as a smaller size. The rest of the colorings and markings resemble those of the adult. It is found in a variety of habitats that include: rocky and partially wooded hillsides, pine woodlands, along riverbanks, and marshes. The one trait that these habitats must have in common is that they are in close proximity to water, and are seldom found in dry habitats. Since the pigmy rattlesnake lives near water, it is a good swimmer. It can often be found in underground retreats and burrows. These burrows are not dug by the snakes, but by small mammals or by the golfer tortoise if it is native to the habitat

2.3.8 EASTERN MASSASAUGA

Eastern Massasauga (Figure 503-16) rattlesnake has a geographic range from the Great Lakes to Arizona. They are small, usually 20-30 inches length, occasionally up to 37 inches. The snake has a row of dark blotches on the back, and three rows of smaller blotches on each side of body. The background color is gray or brownish gray. The belly is black, marked with a white or yellow pattern. Some individuals are black and lack a pattern entirely. The massasauga rattlesnake inhabits marshes and swamps in temperate forests, rainforests and temperate grasslands. They sometimes wander into upland meadows and woods in the summer. The eastern massasauga rattlesnake is the only venomous snake in the state of Michigan.

2.3.9 CORAL SNAKE

The coral snake (Figure 503-17) is classed with several Old World species like the neurotoxic cobras, kraits, and mambas. Most coral snakes are marked with a pattern of brightly colored rings or bands that are black, yellow, and red, with the red band touching the yellow band. Two species of coral snake are found in the United States: the Eastern coral snake, of the southeastern states; and the smaller Western coral snake, found from the southern parts of New Mexico and Arizona to northwestern Mexico. Both species have slender heads and bodies and tend to be secretive and nocturnal, spending much of their life underground in cracks and crevices. However, coral snakes can sometimes be seen after rains, on overcast days, and in the early morning or late evening. The Eastern coral snake is relatively large—often more than 24 inches in length—and lives in many habitats, including pine woods and hardwood forests. The Western coral snake is smaller, rarely reaching more than 20 in, and lives in dry habitats. When threatened, coral snakes usually curl their tails into a tight spiral and hold them upright. The grooved jaw, along with tiny hollow fixed fangs, assures that the coral has a poor delivery system for getting its venom into the victim. However, the coral snake does not have to "chew" its victim to inflict a painfully venomous bite, contrary to popular myth.

2.3.10 BITE RESPONSE

At no time should personnel place their hands in areas they cannot see, such as under rocks, fallen trees, dense brush, etc. Site personnel will immediately report to their team leader and the SSHO any sighting or encounter with venomous snakes. The procedures to be followed in the event a snake bites someone are:

1. Transport the victim to medical attention immediately.
2. Cover the bite with a clean dry dressing.
3. **Do not cut "Xs"** over the bite area, as this will intensify the effect of the venom.
4. **Do not** apply a tourniquet since this will concentrate the venom and increase the amount of tissue damage in the immediate area.
5. If possible, identify the snake so proper selection of anti-venom can be made. If the snake is killed, use extreme caution since the head of a dead snake is still capable of biting and injecting venom.
6. **Do not** allow the victim to run for help since running increases the heart rate and will increase the spread of the venom throughout the body.
7. Keep the victim calm and immobile.
8. Have the victim hold the affected extremity lower than the heart while waiting for medical assistance.
9. If the bite is on the hand or arm, remove any rings, watches or tight clothing.

2.4 TICKS

2.4.1 General Hazard/Disease Information

The Center for Disease Control (CDC) has noted the increase of Lyme disease and Rocky Mountain Spotted Fever (RMSF) that are caused by bites from infected ticks that live in and near wooded areas, tall grass, and brush.

Lyme disease has occurred in most states, with the heaviest concentrations in the Northeast (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania), the upper Midwest (Minnesota and Wisconsin), and along the northern California coast. It is caused by infection by the black-legged tick (Figure 503-18), deer ticks and the lone star ticks which have become infected with spirochetes.

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

The first symptoms of either disease are flu-like chills, fever, headache, dizziness, fatigue, stiff neck and bone pain. If a site employee believes a tick has become embedded then the employee will follow the current CDC guidance on removing ticks as outlined on CDC.gov *(if removed within 36hrs then the mechanism required for disease*

transmission has likely not occurred) and will report the occurrence to the SSHO immediately. If any symptoms noted above appear, or if the employee feels a tick has been embedded for more than 36hrs *(even if it has since been removed)*, they will immediately contact the SSHO, who will immediately contact the CESHM and Work Care for a phone consultation with the employee.

2.4.2 Protective Measures

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

1. When in the field, check yourself often for ticks, particularly on your lower legs, groin, armpits and areas covered with hair.
2. *It is of the utmost importance that all employees conduct a thorough tick check each evening so as to ensure no embedded ticks are left exposed to an employee for 36hrs or more (if removed within 36hrs then the mechanism required for disease transmission has likely not occurred)……this must be enforced!!*
3. Site personnel should use a DEET containing (vapor-active) repellant on any exposed skin surfaces (except eyes and lips), and apply permethrin containing spray to field clothing (but not your skin). Personnel shall allow the permethrin to dry before using the treated clothing.
4. When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
5. Tuck pant legs into boot tops or tape pants to boot tops to avoid ticks from crawling up the pant leg (this may not be an option at sites where extreme heat stress is anticipated).
6. If dressed in Level D or Modified Level D, and no other head protection is required, wear a hat to prevent ticks from getting into the hair (again, use caution as this may enhance heat stress).
7. If you find a tick, remove it by pulling on it gently with tweezers, making sure to grasp the tick close to the head, and avoid squeezing the body.
8. Do not use matches, a lit cigarette, nail polish or any other type of chemical to "coax" the tick out.
9. Be sure and remove all parts of the tick's body, and disinfect the area with alcohol or a similar antiseptic after removal.
10. For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area, frequently seen with a small welt in the center.

11. Look for the signs of the onset of RMSF, such as an inflammation that is visible in the form of a rash comprised of many red spots under the skin, which appears three to 10 days after the tick bite.

2.5 BEES, HORNETS AND WASPS

Contact with stinging insects like bees, hornets and wasps may result in site personnel experiencing adverse health effects that range from being mildly uncomfortable to being life threatening. Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are as follows:

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

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

1. If a worker knows that he is hypersensitive to bee, wasp or hornet stings, they must inform the SSHO of this condition prior to participation in site activities;
2. All site personnel will be watchful for the presence of stinging insects and their nests, and shall advise the SSHO if a stinging insect nest is located or suspected in the area;
3. Any nests located on-site shall be flagged off and site personnel shall be notified of its presence;
4. If stung, site personnel shall immediately report to the SSHO to obtain treatment and to allow the SSHO to observe them for signs of allergic reaction; and
5. Site personnel with a known hypersensitivity to stinging insects shall be required to obtain emergency medications from their physician, such as epinephrine

injectors, and will keep the medication on or near their person whenever they are working on site during seasons when bees, wasps or hornets may be present.

2.6 BITING INSECTS

2.6.1 General Information

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

2.6.2 Black Widow Spider

The black widow (Figure 503-19) is a coal-black bulbous spider 3/4 to 2 inches in length, with a bright red hour-glass on the underside of the abdomen. The black widow is usually found in dark moist locations, especially under rocks, and rotting logs. They may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the signs or symptoms listed below:

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

2.6.3 Brown Recluse

The brown recluse (Figures 503-20 and 21) is brownish to tan in color, rather flat, 2 to 5/8 inches long with a dark brown "violin" shape on the underside. It may be found in trees, or in dark locations. Victims of a brown recluse bite may exhibit the signs or symptoms listed below:

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

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

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

2.7 SCORPIONS

Scorpions are basically night animals and contact with humans is usually in the Form of a person disturbing a scorpion in its day-time hiding place, which may include gloves or boots/shoes left unattended overnight. Scorpions are most commonly observed in the Gulf States and southwest, but are also seen in the south and southeast. In the United States, the most commonly encountered scorpion is the "bark scorpion" (Figure 503-22), referred to as such due to their preference for hiding under the loose bark of trees or in dead trees/logs. However, a wide variety of scorpions are present, to include the Southern Devil Scorpion (Figure 503-23). Scorpions are usually flat, straw to reddish brown in color, and range in size from 3/4 to 3 inches in length and are distinguishable by their long telson (tail) that ends in a curved stinger, and their pincher like claws. The scorpion venom of some species is capable of causing death in young or old people, and may cause severe adverse health effects in adults. The signs and symptoms typically associated with scorpion envenomation are highly variable depending upon the species involved, and may only involve localized pain/swelling. However, scorpion stings may cause any or all of the signs or symptoms listed below.

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

There is no effective first aid treatment for scorpion stings, however, with very young and very old victims, or for severe envenomation, an attending physician may give polyvalent scorpion anti-venom. Due to the variation in signs/symptoms that may result, any victim of a scorpion sting should be transported to a medical facility for observation and treatment. If possible, capture the scorpion for later identification at the medical facility. If scorpions are suspected or known to be on site, the SSHO shall brief the site personnel as to the identification and avoidance of the scorpions. As with other stinging insects, site personnel should report to the SSHO if they locate scorpions or notice any type of bite while involved in site activities.

2.8 ULTRAVIOLET RADIATION FROM SUNLIGHT

2.8.1 Skin Affects Resulting from Exposure

Ultraviolet (UV) radiation produces chemical changes in the skin cells, which vary dependent upon the time of year, geographic location, hour of the day and personal susceptibility. Generally after initial exposure to sunlight, a reddening of the skin may occur, but normally does not appear for several hours after exposure. This reddening is associated with "sunburn" and may cause pain, discomfort and limit the capabilities of site personnel. If the exposure has been excessive, blistering and peeling of the outer layer of the skin may accompany the reddening of the skin. Another hazard associated with skin exposure to UV radiation from the sun is the production of skin cancer.

2.8.2 Effects of Eye Exposure

Unprotected exposure to strong sunlight may cause photokeratitis (inflammation of the cornea), photoconjunctivitis (inflammation of the outer membrane of the eye), and in sensitive persons, the potential for cataracts increases and retinal damage may occur. Unprotected exposure to bright sunlight may cause acute physiological effects such as partial to complete closure of the eyelids (squinting), watering/tearing of the eyes and visual discomfort.

2.8.3 UV Protective Measures

Upon exposure to hazardous levels of sunlight, the skin's self-defense mechanism is activated. This mechanism involves a pigment in the skin, called melanin, which, upon exposure to the sun, rises to the surface of the skin giving it a tan coloration (suntan), and new melanin is produced in the lower regions of the skin. The melanin in the skin absorbs UV radiation and acts as a protective layer over the skin regions below. To further decrease the potential of receiving harmful exposures from the sun, the work practices listed below should be implemented during site activities where personnel exposures to hazardous levels of sunlight may occur:

1. Skin exposure to strong sunlight should be minimized through the use of clothing and exposure periods gradually increased during initial annual exposure;
2. Sunscreen lotions with a skin protection factor (SPF) rating of at least 30 should be applied to exposed areas of the skin prior to initiation of daily operations, and re-applied periodically throughout the day since sweating may remove or dilute the lotion and reduce its effectiveness;
3. When feasible, work areas should be shaded using tarpaulins or tents to protect workers from direct exposure to sunlight;
4. Mesh hats should be used to help shade and protect the eyes; and
5. For eye protection to bright sunlight, safety glasses with tinted lenses shall be used which meet the requirements of the American National Standards Institute (ANSI) Z80.3-1986 and Z87.1-1989 Standards.

2.9 INFECTIOUS HAZARDS

2.9.1 Medical Wastes

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

1. Contact with contaminated sharps (needles, scalpels, etc.).
2. Exposure to blood or other body fluids.
3. Exposure to waste infected with viruses or bacteria.
4. Exposure to other types of biological hazards such as fungi, parasites, or experimental biological agents, etc.

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

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

2.9.2 Hantavirus

2.9.2.1 Hazard Description

In June of 2002, the Center for Disease Control published a map of the United States indicating the number of cases of Hantavirus pulmonary syndrome (HPS) by state of residence. This map is presented in Figure 503-24 of this SOP. In the United States, deer mice (plus cotton rats and rice rats in the southeastern states and the white-footed mouse in the Northeast) are the rodents carrying Hantaviruses that cause HPS. These rodents shed the virus in their urine, droppings and saliva. The virus is mainly transmitted to people when they breathe in air contaminated with the virus. This happens when fresh rodent urine, droppings or nesting materials are stirred up and dust, and possibly water droplets, containing the virus get into the air where they can be inhaled. There are several other ways rodents may spread Hantavirus to people:

- If a rodent with the virus bites someone, the virus may be spread to that person—but this is very rare.
- Researchers believe that you may be able to get the virus if you touch something that has been contaminated with rodent urine, droppings or saliva, and then touch your nose or mouth.
- Researchers also suspect that if virus-infected rodent urine, droppings or saliva contaminates food that you eat, you could also become sick.

Transmission can happen at any place that infected rodents have infested. Remember, the term "carrier rodent" means deer mice plus cotton rats and rice rats in the Southeast, and the white-footed mouse in the Northeast. Common house mice do not carry Hantavirus.

2.9.2.2 Early Symptoms

Early symptoms include fatigue, fever and muscle aches, especially the large muscle groups—thighs, hips, back, sometimes shoulders. There may also be headaches, dizziness, chills and/or abdominal problems, such as nausea, vomiting, diarrhea and abdominal pain.

Since there have been so few cases of HPS, it isn't quite clear what the "incubation time" is. However, it appears that symptoms may develop between 1 and 5 weeks after exposure to potentially infected rodents and their droppings.

2.9.2.3 Late Symptoms

Four to 10 days after the initial phase of illness, the late symptoms of HPS appear. These include coughing and shortness of breath, with the sensation of having a tight band around the chest causing labored breathing as the lungs fill with fluid.

2.9.2.4 Prevention

To avoid risk of contracting the Hantavirus, use a hose spray or spray bottle of dilute water/bleach solution (5:1) to wet down any work areas where there is evidence of infestation or mouse droppings. Then, while wearing protective clothing, boots, gloves, and a high efficiency particulate air (HEPA) filtered respirator (i.e., a N-100 or P-100 filter), wipe the sprayed surface clean. Personnel shall never clean droppings or dead mice with a blower, vacuum, or hand broom. Dispose of dead mice by dampening the body with the spray solution, picking it up with gloves, and placing it into a plastic bag. Additional precautions for those that may be occupationally exposed to the Hantavirus include:

- Workers in potentially high-risk settings should be informed about the symptoms of the disease and be given detailed guidance on prevention measures.

- Workers who develop a febrile or respiratory illness within 45 days of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of potential Hantavirus infection. The PIKA CESHM will also be informed when the initial visit is conducted.
- Workers should wear a half-face air-purifying (or negative-pressure) respirator or PAPR equipped with HEPA filters when removing rodents from traps or handling rodents in the affected area.
- Workers should wear rubber or plastic gloves when handling rodents or handling traps containing rodents. Gloves should be washed and disinfected before removing them, as described above.
- Waste contaminated by rodent urine or feces should be disinfected with a commercial disinfectant or bleach solution. Dispose of dead rodents in plastic bags as described above.

2.9.3 Histoplasmosis

Histoplasmosis is an infectious disease of the lungs caused by a fungus called Histoplasma capsulatum. *H. capsulatum* grows in soils throughout the world. In the United States, the fungus is endemic and the proportion of people infected by *H. capsulatum* is higher in central and eastern states, especially along the valleys of the Ohio, Mississippi, and St. Lawrence rivers, and the Rio Grande. Droppings from chickens, pigeons, starlings, blackbirds, and bats support its growth.

To multiply, Histoplasma capsulatum produces small spores called conidia. The conidia of Histoplasma capsulatum are only two millionths of a meter (microns, μm) in diameter. When these conidia are inhaled, they are small enough that they enter the lungs and start an infection.

Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects), or they experience symptoms so mild they do not seek medical attention and may not even realize that their illness was Histoplasmosis. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. A chest X-ray can reveal distinct markings on an infected person's lungs.

Chronic lung disease due to Histoplasmosis resembles tuberculosis and can worsen over months or years. The most severe and rarest form of this disease is disseminated Histoplasmosis, which involves spreading of the fungus to other organs outside the

lungs. Disseminated Histoplasmosis is fatal if untreated, but death can also occur in some patients even when medical treatment is received.

Impaired vision and even blindness develop in some people because of a rare condition called "presumed ocular Histoplasmosis." Results of laboratory tests suggest that presumed ocular Histoplasmosis is associated with hypersensitivity to *H. capsulatum* and not from direct exposure of the eyes to the microorganism.

The best way to prevent exposure to *H. capsulatum* spores is to avoid situations where potentially contaminated material can become aerosolized and subsequently inhaled. A brief inhalation exposure to highly contaminated dust may be all that is needed to cause infection and subsequent development of Histoplasmosis. Therefore, work practices and dust control measures that eliminate or reduce dust generation during the removal of bat or bird manure from a building will also reduce risks of infection and subsequent development of disease.

Persons working in contaminated areas should use protective clothing such as gloves and Tyvek coveralls. They should also use a respirator equipped with a high efficiency particulate air (HEPA) filter that is capable of filtering particles down to two microns in size. Such respirators are suitable, however, for major clean-up operations of prolonged exposure, a powered air purifying or supplied air respirator may be necessary.

3.0 REFERENCES

With the exception of the Occupational Safety and Health Administration (OSHA) General Duty Clause found in paragraph 5(a)(1) of the original Occupational Safety and Health Act which states that employers shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm, there are no Federally regulated references that govern the conduct of operations on sites with biological hazards. However, for sites where the U.S. Army Corps of Engineers (USACE) requirements are applied, the reference outlined below will be used:
USACE EM 385-1-1, Section 06.D, Harmful Plants, Animals, and Insects.

4.0 ATTACHMENTS

Figures 503-1 through 503-24

Figure 503-1: Poison Ivy, Oak and Sumac Leaves and Ranges

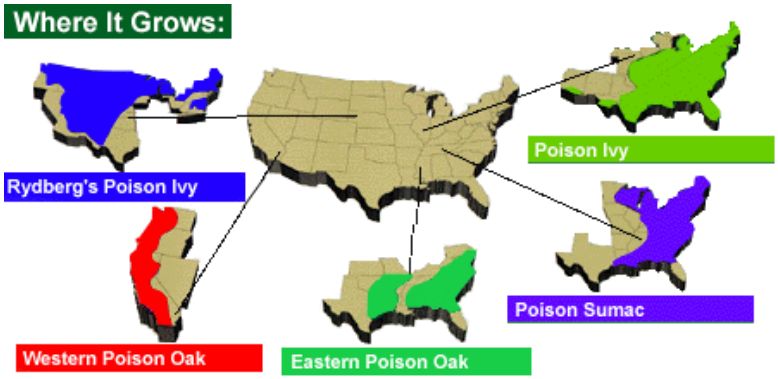


Figure 503-2

Figure 503-3

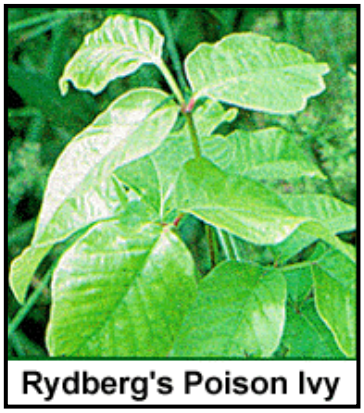


Figure 503-4

Figure 503-4

Figure 503-5

Figure 503-6 Poison Ivy Rootlets

Figure 503-7:
Poison Ivy Fall Colors

Figure 503-8:
Poison Oak Fall Colors

Figure 503-9:
Poison Ivy Berries

Figure 503-10: Eastern Diamondback

Figure 503-11: Western Diamondback

Figure 503-12: Canebrake (l) & Timber (r) Rattlesnakes

Figure 503-13: Copperhead

Figure 503-14: Cotton Mouth

Figure 503-15: Pigmy Rattlesnake

Figure 503-16: Eastern Massasauga

Figure 503-17: Coral Snake

Figure 503-18: Ticks

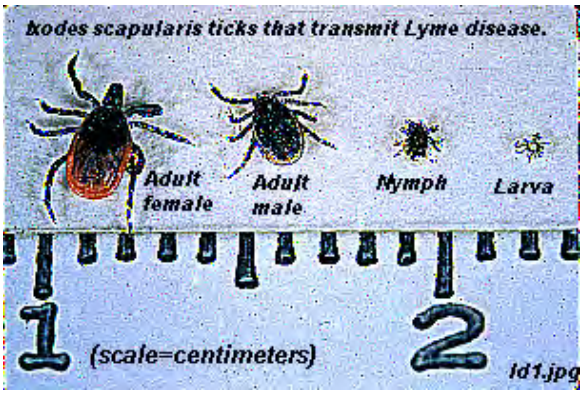


Figure 503-19: Black Widow Spider

Figure 503-20: Brown Recluse

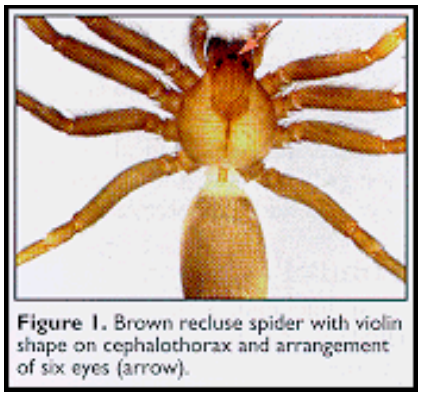


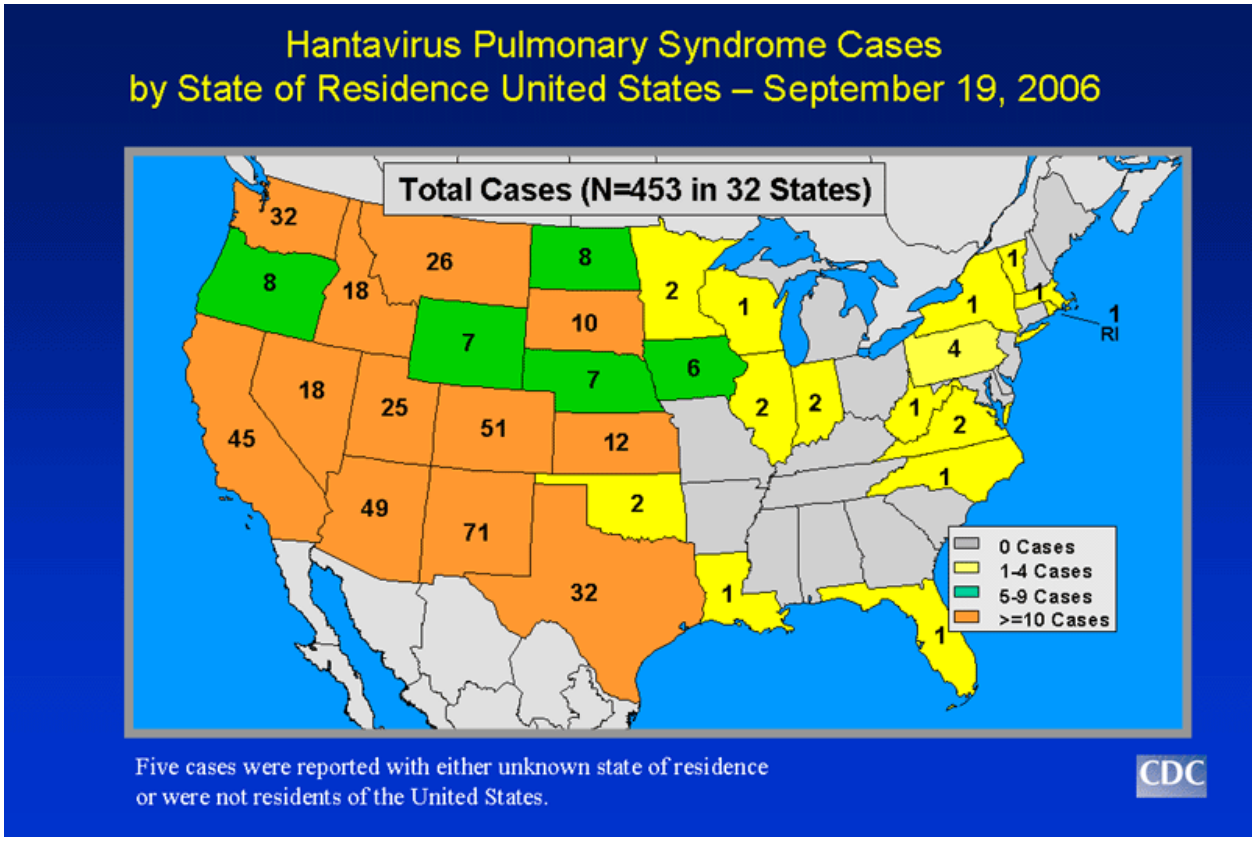
Figure 1. Brown recluse spider with violin shape on cephalothorax and arrangement of six eyes (arrow).

Figure 503-21: Brown Recluse

Figure 503-22: Bark Scorpion

Figure 503-23: Southern Devil Scorpion

Figure 503-24: Incident of Hantavirus Cases by State



1.0 PURPOSE

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

2.0 PROCEDURE

2.1 HEAT STRESS DISORDERS: SIGNS, SYMPTOMS, AND FIRST AID *(AMERICAN HEART ASSOCIATION AND AMERICAN RED CROSS GUIDELINES FOR FIRST AID)*

Employees must immediately report to the Site Supervisor (SS) or to the Site Safety and Health Officer (SSHO) any symptoms or signs of heat illness experienced by themselves or observed in co-workers. Regardless of the worker's protests, no employees with any symptoms of possible serious heat illness should be sent home or left unattended without medical assessment and authorization.

2.1.1 Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet chafing clothes.

Signs and Symptoms: The condition is characterized by a localized red skin rash and reduced sweating. Aside from being a nuisance, the ability to tolerate heat is reduced.

First Aid: Remove clothing from affected area. Wash skin with mild soap and water, rinse clean, and allow it to dry thoroughly.

2.1.2 Heat Syncope (Fainting)

Heat syncope is a loss of consciousness because of low blood pressure. Heat causes the blood vessels to expand (dilate), so body fluid moves into the legs by gravity, which causes low blood pressure and may result in fainting. Heat syncope can be caused by blood pooling in the legs after standing still for a long time in a hot environment. It can also be caused after vigorous physical activity for two or more hours.

Signs and Symptoms: Feeling faint or lightheaded; pale, cool, and moist skin; lightheadedness when changing position, such as moving from a lying position to a standing position.

First Aid: Remove worker to a cool, shaded place. Give sips of cool water. Loosen tight clothing. Remove perspiration-soaked clothing. Place the worker in a seated or supine position with legs raised. Apply cool, wet towels to the skin. Fan the person. Watch for signs of heat stroke.

2.1.3 Heat Cramps

Heat cramps are caused by a rate of perspiration that is not balanced by adequate fluid and electrolyte intake. Heat cramps can be caused by both too much and too little salt, but the primary cause is lack of water replenishment. The occurrence of heat related cramps is an indication that heat exhaustion or heat stroke may occur soon.

Signs and Symptoms: Muscle spasms and pain in the extremities and abdomen.

First Aid: Remove worker to a cool place and give sips of cool water. Watch for signs of heat exhaustion or stroke. Stretching, icing, and massaging the painful muscles may be helpful.

2.1.4 Heat Exhaustion

Heat exhaustion is an early indicator that the body's cooling system is becoming overwhelmed. This condition leads to inadequate blood supply to working muscles and cardiac insufficiency.

Signs and Symptoms: Cool, moist, pale, ashen or flushed skin, headache, nausea, dizziness, weakness, exhaustion, heavy sweating.

First Aid: Heat exhaustion must be vigorously treated by having the victim lie down in a cool place, taking off as many clothes as possible, cooling the victim with a cool water spray, and encouraging the victim to drink cool fluids, preferably containing carbohydrates and electrolytes.

2.1.5 Heat Stroke

Heat stroke is an acute and dangerous condition caused by the failure of the body's heat regulating mechanisms. Heat stroke is a life-threatening condition.

Signs and Symptoms: Red, hot, dry skin, changes in the level of consciousness, vomiting. **This is a medical emergency! Call 911 immediately or follow the notification procedures specific to the facility/site you are at to obtain the assistance of emergency personnel. Some facilities/sites may have dedicated rescue services that can respond quicker than those that are dispatched by 911 (e.g. active military Bases). Refer to the SSHP for the preferred emergency response notification procedure.**

First Aid: Move worker to a cool, shaded place. Loosen tight clothing. Remove perspiration soaked clothing. Place the worker in a seated or supine position with legs raised. Apply cool, wet towels to the skin. Fan the person. If the person is conscious, give small amounts of cool water to drink (do not force person to drink). If the person

refuses water, vomits, or starts to lose consciousness, place the person on his or her side and continue to cool the person by applying ice or cold packs on their wrists, ankles, groin, neck, and in the armpits. Continue to check breathing and signs of life (coughing, slight body movement, or a pulse.)

2.2 MONITORING

Susceptibility to heat stress depends on numerous factors including ambient temperature, humidity, radiant heat, air movement, personal protective equipment, the degree of acclimatization, and physical condition of the individual workers. Therefore, the decision to start either environmental or physiological heat stress monitoring must be based on the experience and observations of the SSHO and on the professional judgment of the Corporate Environmental Safety and Health Manager (CESHM) and in consideration of the guidelines summarized below. However, on all job sites having potential heat stress conditions, the monitoring of site workers by watching for the signs and symptoms of heat stress must be ongoing by SSs, SSHOs, and the workers themselves.

2.2.1 Environmental Monitoring *(American Conference of Governmental Industrial Hygienist (ACGIH), Threshold Limit Values (TLVs), and Biological Exposure Indices (BEIs), most recent edition)*

If employees are performing moderate to heavy physical work on construction / remediation sites in standard permeable cotton or synthetic work clothing, heat stress monitoring is advisable when the ambient air temperature exceeds 90°F and any time discomfort due to heat stress is either noticed or reported. ***Either the WBGT index or physiological monitoring may be used. When WBGT exceeds 78°F, the work regiment in Table 2 of the ACGIH TLV/BEI booklet should be followed. Note: WBGT measurements are not designed for and should not be used to assess heat stress involving the use of semi permeable or impermeable protective clothing.***

As a general rule, PIKA institutes physiological monitoring in lieu of the WBGT index.

2.2.2 Physiological Monitoring *(National Institute for Occupational Safety and Health (NIOSH)/Occupational Safety and Health Administration (OSHA)/United States Coast Guard/U.S. Environmental Protection Agency, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities).*

Physiological monitoring can be used in lieu of or in addition to WBGT. The advantage of physiological monitoring is that it determines each individual's unique response to environmental heat stress factors. If employees are wearing impermeable protective clothing, physiological monitoring is advisable beginning at 70°F and/or any time discomfort due to heat stress is either noticed or reported.

Physiological monitoring may be performed by the SSHO. Alternatively, it may be self-performed if the affected employees have been trained to do so. The following two parameters are to be monitored at the beginning of each rest period:

Heart Rate

- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the beginning of the next rest period, shorten the following work cycle by one-third.

Temperature

- If temperature exceeds 99.6°F at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If temperature still exceeds 99.6°F at the beginning of the next rest period, shorten the following work cycle by one-third.
- Return to work is not permitted if body temperature exceeds 100.4°F.

NOTE: Some aural temperature devices, which are also known as ear canal or tympanic devices, will not work accurately in high intensity ambient light (Store and use in the shade).

Attachment 1, "Heat Stress Monitoring Record," will be used to record the results of heat stress monitoring

Note: Only after an individual has exceeded one of the physiological monitoring limits, within each work shift, will the prescribed modifications be initiated and continued to the end of that work shift. However, it is essential to the continued wellness of site personnel, to evaluate the effectiveness of the physiological controls. Therefore, the SSHO will notify the CESHM if any one of the below listed conditions occur:

1. A pattern of exceeding the physiological monitoring limits is established for one individual that indicates that the physiological monitoring limits are being exceeded at least once per day for more than three consecutive days.
2. A pattern of exceeding the physiological monitoring limits is established for a majority of the team that indicates that the physiological monitoring limits are being exceeded by over half the team members on a daily basis for more than three consecutive days.

2.3 PREVENTION

The prevention of heat-related illnesses requires adequate hydration, nutrition, acclimatization, access to shade if heat stress symptoms appear, monitoring, and in some cases the use of cooling devices.

2.3.1 Hydration

During periods of high heat, adequate liquids must be provided to replace lost body fluids. Most people do not become aware of thirst until they have lost 1 to 2 liters of body fluids. Highly motivated workers may incur losses of 3 to 4 liters before extreme thirst forces them to stop and drink. Therefore, workers must drink more than the amount required to satisfy thirst. Prehydration, the consuming of a large drink of water immediately before the start of heat exposure, is highly recommended.

In California, workers potentially exposed to heat stress in outdoor work sites are required to have ready and easy access to potable water or liquid sufficient to provide one quart per employee per hour (Title 8, California Code of Regulations, Section 3395, Heat Stress Prevention).

Replacement fluids can be a 0.1 percent salt water solution, commercial "sports drinks" or "thirst quenchers," or a combination of these with fresh water. However, drinks that are popular because they "cut" thirst are not recommended, because they inhibit intake before rehydration is complete. For this reason it is better to drink water or dilute flavored beverages and to avoid carbonation, caffeine, and drinks with heavy concentrations of sugar or salt.

The replacement fluid temperature should be kept cool, 50 degrees Fahrenheit (°F) to 60°F, and must be located within a few steps of each worker or brought to the worker every hour or more frequently under the most stressful conditions.

Alcohol is a common and serious problem among those who work in heat. Alcohol not only impairs intake of food and water, but also acts as a diuretic (increase in urination) and disturbs judgment. The adverse effects of alcohol extend many hours beyond the time of intake.

2.3.2 Nutrition

Workers in high heat areas should eat well balanced meals in order to replace salt and minerals lost in perspiration. High sweat rates involve a continuous loss of sodium chloride and small amounts of potassium, which must be replaced on a daily basis. In addition, work in heat accelerates the turnover of trace elements including magnesium and zinc. All of these essential elements should normally be obtained from wholesome food.

Do not consume salt tablets, as they are easily abused, and overdoses lead to gastro-intestinal problems, increased urine output, and greater susceptibility to heat illness. If salt and mineral loss is a problem, employees should consider lightly salting their regular meals and increasing fruit consumption to replace these losses.

2.3.3 Acclimatization

Acclimatization can greatly increase human tolerance to heat, so that work becomes less physically challenging after a period of gradual adjustment. Individuals with a high level of physical fitness generally display partial heat acclimatization and are able to complete the process more quickly and with less stress than sedentary persons. Season may also affect the time that must be allowed for acclimatization. Workers recruited in summer may already be partly heat acclimatized, while winter hires will require a longer period of adjustment.

Acclimatization for heavy work under extremely hot conditions may require a period of 4 to 10 days of progressively increasing work time starting with about 2 hours work per day. For less severe conditions, the first 2 to 3 days of work in the heat should be limited to 2 to 4 hours. Employees undergoing acclimatization need to be monitored closely for signs and symptoms of heat illness.

Maintenance of full heat acclimatization requires exposure to work in heat three to four times per week; lower frequency or passive exposure to heat have a much weaker effect and may allow gradual decay of heat tolerance. However, weekends off work have no measurable effect on acclimatization. Discontinuing heat exposure for 2 to 3 weeks will cause loss of most acclimatization, although some will be retained in persons exposed to hot weather and/or regular aerobic exercise.

2.3.4 Access to Shade

Employees suffering from heat illness or believing a recovery period is needed will be provided access to an area with shade that is either open to the air or provided with ventilation for cooling for a period of no less than 5 minutes. Access to shade will be permitted at all times. Employees will remove chemical protective garments during rest periods and will not be assigned other tasks during rest periods.

2.3.5 Cooling Devices

Vortex tubes or cooling vests may be worn beneath impermeable clothing. If cooling devices are worn, only physiological monitoring will be used to determine work activity.

2.4 HEAT STRESS TRAINING

Training is the key to good work practices. NIOSH (1986) states that a good heat stress training program should include the components listed below. Therefore, PIKA will provide personnel who work in hot environments with the training prescribed below:

1. Knowledge of the hazards of heat stress.
2. Recognition of predisposing factors, danger signs, and symptoms.
3. Awareness of first-aid procedures for, and the potential health effects of, heat stroke.
4. Employee responsibilities in avoiding heat stress.

5. Dangers of using drugs, including therapeutic ones, and alcohol in hot work environments.
6. Use of protective clothing and equipment.
7. Purpose and coverage of environmental and medical surveillance programs.

2.4.1 Supervisor Training Requirements

SSs shall receive specific training in protocols to prevent heat related illness, and recognizing signs and symptoms of different stages of heat related illness. Training shall also include company guidelines for initial treatment of suspected heat related illness which will include emergency response procedures as set forth within the APP/SSHP.

2.5 HEAT STRESS DOCUMENTATION

The SSHO shall be responsible for the proper documentation of heat stress related information. Training sessions shall be documented using the PIKA Documentation of Training Form-503. Pulse rate and temperature monitoring data will be recorded on the Heat Stress Monitoring Log Form-527, with the environmental conditions, WBGT (if used) being recorded in the Site Safety Log.

3.0 REFERENCES

There are no OSHA standards that directly apply to the conduct of operations associated with this SOP. However the references listed below contain relevant data regarding heat stress prevention.

- ACGIH, TLVs and BEIs.
- NIOSH Occupational Safety and Health Guidance for Hazardous Waste Site Activities, U.S. Department of Health and Human Services.

4.0 ATTACHMENTS

Attachment 1: "Heat Stress Monitoring Log".

Project/Location: _______________ **SSHO:** _______________________ **Date:** ____________

Employee Name	Initial Reading	First Work Period		Second Work Period		Third Work Period		Fourth Work Period		Fifth Work Period		Sixth Work Period	
	Time	Time		Time		Time		Time		Time		Time	
	Air Temp.	Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)	
	Initial Temp.	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial H.R.	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial Temp	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial H.R.	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial Temp	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial H.R.	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial Temp	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	Initial H.R.	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final

1.0 PURPOSE

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

2.0 PROCEDURES

2.1 COLD STRESS HAZARDS

In cold environments, overexposure can cause significant stress on the body that can lead to serious and potentially permanent injury. Cold may affect exposed body surfaces and extremities, or may affect the deeper body tissues and body core. Presented below is information about the most common cold stress disorders, their signs, symptoms, affects and control techniques.

2.1.1 Cold Stress Disorders

2.1.1.1 Immersion Foot or Trench Foot

These two cold injuries occur as a result of exposure to cool or cold weather and persistent dampness or immersion in water. Immersion foot usually results from prolonged exposure when air temperatures are above freezing, whereas trench foot normally occurs from shorter exposure at temperatures near freezing. The symptoms for each disorder are similar and include tingling, itching, swelling, pain and/or numbness, lack of sweating, and blisters.

2.1.1.2 Frostbite

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

2.1.1.3 Hypothermia

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

2.1.2 Treatment of Cold Stress Disorders

The intent of cold stress treatment is to bring the deep body core temperature back to its normal temperature of about 98.6ºF. Workers exhibiting cold stress symptoms should be brought to a warm area and allowed to rest and warm-up. If a worker's clothing becomes wet it reduces its insulation affect. It should be removed and replaced by dry clothing, or allowed to dry before resuming work. Warm, sweet, non-alcohol, decaffeinated drinks (not coffee) or soup should be given to increase the body core temperature, and re-warming should be gradual.

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

2.1.3 Prevention of Cold Stress Disorders

2.1.3.1 Cold Stress Monitoring

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

1. A suitable thermometer for measuring ambient temperatures shall be available on sites when the air temperature is below 60.8ºF;

2. Whenever the air temperature onsite falls below 30.2ºF, the temperature shall be measured and recorded at least once every two hours, unless sudden drops in the temperature are expected or noted, then it will be recorded once each hour;
3. Whenever the air temperature on site falls below 30.2ºF, the wind speed shall be measured and recorded together with the air temperature;
4. The equivalent wind chill temperature shall be obtained from Table 507-1, and recorded, in cases when air speed measurements are required;
5. The Site Safety and Health Officer (SSHO) shall utilize the applicable TLV limits listed in Table 507-2 to determine if elevated control measures must be implemented during site activities.

2.1.3.2 Controls to be Implemented by Site Personnel

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

1. Use layered clothing which should include, an innermost layer (such as cotton or silk) to trap heat and absorb perspiration, an insulating layer of wool or synthetic fiberfill (such as polypropylene), a layer of work weight clothing, and an outer protective layer designed to retain heat and be wind/water proof (such as nylon, or Gortex®);
2. Wear gloves, socks and a hat that are synthetic or wool insulated;
3. Remove outer layers of clothing during breaks in heated shelters to prevent inner layers from getting wet with perspiration;
4. Cover exposed skin and use a wind breaker in windy, cold conditions;
5. Eat well-balanced meals and maintain adequate intake of non-alcohol, de-caffeinated fluids;
6. Seek shelter in a warm protected area when signs and symptoms of cold stress become evident;
7. Protect clothing from getting wet with perspiration during site activities by monitoring and moderating the level of physical activity, and if necessary, removing excessive layers of clothing; and
8. If the potential exists for clothing to become wet during site operations, site personnel should report to work with an extra set of work and insulated clothing.

TABLE 507-1: EQUIVALENT CHILL TEMPERATURE

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

TABLE 507-2: ACGIH COLD STRESS TLVS

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

ECT - Equivalent Chill Temperature
Air - Ambient air temperature

2.1.3.3 Controls to be Implemented On-site

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

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

When permitted by site conditions and contamination levels, personnel utilizing shelters inside the EZ will undergo an abbreviated decontamination prior to entry. Upon leaving the warming shelter, EZ personnel will re-don chemical resistant inner and outer gloves, IAW the PPE donning procedures listed in the SSHP. The abbreviated decontamination will include:

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

2.1.3.4 Additional Work/Rest Cycles

To date, there is no Federal or U.S. Army Corps of Engineers (USACE) mandated regulations related to work/rest schedules for cold stress. The work/rest cycle outlined in this SOP is a recommended routine, but may not be adequate for the actual cold weather conditions that may be encountered. The ACGIH has published a work/rest schedule, which is provided in Table 507-3 of this SOP. However, this table only applies to, and should be implemented for, temperatures below –4ºF. Therefore, for temperatures above –4ºF, workers shall be encouraged to utilize the work rest schedule listed above or to seek shelter in a warm area, especially if they exhibit cold stress symptoms such as heavy shivering, frost-nip, the feeling of excessive fatigue, drowsiness, irritability or euphoria.

TABLE 507-3: TLV WORK/REST SCHEDULE FOR 4-HOUR WORK SHIFT *

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

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up cycle in a warm location and with an extended break in a warm location (e.g. lunch) at the end of the 4-hours. For light-to-moderate work: apply the schedule one step lower.
2. The following is suggested as a guide for estimating wind velocity if other, more accurate means are not available: 5 mph - light flag moves; 10 mph - light flag fully extended; 15 mph - raises newspaper sheet; 20 mph - blowing and drifting snow.
3. This table applies only to acclimatized workers with appropriate dry clothing for winter work.
4. Adapted from the TLVs and Biological Exposure Indices (BEIs), ACGIH, Cincinnati, OH.

2.1.4 Cold Stress Documentation

The SSHO shall be responsible for recording cold stress related information. Training sessions shall be documented using the PIKA Training Log Form-503. Environmental conditions and monitoring data will be recorded in the Safety Log, and/or Site Monitoring Log Form-533.

3.0 REFERENCES

There are no Occupational Safety and Health Administration (OSHA) standards that directly apply to the conduct of operations associated with this SOP. However the references listed below contain relevant data regarding cold stress prevention.

- ACGIH TLVs and BEIs
- USACE EM 385-1-1, Section 06.I.

4.0 ATTACHMENTS

No attachments associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures for controlling employee exposure to bloodborne pathogens. This SOP will be used in conjunction with the PIKA Environmental Corporate Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel, and operations where personnel may be exposed to bloodborne hazards. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

- OSHA General Industry Standard 29 CFR Part 1910.1030.
- USACE EM 385-1-1, Section 03, Medical and First Aid Requirements.

4.0 DEFINITIONS

Blood - means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens (BBP) - means pathogenic microorganisms that are present in human blood and can cause disease in humans. Examples of theses pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated - means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on the surface of an item.

Contaminated Clothing - clothing, whether personal or company provided, which has been soiled with blood or other potentially infectious materials.

Contaminated Sharps - any object which is contaminated with blood or other potentially infectious materials that can penetrate the skin including, needles, tweezers, broken glass, etc.

Decontamination - the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens from the surface of an item to the point where the surface of the item is rendered safe for handling, use, or disposal.

Exposure Incident - a specific incident that results from the performance of an employee's occupational responsibilities that involves eye, mouth, other mucous

membrane, broken skin, or parenteral contact with blood or other potentially infectious materials.

Hand Washing Facilities – a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

Licensed Healthcare Professional - is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by this program for Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV - hepatitis B virus responsible for causing Hepatitis.

HIV - human immunodeficiency virus responsible for Auto Immunodeficiency Syndrome (AIDS).

Occupational Exposure - reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Potentially Infectious Materials - any body fluid that is visibly contaminated with blood, and body fluids in situations where it is difficult or impossible to differentiate between body fluids.

Parenteral - means piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions.

Personal Protective Equipment (PPE) - specialized clothing or equipment worn by an employee for protection against a hazard. PPE applicable to this program shall be considered appropriate only if it does not permit blood or other infectious fluids to reach employee's clothing, skin, eyes, mouth, or other mucous membranes under normal working conditions.

Regulated Waste - means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Source Individual - means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.

Sterilize - means the use of a physical or chemical procedure to destroy microbial life including highly resistant bacterial endospores.

Universal Precautions - means an approach to infection control, in which human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls - means controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

5.0 RESPONSIBILITIES

5.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the adequate first aid and BBP supplies equipment. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

5.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) shall be responsible for the implementation of the Bloodborne Pathogen Exposure Control Program contained in the PIKA Corporate Environmental Safety and Health Program, and for monitoring the implementation of this SOP. To this effect, the CESHM is responsible for the following:

1. Conducting a review of PIKA job classifications to determine which will have a reasonably anticipated potential for an occupational exposure and completing the exposure determination forms;
2. Verifying during site audits that Universal Precautions are implemented and appropriate PPE is available for job classifications involving occupational exposure;
3. Developing procedures for the decontamination of items or surfaces contaminated with blood or infectious body fluids;
4. Providing guidance to project personnel related to the proper labeling, and disposition of regulated waste in accordance with applicable Federal, state and local regulations;
5. Making the Hepatitis B vaccination available to occupationally exposed employees at no cost to the employee;
6. Completing Parts II and III of the Post BBP Exposure Evaluation and Follow-up Form (Form-520) after an exposure incident and ensuring the health care professional receives pertinent information for the post exposure evaluation;
7. Providing training to occupationally exposed workers;
8. Working with the PIKA Human Resource personnel to maintain medical and training records as required by this and other SOPs; and
9. Performing an annual review of the Exposure Control Plan.

5.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP and for the adequate provision of BBP protection kits to minimize the risk of first aid personnel contacting blood or other BBP hazards. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel involved with providing first aid to injured personnel are fully trained in Universal BBP controls and are qualified as outlined in this SOP.

5.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.6 EMPLOYEE RESPONSIBILITIES

Employees whose job classification involves the potential for occupational exposures to blood or other infectious materials will have the following responsibilities:

1. Becomes knowledgeable and complies with this Bloodborne Pathogen SOP;
2. Properly uses required PPE and other methods of control when performing a task which potentially exposes the employee to blood or other potentially infectious materials;
3. Complies with hygiene practices required when working with blood or other potentially infectious materials;
4. Follows proper housekeeping practices;
5. Decontaminates or disposes of PPE, clothing, and/or contaminated equipment properly, and
6. Notifies supervisor immediately when an exposure incident occurs.

6.0 UNIVERSAL PRECAUTIONS

The strategy of "Universal Precautions" was developed by the Center for Disease Control to address concerns regarding transmission of HIV. The concept of universal controls stresses that sources should be assumed to be infectious for blood-borne pathogens. The philosophy of universal precautions shall be applied whenever PIKA employees render first aid involving potential contact with blood or other potential infectious materials.

7.0 EXPOSURE DETERMINATION

Exposure determinations will be performed by the CESHM to identify job classifications in which all and/or some of the employees under that job classification have the potential for occupational exposures. The results of the exposure determination will be documented using the BBP Post-Exposure and Follow-up form (Form-520).

8.0 SAFE WORK PRACTICES AND PPE

8.1 SAFE WORK PRACTICES

Safe work practices will be implemented whenever possible to eliminate or reduce the potential for employee exposure, and will include, but are not limited to:

- Hand washing facilities will be readily accessible to employees.
- Employees shall wash their hands immediately or as soon as feasible after removal of gloves or other PPE.
- Employees shall wash hands and any other skin with soap and water, or flush mucous membranes with water immediately following contact with blood or potentially infectious materials.
- If potentially contaminated sharps are encountered, the item shall immediately be disposed of in an appropriate container or decontaminated.
- Eating, drinking, smoking, applying of cosmetics or lip balm, handling of contact lenses or storage/handling of food is prohibited in areas where potentially infectious materials are present.
- Potentially contaminated clothing will be handled IAW Section 9.0 of this program.
- Equipment that has become contaminated will be decontaminated prior to servicing or storage, unless decontamination is not feasible, in which case the equipment will be disposed of properly.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

When occupational exposures remain after the implementation of engineering and work practice controls, appropriate PPE will be utilized in accordance with the following to control employee exposures.

- Appropriate PPE will be provided to employees exposed to infectious materials at no cost to the employee. Appropriate PPE includes, but is not limited to, gloves, gowns, face shields, masks, and goggles.
- PPE is considered "appropriate" if it does not permit infectious materials to reach the employee's personal or work clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use, for the expected duration of time for which the PPE will be used.
- All PPE will be repaired, or replaced as needed, to maintain its effectiveness.
- When PPE is removed it will be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

- Masks in combination with eye protection devices, such as safety glasses, goggles or face shields, will be worn whenever blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.
- Gloves will be worn when it can be reasonably anticipated that the employee may have hand contact with potentially infectious materials.
- Disposable (single use) gloves will not be washed for reuse and will be disposed of after each use or if their ability to function as a barrier is compromise.

9.0 HOUSEKEEPING

The work site will be maintained in a clean and sanitary condition to prevent the spread of contamination to other areas of the facility. Equipment and working surfaces will be cleaned and decontaminated after contact with blood or other potentially infectious materials. Contaminated work surfaces and equipment shall be decontaminated with an appropriate disinfectant immediately after they become contaminated.

9.1 REGULATED WASTE

All regulated waste will be disposed of in accordance with applicable Federal, state and local regulations. Regulated waste, other than contaminated sharps, shall be placed in containers which are:

1. Closable;
2. Constructed to contain contents and prevent leakage;
3. Properly labeled or color-coded; and
4. Closed prior to removal or replacement.

Regulated waste containing contaminated sharps will be placed in containers which are:

1. Closable;
2. Puncture resistant and leak proof on sides and bottom;
3. Properly labeled or color-coded; and
4. Closed prior to removal or replacement.

10.0 CLOTHING

Potentially contaminated clothing should be removed and bagged at the location where it is used. Potentially contaminated clothing should be handled as little as possible to prevent contamination of the air and of persons handling the clothing. Potentially contaminated clothing should also be placed in bags that prevent leakage and are properly labeled or color-coded.

Additionally, potentially contaminated company-provided clothing should be washed with detergent in water at least 71°C (160°F) for 25 minutes. If low-temperature (<70°C[158°F]) laundry cycles are used, chemicals suitable for low-temperature washing, at proper use concentrations, should be used.

11.0 HEPATITIS B VACCINATIONS

All workers whose jobs involve participation in tasks or activities with exposure to blood or other body fluids, to which Universal Precautions apply, will be encouraged to receive a hepatitis B vaccine. Medical evaluations and procedures including the hepatitis B vaccinations will be performed by a licensed healthcare professional, and provided to the employee at no cost to the employee. Vaccinations will be offered within 10 working days of initial assignment and at a later date upon request if employee initially declines the vaccine, and as recommended by the U.S. Public Health Services for future booster doses. Anyone refusing the hepatitis B vaccine must sign a Hepatitis B Vaccine Declination Form-521. A copy of 29 CFR 1910.1030 "Bloodborne Pathogens" will be provided to the Healthcare Professional responsible for the hepatitis B vaccination. Documentation of each occupationally exposed employee's hepatitis B vaccination status shall be maintained in their medical file.

12.0 POST-EXPOSURE EVALUATION AND FOLLOW-UP

12.1 GENERAL REQUIREMENTS

Following an exposure incident, a confidential medical evaluation and follow-up will immediately be made available to the employee involved. The following elements will be covered and documented on the Post BBP Exposure Evaluation and Follow-Up Form-520.

1. Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred;
2. Identification and documentation of the source individual, unless establishing that identification is infeasible or prohibited by state or local law;
3. When possible the source individual's blood will be tested as soon as feasible, after consent is obtained, in order to determine HBV and HIV infectivity. If consent is not obtained, it will be documented that legally required consent could not be obtained. When the source individual's consent is not required by law, the source individual's blood, if available will be tested and the results documented;
4. When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status will not be repeated; and
5. Results of the source individual's testing will be made available to the exposed employee, and the employee will be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

12.2 HEPATITIS B VIRUS POST-EXPOSURE MANAGEMENT

When exposure from a source individual is found to be positive, the worker who has not previously been given a hepatitis B vaccine will be offered the vaccine series, or a single

dose of hepatitis B immune globulin (HBIG), if the vaccine cannot be given within seven days of exposure.

Workers who have previously received HBV vaccination and receive an exposure from a positive source should be tested for antibody to hepatitis B, and given one dose of vaccine and one dose of HBIG if the antibody level in the worker's blood sample is inadequate. If the source individual is negative and the worker has not been vaccinated, this opportunity should be taken to provide hepatitis B vaccination. If the source individual refuses testing or he/she cannot be identified, the exposed worker should receive treatment as if the source was determined to be positive.

12.3 HIV POST-EXPOSURE MANAGEMENT

For any exposure to a source individual who is found to be positive for HIV infection the exposed worker should be counseled regarding the risk of infection and evaluated clinically and serologically for evidence of HIV infection as soon as possible after the exposure. If the exposed employee consents to a baseline blood collection but does not consent at that time to HIV testing, the sample will be preserved for 90 days. Exposed workers who tested seronegative initially should be retested at 6 weeks, 12 weeks, and 6 months after exposure to determine whether transmission has occurred.

If the source individual was tested and found to be seronegative for HIV, the source should be questioned to determine their participation in any activities that would cause a High Risk Factor for infection of HIV. If source has a High Risk Factor, treatment should be as if the source was found to be seropositive. If source has a Low Risk Factor, no follow-up required but HIV testing will be made available if requested by the exposed employee or the health-care provider. If the source individual refuses testing or he/she cannot be identified, the exposed worker should receive treatment as if the source was determined to be positive.

12.4 MEDICAL OPINION DOCUMENTATION

A written opinion of the Health Care Professional shall be obtained and placed in the medical file of the exposed employee with a copy of the written opinion being provided to the exposed employee within 15 days of the completion of the evaluation.

13.0 COMMUNICATION OF HAZARDS TO EMPLOYEES

13.1 LABELING

A fluorescent orange or orange-red label with lettering or symbol in a contrasting color shall identify containers of regulated waste. Red bags or red containers may be used as a substitute for labels.

13.2 TRAINING

All employees with occupational exposure to blood or other potentially infectious materials shall receive training as follows:

1. When initially assigned to a task where occupational exposure may occur; and
2. Annually thereafter.

Additional training will be provided when changes in tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created. The training program will contain the following elements:

1. An accessible copy of the regulatory text of this standard and an explanation of its contents;
2. A general explanation of the epidemiology and symptoms of bloodborne diseases;
3. An explanation of the modes of transmission of bloodborne pathogens;
4. An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;
5. An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
6. An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and PPE;
7. Information on the types, proper use, location, removal, handling, decontamination, and disposal of PPE;
8. An explanation of the basis for selection of PPE;
9. Information on the hepatitis B vaccine, including its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
10. Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
11. An explanation of the procedure to follow if an exposure incident occurs;
12. Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
13. An explanation of the signs and labels and/or color coding required for regulated materials containers; and
14. An opportunity for interactive questions and answers with the person conducting the training session.

14.0 RECORDKEEPING

14.1 MEDICAL

PIKA or its designated representative will maintain medical records for each employee with an occupational exposure for a period of 30 years beyond termination of employment. These records will include:

1. The name and social security number of the employee;
2. A copy of the employee's hepatitis B vaccination status including the dates of the hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination;
3. A copy of results of examinations, medical testing, and follow-up procedures;
4. The employer's copy of the healthcare professional's written opinion; and
5. A copy of the information provided to the healthcare professional.

Employee medical records will be:

1. Kept confidential; and
2. Not be disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

14.2 TRAINING RECORDS

Training records will be maintained for three years from the date in which training occurred, and will include:

1. The dates of the training sessions;
2. The contents or a summary of the training sessions;
3. The names and qualifications of persons conducting the training; and
4. The names and job titles of persons attending the training sessions.

15.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of products containing hazardous substances. This SOP will be used in conjunction with the PIKA Environmental Corporate Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

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

3.0 REGULATORY REFERENCES

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

- OSHA Construction Industry Standard 29 CFR Part 1926.59; and
- OSHA General Industry Standard 29 CFR Part 1910.1200.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the equipment that personnel will need to safely work with products containing hazardous substances. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.

2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to hazard identification and the protective measures applicable to this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve personnel exposure hazardous substances required to perform site operations. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel involved with use of products containing hazardous substances are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

4.5 SITE PERSONNEL

All PIKA site personnel will be responsible for implementing this SOP during any assigned tasks that require the use of products containing hazardous substances. While PIKA has the responsibility of providing the necessary information, documentation and resources for implementation of this SOP, site personnel have a responsibility to integrate the requirements of this SOP into their daily operations involving hazardous substances.

5.0 PROCEDURE

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

5.1 MATERIAL SAFETY DATA SHEET (MSDS)

5.1.1 MSDS Availability

An MSDS for each product containing a hazardous chemical, to which employees are or may be exposed, will be obtained and made readily available to site employees. MSDSs will be located at each project site. The SSHO will be responsible for obtaining and maintaining MSDSs. The SSHO will also be responsible for reviewing MSDSs for significant safety and health information, which will then be passed on to the affected employees during formal training sessions. MSDSs will also be reviewed by the SSHO for completeness. If an MSDS is missing or considered to be incomplete or insufficient, a new MSDS will be requested from the manufacturer.

MSDSs will be available for employees in their work area for review. If an MSDS is not available or a new chemical being used on site does not have a corresponding MSDS, the SSHO will obtain the MSDS from the manufacturer as soon as possible. An MSDS that does not specifically identify the hazardous chemicals contained in the project will be accepted if:

1. The information has been classified as a trade secret; and
2. The MSDS contains adequate information related to the physical and health hazards associated with the product.

5.2 CHEMICAL INVENTORY

A Site Specific Chemical Inventory will be maintained by the SSHO. This inventory will include products containing hazardous chemicals. The Chemical Inventory Report Form-528 will be used to maintain the site-specific chemical inventory.

5.3 LABELING

5.3.1 Container Labeling

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

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

5.3.2 Secondary Container Labeling

Secondary containers will be properly labeled with an appropriate hazard communication label provide personnel with information concerning chemicals in their

work areas. This label must communicate the identity of the hazardous chemicals contained in the product and their appropriate physical and health hazard warnings.

5.4 EMPLOYEE INFORMATION AND TRAINING

5.4.1 General

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

5.4.2 Required Information

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

1. The basic requirements of the OSHA Hazard Communication Standard, including employee rights under the regulation;
2. Operations/processes where the potential exists for exposure to hazardous chemicals;
3. Location of the written Hazard Communication (HAZCOM) Program, the Chemical Inventory and the MSDSs;
4. How chemicals may be detected/monitored (instrumentation, color, odor, state);
5. Physical hazards (i.e., flammability, reactivity);
6. Chemical hazards, including the effects a chemical has on the body (long and short term) through inhalation, ingestion or skin contact;
7. How workers can protect themselves from overexposure or emergency situations (engineering controls, work practices, PPE and emergency procedures);
8. Steps that have been taken to lessen or prevent exposure to hazardous chemicals through implementation of the HAZCOM Program;
9. Spill response procedures for chemical emergencies;
10. Emergency and first aid procedures to follow if employees are over exposed to any hazardous chemicals; and
11. How to read labels and review MSDSs to obtain appropriate hazard information.

5.4.3 Documentation of Training

Hazardous Communication Training will be documented by the SSHO using the Documentation of Hazard Communication Training Form-505.

5.5 HAZARDS FROM NON-ROUTINE TASKS

Periodically, employees are required to perform potentially hazardous, non-routine tasks that may involve chemical or physical hazards. Prior to starting work on such tasks, the SSHO will give the affected employees information about the hazards to which they may be exposed. This training will be documented in the PIKA Site Training Log Form-502, and will include:

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

5.6 INFORMING CLIENTS/SUBCONTRACTORS

Each client/subcontractor will be instructed to inform the SSHO of any hazardous chemicals which they bring on site and will provide a copy of the MSDS for each specific chemical(s). Outside clients/subcontractors will be provided by the SSHO with the following information to allow them to work safely on site:

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

5.7 INDUSTRIAL HYGIENE SURVEY

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

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

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

5.8 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

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

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

6.0 AUDIT CRITERIA

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

- The Daily Task and Safety Briefing Log (Form-502);
- The Chemical Inventory Report Form (Form-528);
- The Documentation of Hazard Communication Training Form (Form-505); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of hazard warning signs, tags, or labels. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel, and operations involving the need to post site hazards with signs, tags or labels. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

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

- OSHA Construction Industry Standard 29 CFR Part 1926.200;
- OSHA General Industry Standard 29 CFR Part 1910.145; and
- USACE EM 385-1-1, Section 8.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store, maintain and use appropriate signs and labels for hazard identification and notification. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to hazard identification and the protective measures applicable to this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that the use of signs and labels for hazard notification. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel working in areas where signs and labels are used for hazard identification and recognition are trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

5.1.1 General Requirements

An important element of site safety involves providing site personnel with information related to hazardous operations, areas and materials. To allow for effective, consistent communication of these hazards, the following areas and hazards shall be posted with appropriate signs or labels:

1. All site control zones where specific training, medical surveillance or personal protective equipment (PPE) is required for entry will be posted to restrict

unauthorized or unqualified personnel from entering the area;
2. All areas where operations are conducted which create the potential for personnel exposure to chemical or physical hazards (i.e., noise, respiratory hazards, etc.) will be posted with signs indicating the type of hazard and the PPE to be worn in the area;
3. Signs, labels, or tags shall be visible at all times when the hazard or problem exists, and shall be removed or covered when the hazard or problem no longer exists;
4. In the event that radio frequencies present a hazard to personnel, appropriately colored and configured signs will be posted;
5. Containers of hazardous materials, which do not have adequate warning labels, will be labeled IAW the PIKA SOP-509 Hazard Communication requirements;
6. All site personnel shall be informed as to the meaning of the various signs, tags and labels used throughout the site;
7. The location of first aid and fire protection equipment will be conspicuously posted; and
8. Signs, tags or labels will be used and conspicuously displayed when lock out/tag out procedures are used for the isolation of hazardous or stored energy.

5.1.2 Color Schemes

For signs, labels and tags (except piping systems) the following color scheme will apply:

1. Red - Designates dangerous conditions, emergency stop controls, fire detection and suppression equipment and containers of flammable liquids;
2. Orange - Designates dangerous parts of machinery or energized equipment;
3. Yellow - Designates conditions requiring caution, marking dangerous chemicals, marking physical hazards, and markings for ionizing radiation;
4. Green - Designates safety equipment and operator devices, and location of first aid and safety equipment (other than firefighting equipment); and
5. Blue - Designates information of a non-safety nature.

5.1.3 Selection of Sign, Labels and Tags

In addition to the requirements listed above, the following guidelines will be incorporated in the selection and display of signs, labels and tags:

1. Danger signs shall have the word "DANGER" in white on a black oval background and shall indicate a specific immediate danger, capable of causing irreversible damage or injury and indicates that specific precautions be taken to avoid the danger;
2. Caution signs shall have the word "CAUTION" in yellow on a black background and shall be used to call attention to a specific potential hazards, capable of causing severe but reversible damage or injury, against which proper precautions

should be taken;

3. General safety signs shall have key words in white on a green background and shall indicate notices of general practice and rules related to health, first aid, medical equipment, sanitation, housekeeping and general safety; and
4. General information signs shall have the word "NOTICE" in white on a blue background and shall provide general information required to avoid confusion or misunderstanding.

5.2 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel will wear appropriate PPE when posting signs to protect them from hazards associated with any tools used to post the signs.

6.0 AUDIT CRITERIA

The following items related to the posting of signs, labels and tags will be audited to determine compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

No attachments associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures required to provide for adequate fire prevention and protection. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including contractor and subcontractor personnel and operations conducted where fire prevention measures and fire protection precautions are needed for the safety and health of site personnel. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

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

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the requisite fire prevention and protection equipment needed for safe site operations. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to hazard identification and the protective measures applicable to this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve personnel exposure to fire hazards and involve fire prevention procedures. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel involved with fire prevention and protection are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURES

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

5.1 CAUSES OF FIRES AND EXPLOSIONS

Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the conduct of site activities, such as moving drums,

mixing/bulking of site chemicals and during refueling of heavy or hand held equipment. Some potential causes of explosions and fires include:

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

5.2 FIRE PREVENTION

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel onsite and members of the general public. Site personnel conducting operations involving flammable or combustible material shall follow the guidelines listed below to aid in the prevention of fires and explosions.

5.3 SITE INSPECTIONS

The SSHO will inspect the site daily to determine if flammable and combustible materials are being safely stored in appropriate containers in properly configured and segregated storage areas. The SSHO will also provide consultation and guidance to personnel in charge of potential sources of ignition so that they are maintained a safe distance from storage areas.

5.4 IGNITION SOURCES

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

5.4.1 Storage of Flammable and Combustible Materials

5.4.1.1 Approved Containers

Quantities of flammable liquids greater than one gallon, shall be stored or handled in OSHA approved safety cans only. These cans have a built-in flame arrestor and a tight-

fitting self-closing lid to reduce the possibility of vapors escaping from the can. For quantities of flammable liquids of one gallon or less, the original container or an OSHA approved safety can shall be used for handling or storage.

5.4.1.2 General Storage Requirements

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

1. Flammable materials shall be stored in a segregated area located away from spark or ignition sources, with flagging, or other barrier materials, erected at a radius of fifty feet from the storage area, and "NO SMOKING MATCHES OR OPEN FLAME signs posted at the fifty foot barrier line;
2. If, due to site configuration, a fifty foot radius barrier cannot be erected around the storage area, signs stating "NO SMOKING MATCHES OR OPEN FLAME WITHIN 50 FEET" will be posted at the storage location;
3. For storage inside a building, no more than 25 gallons of flammable materials may be stored outside of approved fire cabinet, and no more than 60 gallons of flammable or 120 gallons of combustible liquids may be stored in each cabinet;
4. For storage of containers (of not more than 60 gallons each) outside, no more than 1,100 gallons shall be stored in one designated area, with at least five feet separating storage areas;
5. Outdoor storage areas shall be at least 20 feet from the nearest building, and there shall be a 12 foot wide fire truck access lane within 200 feet of the storage area;
6. Storage areas outside shall be graded to allow collection of spilled material or provided with a 12 inch curbed or earthen dike containment system of sufficient volume to contain the contents stored in the area, and provisions shall be made for drainage or collection of accumulated rain water or spilled materials;
7. Metal drums used for storing flammable/combustible liquids shall be equipped with self-closing safety faucets, vent bung fittings, grounding cables and drip pans, and shall be stored outside buildings in an area approved by the SSHO;
8. The storage area shall be kept free of weeds, debris and other combustible materials not related to the storage; and
9. At least one fire extinguisher rated 40B:C units or greater shall be located between 25 and 75 feet of outdoor storage areas.

5.4.2 Dispensing Flammable and Combustible Liquids

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

1. Areas where flammable or combustible liquids are dispensed in quantities greater than five gallons shall be separated from other operations must be at least 25 feet;

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

5.4.3 Handling Liquids at Point of Final Use

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

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

5.4.4 Service and Refueling Areas

The following requirements shall apply to service and refueling areas:

1. Only approved storage containers, trucks and hoses shall be used;
2. No smoking will be allowed within 50 feet of areas where fueling operations are being conducted, and conspicuous signs shall be posted prohibiting smoking in the area;
3. The motors of equipment being fueled shall be shut off during fueling; and
4. A fire extinguisher of at least 40B:C units or greater shall be located within 75 feet of fueling operations.

5.4.5 Handling and Dispensing

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

5.5 FIRE PROTECTION

5.5.1 General Requirements

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

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

5.5.2 Training

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

5.5.3 Fire Extinguishers

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

5.6 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment (PPE) shall be used in preventing or reducing exposures associated with fire prevention and protection operations. These requirements will be implemented unless superseded by site-specific requirements stated in the Site Safety and Health Plan.

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

6.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Safety Training Attendance Log (Form-503);
- The Daily Inspection and Weekly Audit Report Form (Form-506); and

- The fire extinguisher inspection cards.

7.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to site sanitation, housekeeping and illumination practices. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including contractor and subcontractor personnel, and operations involved in PIKA projects. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

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

1. Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926;
2. OSHA General Industry Standards 29 CFR Part 1910.120 and 141;
3. USACE EM 385-1-1, Section 2.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to meet the sanitation, housekeeping and illumination requirements of this SOP. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CSHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CSHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.

3. Providing the Site Safety and Health Officer (SSHO) with consultation related to hazard identification and the protective measures applicable to this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve sanitation, housekeeping and illumination issues. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

5.1 SAFETY HAZARDS AND OPERATIONAL CONTROL TECHNIQUES

All personnel, including subcontractor personnel, shall be familiar with the work practices and control techniques listed in this SOP which will be used to provide proper on-site sanitation, housekeeping and illumination.

5.1.1 Potable Water Supply

An adequate supply of potable (drinkable) water shall be provided onsite at all times, and shall be supplied IAW the following provisions:

1. Containers used for potable water shall be capable of being tightly closed, equipped with a tap and maintained in a clean sanitary condition;
2. A container used for distribution of drinking water shall be clearly labeled as to its contents and not used for any other purpose;
3. Water shall not be dipped from the container and use of a common cup shall not be allowed; and
4. Where single service cups are provided, separate sanitary containers shall be provided for the storage of the unused cups and for the disposal of the used cups.

5.1.2 Nonpotable Water

Outlets and storage containers for nonpotable water, such as water for firefighting or decontamination shall be clearly labeled to indicate that the water is not suitable for drinking, washing or cooking. At no time shall there be a cross connection or open potential between a system furnishing potable water and a system furnishing nonpotable water.

5.1.3 Toilet Facilities

Temporary toilet facilities shall be located at the site, in the support zone (SZ). Chemical, re-circulating, combustion or flush toilets may be used to fulfill this requirement. Each temporary toilet shall be in good repair, naturally lighted, ventilated, with tight fitting doors, lockable from the inside, and shall be serviced at least weekly. The minimum requirements for toilet facilities can be found in the OSHA standard 29 CFR 1910.120(n). However, to provide for sanitary and adequate facilities, portable toilet facilities will be provided based on one toilet for every ten to fifteen workers assigned to the site.

5.1.4 Washing Facilities

Hand and face washing facilities shall be set up in the SZ, and shall be utilized by personnel exiting the work zone. As a minimum, disposable handy wipes/baby wipes, and trash receptacles will be made available to allow site personnel to wash exposed skin surfaces after exiting the work zone.

5.1.5 Site Housekeeping

All work areas shall be maintained in a clean/neat fashion, free of loose debris and scrap. Any materials/equipment not being used shall be removed from the work area and stored or disposed of accordingly. Work areas shall be supplied with a waste receptacle with a tight fitting lid, the contents of which shall be emptied in such a manner as to avoid creating unsanitary conditions. Break rooms and other areas where food is served or consumed shall be supplied with a waste receptacle with a tight fitting lid, which shall be maintained in a sanitary conditions with the contents emptied on a daily basis. To allow for the daily maintenance and inspection of the machinery and heavy equipment on site, a self-closing flammable/combustible waste can for oil/solvent soaked rags shall be maintained in areas where maintenance operations occur.

5.2 ILLUMINATION

As a rule, site personnel will not be permitted to work during the period between 30 minutes before sundown to 30 minutes after sunrise. To determine that site personnel have the minimum level of lighting needed, or if site operations must be conducted at night, illumination levels in Table 512-1 shall the minimum allowed during the conduct of site related activities.

Table 512-1, Minimum Illumination Levels

Foot-candles	Area of Operation
5	General site area, and inside facilities, such as warehouses, hallways, and exit ways.
3	Excavation and waste areas, field maintenance, active storage and fueling areas.
10	General shops, storerooms, dressing and eating areas, maintenance areas.
30	First aid stations, infirmaries and offices.

5.3 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing hazards associated with improper sanitation, illumination and housekeeping. These requirements will be implemented unless superseded by site-specific requirements stated in the site plans.

1. Personnel disposing of medical/biological wastes will, as a minimum, use rubber gloves, and any other PPE deemed necessary by the SSHO;
2. Medical and biological wastes shall be disposed of in bags and containers which are designed and labeled specifically for disposal of such materials;
3. Personnel handling refuse from food handling areas will use rubber/latex gloves when cleaning trash receptacles; and
4. Personnel handling flammable/combustible wastes shall wear the level and type of PPE prescribed by the SSHO.

6.0 AUDIT CRITERIA

The following items related to site sanitation, illumination and house keeping will be audited to determine compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide personnel with general guidelines for the selection and use of personal protective equipment (PPE). Whenever possible, engineering or administrative controls will be used to prevent personnel exposures to chemical and physical hazards encountered during project tasks. Whenever engineering or administrative controls are not feasible or adequate, this SOP will be used to select the PPE necessary to ensure the safety and health of site personnel.

2.0 SCOPE

This SOP will be applicable to PIKA projects where PIKA personnel or its subcontractors are required to use PPE to reduce the risks of exposure to chemical, physical or biological hazards. Requirements and provisions for the use of PPE will be specified in a Activity Hazard Analysis AHA) included in a Site-specific Safety and Health Plan (SSHP) or an Accident Prevention Plan (APP). This SOP does not apply to the issuance or use of respiratory protective equipment which is addressed in SOP-513.

3.0 REFERENCES

This procedure follows guidelines provided in the following Occupational Safety and Health Administration (OSHA) and U.S. Army Corps of Engineers (USACE) standards listed below:

- 29 CFR 1910 Subpart I, OSHA General Industry Standard on PPE
- 29 CFR 1926 Subpart E, OSHA, Construction Standard on PPE
- USACE Engineering Manual 385-1-1, Section 05.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will coordinate with the Site Supervisor (SS) to acquire, store, and maintain the PPE and safety and health supplies required by the site specific SSHP or APP.

4.2 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve use of PPE to control personnel exposure to known or potential hazards. The SS will also discuss relevant sections of this SOP in the daily safety briefings, document the daily implementation of this SOP, and verify that personnel who use PPE are fully trained in its use.

4.3 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The CESHM is responsible for the continued development and review of this SOP and providing guidance to the project-specific Site Safety and Health Officer (SSHO) or Unexploded Ordnance Safety Officer (UXOSO) for sites with significant know or potential munitions and explosives of concern (MEC) safety hazards. The CESHM will also:

1. Identify/ investigate PPE products that afford a higher degree of protection or a level of protection not previously available;
2. Conduct a JSA for each task performed on site to identify the chemical, physical and biological hazards which will require use of PPE to reduce exposure risks;
3. Complete the site-specific certification of Activity Hazard Assessment (AHA), Form-529, for each task and specify in the AHA the PPE that will be required to reduce exposure risks;
4. Develop the PPE requirements for each project site based on the anticipated hazards and incorporate that information into the site specific SSHP or APP; and
5. Periodically inspect the PIKA project sites to ensure the provisions of this SOP are being implemented.

4.4 SITE SAFETY AND HEALTH OFFICER OR UNEXPLODED ORDNANCE SAFETY OFFICER

The SSHO or UXOSO is responsible for the on-site implementation of this SOP and will:

1. Provide initial training, as specified in this SOP, to inform site personnel of the selection, use, limitations, cleaning and maintenance of PPE used on site;
2. Issue PPE per site-specific SSHP or APP;
3. Assist site personnel with the inspection and maintenance of PPE;
4. Consult with the CESHM to determine the levels and types of PPE to be used for tasks not previously addressed;
5. Updating the AHA form with new tasks that were not previously addressed and forwarding to the CESHM for approval.
6. Conducting daily inspections and weekly audits of the site to determine if workers are safely complying with the PPE requirements of this SOP.

5.0 SELECTION OF PPE

5.1 INTRODUCTION

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

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

- Initiation of a new work phase or work that begins on a different portion of the site;
- Changes in job tasks during a work phase;
- Changes in the season/weather;
- Effectiveness of PPE is reduced due to temperature extremes or individual medical considerations;
- Previously unidentified contaminants are encountered;
- Change in ambient contaminant levels as a result of site operations; and
- Changes in work scope affect the degree of contact with contaminants.

If work tasks are added or amended after completion and approval of the project Safety Plans, the SSHO/ UXOSO will conduct the activity hazard assessment and consult with the CESHM. The level and type of PPE to be used will be identified and the SSHO/ UXOSO will complete the AHA Form-529. Any changes in PPE that involve downgrading the level of PPE will be allowed only after review by the CESHM.

5.2 SELECTION CRITERIA

The CESHM will utilize the general chemical resistance information found in Appendix B and Table 514-1 of this SOP, the manufacturer's permeation and breakthrough specifications, the requirements outlined in Appendix A, and the anticipated chemical and physical hazards, to select the level and types of PPE to be used for each task. During the selection of PPE the CESHM will also take into the consideration the following factors:

1. Limitations of the equipment;
2. Task duration;
3. Temperature extremes;
4. Material flexibility; and
5. Durability/Integrity of the equipment.

Once the specific types of PPE have been selected for each task, the SSHO/UXOSO, and if needed the CESHM, will work to locate approved PPE items that will properly fit each employee designated to wear PPE. Selection of respiratory protection will be conducted IAW SOP-513 of the PIKA CESHP.

5.3 PROVISION OF PPE

5.3.1 PIKA Provided PPE

In accordance with OSHA PPE guidelines, PIKA will provide PPE at no cost to a full-time employee or a temporary employee directly paid by PIKA. Part-time employees or employees provided by a third-party employment firm are not covered. In addition, PIKA also provides re-imbursement after supervisory approval:

1. For Safety footwear which is compliant with ANSI standard Z41 PT99. (Reimbursement is limited to $100.00 once every 24 months)
2. For prescription safety glasses with permanent side shields through the Safety Eye-wear Program (outlined within the employee handbook).

In addition, PIKA will pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE.

5.3.2 Exceptions

The items for which PIKA is not responsible for payment include the following:

1. Logging boots required by 29 CFR 1910.266(d)(1)(v);
2. Everyday clothing, such as long-sleeve shirts, long pants, and street shoes;
3. Clothing and accessories used solely for protection from weather (e.g. Winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, or ordinary sunglasses).

5.3.3 Employee Provided PPE

Where an employee provides adequate PPE he or she owns, PIKA may allow use and is not required to reimburse the employee for that equipment. PIKA shall not require an employee to provide or pay for his or her own PPE, except for items 1 – 3 listed in section 5.3.2 of this SOP.

6.0 TRAINING

6.1 TRAINING SCHEDULE

PIKA, contractor or subcontractor site personnel will be given initial, PPE-specific training, which complies with this section. This training will be given by the SSHO/ UXOSO or CESHM prior to personnel participating in site operations where PPE is required. PPE training will include the relevant topics outlined in paragraph 5.2 of this SOP. Site personnel will be given additional PPE training whenever any of the following occur:

1. The SSHO/ UXOSO has reason to believe that a previously trained employee's knowledge or use of assigned PPE indicates that the employee has not retained the requisite skill or understanding needed to properly use the PPE in question;

2. Changes in the work place render previous training obsolete; or
3. Changes in the types of PPE to be used render previous training obsolete.

6.2 REQUIRED TRAINING TOPICS

PIKA will provide affected site personnel with PPE training that covers the following topics:

1. The decisions and justifications used to select each piece of PPE;
2. The nature of the hazards and the consequences of not using PPE;
3. What PPE will be required for the conduct of each task;
4. When PPE will be required during the performance of each task;
5. How to properly don, doff, adjust and wear each piece of PPE;
6. The proper inspection, cleaning, decontaminating, maintenance and storage of each PPE item used; and
7. The limitations of the PPE.

Personnel provided PPE training will be required to demonstrate an understanding of the training topics and the ability to correctly use the PPE. This will be accomplished through the SSHO/ UXOSO supervising and visually inspecting each individual's ability to properly don and use the PPE during initial use of the PPE.

Upon completion of the training and after each employee has successfully demonstrated the requisite understanding, the SSHO/ UXOSO will complete the Personal Protective Equipment Training Form-530, which identifies: the employees who attended the training course and successfully demonstrated the required knowledge; the date(s) of the training and demonstration session(s); and the PPE covered by the training session.

7.0 LEVELS OF PPE

The following paragraphs outline the different levels of PPE that may be used by PIKA during the conduct of site activities. The levels described, do not identify specific makes, types or brands of PPE, since that information is site-specific, and is directly related to the nature and degree of hazards and contaminants which may be encountered at each site. These levels of PPE provide a general guideline and may be modified in project Safety Plans to address site-specific hazards and contaminants. Information related to the OSHA mandated requirements for different types of PPE is outlined in Appendix A of this SOP, and may be referenced when selecting specific PPE required for each level described below.

7.1 SPECIAL CONSIDERATIONS

The following special considerations shall be observed in the selection of PPE for the levels discussed below:

1. Hard hats are not required unless working around heavy equipment or an overhead hazard exists;
2. Steel toe/shank boots Will not be worn during surface/subsurface location of UXO unless a serious toe hazard exists, in which case a fiber safety toe will be used;
3. Safety glasses, goggles and face shields will be required only when an eye hazard exists, such as the potential for flying objects, chemical splash or contact with sharp objects;
4. When required, eye protection will be selected which provide site personnel with the best protection from not only physical hazards, but also provide adequate ultra violet radiation protection; and
5. The OSHA standards for PPE selection are vague concerning the selection of some particular types of specific PPE. Therefore, as part of the task hazard analysis, PIKA will evaluate site tasks to identify hazards and will provide the PPE that provides the necessary protection to ensure the safety and health of site personnel; regardless of the activity they perform.

7.2 LEVEL D PPE

This level of PPE is not allowed in areas of the site where atmospheric hazards are known or expected to exist. Level D should also be worn only if the activity in which personnel are engaged does not have the potential for splash, immersion or any other contact with hazardous substances. Level D involves the use of the following PPE:

1. Work clothes or coveralls (cotton);
2. Leather work gloves (optional unless hand hazards exist);
3. Leather work boots with safety toe (composite toe for UXO operations) ;
4. Hard hat (when working around heavy equipment or overhead hazards);
5. Safety glasses; and

7.3 MODIFIED LEVEL D PPE

Modified Level D affords protection from casual contact with contaminated soils and materials, but should not be worn whenever there is a potential for over exposure to airborne hazardous substances. Modified Level D involves the use of the following PPE:

1. Chemical resistant suit, with attached booties;
2. Five (5) minute escape mask (if the potential for airborne exposure exists);
3. Chemical resistant over boots;
4. Gloves – Cotton or latex inner liners and chemical resistant outer;
5. Boots - leather with safety toe;

6. Hard hat (when working around heavy equipment or overhead hazards); and
7. Eye protection - safety glasses or goggles.

7.4 LEVEL C PPE

Level C affords moderate protection from airborne hazards and should be worn where potential exposure may exceed the OSHA PEL or other published exposure limits. Level C with an air-purifying respirator can only be used for protection against chemicals and at concentrations for which NIOSH/MSHA approved cartridges exist. Level C will involve the use of the following PPE:

1. Chemical resistant suit with attached booties and hood;
2. Full face air purifying respirator with appropriate filters (NIOSH/MSHA approved);
3. Chemical resistant over boots;
4. Gloves - cotton liners, latex inner and chemical resistant outer;
5. Hard hat (when working around heavy equipment or overhead hazards); and
6. Leather work boots with safety toe.

7.5 LEVEL B PPE

Level B PPE offers superior protection against the inhalation of airborne contaminants. This is due to the fact that supplied air or self-contained breathing apparatus (SCBA) respirators are used as the respiratory protection for this level. However, the type of protective suit used with this level of protection is not airtight and dermal exposure to hazardous vapors is possible. Therefore, this level of protection is not acceptable for use where contact with the liquids or vapors that are extremely toxic or corrosive to the skin is anticipated. This level should not be used if the site contains CWM agents that present a serious safety or health threat via dermal contact. Level B can, however, be used at CWM sites under conditions where: 1) the CWM and other chemical hazards of concern are not acutely toxic to the skin; 2) there is no potential for liquid contact, and vapor levels are being continuously monitored; and 3) there is need to protect site workers from non-CWM hazardous wastes. Level B will involve the use of the following PPE:

1. Chemical resistant encapsulating or non-encapsulating suit;
2. SCBA or Supplied Air (NIOSH/MSHA Approved);
3. Coveralls or Scrubs - Cotton;
4. Chemical resistant over boots;
5. Chemical resistant Gloves with – cotton/latex liners;
6. Hard hat (when working around heavy equipment or overhead hazards); and
7. Leather work boots with safety toe.

7.6 LEVEL A PPE

Level A PPE provides the highest available level of protection against both inhalation and dermal contact of extremely hazardous materials. The Level A suit is fully

encapsulating, but unlike the Level B encapsulating suit, the Level A suit is air tight and must be tested prior to use to ensure that hazardous gases and vapors do not leak into the suit. Since Level A is usually worn in areas where highly toxic and corrosive materials are known to exist, the Level A suit must be constructed of materials capable of resisting degradation and permeation by the chemicals of concern, including CWM agents. Permeation and breakthrough data for the Level A suit to be used must show it is capable of resisting the chemicals expected to be found on site. Since Level A affords the greatest level of protection to dermal hazards, it will be worn in instances where potential for contact with liquid CWM exists, or when the nature and degree of potential exposure are unknown. Level A will also be worn in the event that site personnel are exposed and overcome by CWM, or other materials, and require rescue. Level A will involve the use of the following PPE:

1. SCBA, airline or a combination of both (NIOSH/MSHA approved);
2. Total-encapsulating chemical protective suit with attached boots and gloves;
3. Coveralls or Scrubs - cotton;
4. Gloves - cotton liners, latex inner and chemical resistant outer;
5. Boots - leather work boots (or equivalent), and chemical resistant over boots;
6. Chemical resistant boot covers (optional);
7. Disposable protective suit worn over totally encapsulating suit (optional); and
8. Hard hat (when working around heavy equipment or overhead hazards).

Note: Level A suits are to be worn either when there is risk of dermal contact from known chemicals/vapors or when the nature and level of exposure is unknown or has not been measured. The structural integrity and air tightness of the suit, and its seams, zippers and glove seals are extremely important. To ensure the air tightness of the suit, it should be tested IAW the manufacturer's requirements and the requirements found in Appendix A of 29 CFR 1910.120.

8.0 PPE DONNING PROCEDURES

8.1 INTRODUCTION

The purpose of the PPE donning procedures is to ensure that site personnel don the required PPE in a manner that will afford the greatest degree of protection. Failure to adhere to these procedures may result in the clothing and/or PPE being ineffective against potential contamination. The general donning procedures presented here are given as a general guide and may be altered by the SSHO/UXOSO if warranted by site operations and approved by the CESHM. Since these are general procedures, they may be modified by project Safety Plans which address site-specific hazards and may have unique requirements for PPE donning.

8.2 GENERAL REQUIREMENTS

This paragraph contains general procedures and requirements for donning levels of PPE. Specific procedures for donning each level of PPE are discussed in the paragraph immediately following the description of that PPE level. The general procedures/ requirements are as follows:

1. Prior to donning, gather the PPE required for performing the task specified for the day's operations;
2. Issuance of respiratory equipment will be through the SSHO/ UXOSO or his designated representative only;
3. Always inspect protective gloves, boots/boot covers, outer garment, and respiratory protective equipment for proper fit, integrity (i.e., rips, tears, holes), and function;
4. If wearing PPE other than Level A, and a small tear/rip is noticed during initial inspection or while engaged in site activities, it may be repaired using a small piece of duct tape;
5. If a tear/rip in protective clothing cannot be repaired with a small piece of duct tape, or if the tear/rip compromises the structural integrity of the clothing, that article of clothing will be replaced, even if this involves leaving the exclusion zone (EZ) to do so;
6. Whenever protective boots/boot covers or gloves are not part of the outer garment, use duct tape, or an equivalent, to connect the clothing to the gloves at the wrist and with the boots at the leg;
7. When taping boots or gloves to the suit, do not wrap the tape too tightly as this can cut off circulation and restrict movement, the goal is to simply attach the two to eliminate a route of entry for chemicals into the suit or gloves;
8. Whenever using tape, always leave a folded tab placed where it is visible and accessible for ease of removal;
9. If planned site activities will require walking, arm movement or bending, it is best to place tape over the zipper and seams at the stress points in the crotch, arm pits and back (where the shoulder seam and hood seam meet);
10. If kneeling will be necessary during site activities, avoid kneeling on any contaminated surfaces and place tape over the knee areas to reduce the possibility of wear and tear;
11. Consult with the SSHO/ UXOSO for any other improvements that would make the suit sturdier and or improve the comfort.

8.3 DONNING PROCEDURES FOR MODIFIED LEVEL D

To don Modified Level D, keep in mind the general recommendations above and then put on the PPE utilizing the steps listed below:

1. Put on chemical/splash resistant protective suit (suit should have attached booties);

2. Put chemical resistant boots on over the booties and tape the boots to the suit;
3. Make any strengthening modifications to the suit as deemed necessary by the planned site activities;
4. Assemble and adjust other PPE (hard hat, safety glasses, splash shield, etc.) and proceed toward the CRZ access point;
5. If ear plugs are to be worn, insert them before putting on inner and outer gloves, or any other PPE that might obstruct the proper insertion of the plugs;
6. Don other PPE (hard hat, safety glasses, splash shield, etc.), saving the inner and outer gloves for last;
7. Put on inner and outer glove of one hand and have buddy tape that hand, then tape one of the buddy's hands, and so on, until both hands are gloved and taped;
8. Proceed to the EZ access control point to be checked by the EZ access control attendant prior to being cleared for entry.

8.4 DONNING PROCEDURE FOR LEVEL C PPE

To don Level C, follow the general considerations listed in paragraph 7.2, then follow the steps listed below:

1. Put on chemical/splash resistant protective suit (suit should have attached booties and hood);
2. Put chemical resistant boots on over the booties and tape the boots to the suit;
3. Make any strengthening modifications to the suit as deemed necessary by the planned site activities;
4. Report to the SSHO/ UXOSO or the designated representative to check out the proper respirator and cartridge assembly;
5. Assemble and adjust other PPE (hard hat, safety glasses, splash shield, etc.) and proceed toward the CRZ access point;
6. If earplugs are to be worn, insert them before putting on inner and outer gloves, respirator, or any other PPE that might obstruct the proper insertion of the plugs;
7. Assemble respirator and cartridges and inspect the assembly for proper cleanliness and function;
8. Don the respirator and conduct a negative and positive pressure fit test to verify that the mask is not leaking;
9. Don other PPE (hard hat, safety glasses, splash shield, etc.), saving the inner and outer gloves for last;
10. Put on inner and outer glove of one hand and have buddy tape that hand, then tape one of the buddy's hands, and so on, until both hands are gloved and taped;
11. Proceed to the EZ access control point to be checked by the EZ access control attendant prior to being cleared for entry.

8.5 DONNING PROCEDURES FOR LEVEL B PPE WITHOUT ENCAPSULATING SUIT

The donning procedure outlined in this paragraph applies to Level B with a non-encapsulating suit. The donning procedures to be followed for Level B with a fully encapsulating suit are the same as those outlined for Level A in paragraph 7.6. To don Level B with a non-encapsulating suit, follow the general considerations listed in paragraph 7.2, then follow the steps listed below:

1. Report to the SSHO/ UXOSO or the designated representative to check out the proper SCBA respirator assembly;
2. Assemble and inspect the SCBA system for cleanliness and function;
3. Make sure that required PPE have been assembled at the location where it is to be donned, and make any adjustments to the equipment prior to starting the donning process;
4. While sitting, insert one leg after the other into the encapsulating suit, stand and don suit (suit should have attached booties and gloves);
5. While sitting again, put chemical resistant boots on over the booties and tape the boots to the suit;
6. Put on the air tank/harness assembly, adjust for a comfortable, snug fit and turn on the air at the tank, after first making sure the regulator valve is closed;
7. If earplugs are to be worn, insert them now, before putting the respirator face piece, or any other PPE that might obstruct the proper insertion of the plugs;
8. Don the SCBA face piece, but do not connect the airline at this time, and conduct a negative and positive pressure fit test to verify that the mask is not leaking;
9. Put on inner glove liner, inner gloves and outer gloves, and tape gloves to suit;
10. While connecting SCBA to the face piece, turn on the regulator valve and check air flow and breathing usability of the unit;
11. Once the suit and SCBA are situated and the assistant checks to determine if the wearer is breathing freely, and puts hard hat on wearer;
12. Proceed to the EZ access control point to be checked by the EZ access control attendant prior to being cleared for entry.

8.6 DONNING PROCEDURE FOR LEVEL A AND FULLY ENCAPSULATING LEVEL B PPE

To don Level A or Level B with an encapsulating suit, follow the general considerations listed in paragraph 7.6, and then follow the steps listed below:

1. Report to the SSHO/ UXOSO or the designated representative to check out the proper SCBA respirator assembly;
2. Assemble and inspect the SCBA system for cleanliness and function;
3. Make sure that required PPE has been assembled at the location where it is to be donned, and make any adjustments to the equipment prior to starting the donning process;

4. While sitting, insert one leg after the other into the encapsulating suit, stand and pull it up to the waist (suit should have attached booties and gloves);
5. While sitting, put chemical resistant boots on over the booties and tape the boots to the suit;
6. Put on the air tank/harness assembly, adjust for a comfortable, snug fit and turn on the air at the tank, after first making sure the regulator valve is closed;
7. If earplugs are to be worn, insert them now, before putting the respirator face piece, or any other PPE that might obstruct the proper insertion of the plugs;
8. Don the SCBA face piece, but do not connect the airline at this time, and conduct a negative and positive pressure fit test to verify that the mask is not leaking;
9. Put on inner glove liner and inner gloves then put on hardhat;
10. While connecting SCBA to the face piece, turn on the regulator valve and check airflow and breathing ease ability of the unit;
11. Insert the arms into the sleeves, being sure hands fit into the gloves properly, and have the assistant "adjust" the suit over the SCBA, face piece and hard hat;
12. Once the suit is situated and the assistant checks to verify the wearer is breathing freely, the assistant will zip up the suit and check closures and valves;
13. Proceed to the EZ access control point to be checked by the EZ access control attendant prior to being cleared for entry.

9.0 INSPECTION PROGRAM

9.1 INSPECTING INCOMING SHIPMENTS OF PPE

The SSHO/UXOSO or a designated appointee will inspect incoming shipments of PPE. This inspection will include verifying size, quantity, material and quality. Any deficiencies will be noted and defective material will be returned.

9.2 PRE-DONNING INSPECTION

Prior to donning PPE, site personnel will thoroughly inspect each piece of PPE to determine if it is in proper working order, and capable of protecting the employee from site hazards. As applicable, site personnel will check the following when pre-donning inspections are conducted:

- Chemical Resistant Clothing (suits, gloves, boots, etc.)
  - Check that clothing is made of proper material
  - Visually check seams, coating, zippers and look for tears
  - Check gloves and boots for pin holes
  - Stretch material and check flexibility and look for cracks
- Eye, Face and Head PPE
  - Ensure that equipment is ANSI approved
  - Check that hard hats are in good condition, with no cracks, or chemical/material buildup visible
  - Check hardhat headband for proper function and completeness

  - Ensure eye/face/head PPE fits comfortably and securely
  - Check safety classes and face shields for cracks or scratches that could impair vision or compromise structural integrity
  - Check safety glasses for side shields
- Fully-encapsulating Suits
  - Check operation of pressure relief valves and fitting of suit
  - Check face shield for cracks glazing or fogging
  - Ensure suit passes pressure test
  - Visually check seams, coating, zippers and look for tears
  - Check gloves and boots for pin holes
  - Stretch material and check flexibility and look for cracks
- Respirators
  - Inspect IAW PIKA SOP-513 Respiratory Protection of the PIKA CESHP

9.3 PERIODIC INSPECTIONS

During the work task, employees should periodically inspect each other's PPE for evidence of chemical damage/deterioration, such as discoloration, swelling, stiffening, or softening. Closure failure, tears, punctures, or seam discontinuities should also be inspected. If defective or deficient PPE is identified, it should be repaired or replaced immediately.

10.0 CLEANING AND DECONTAMINATION

The SSHO/UXOSO will be responsible for ensuring that PPE is in good, clean, working order prior to issuing the PPE the first time. Once issued, site personnel will ensure that re-usable articles of PPE are maintained in a clean sanitary fashion. For PPE items used inside an EZ, site personnel will follow the requirements of the site-specific Decontamination Plan and ensure that the PPE is properly decontaminated before removing the item from the EZ.

11.0 MAINTENANCE

Maintenance of PPE can vary based upon the complexity of the PPE and the intricacy of the repair involved. The SSHO/UXOSO will become familiar with the manufacturer's recommended maintenance and when possible repair defective PPE. If unable or unauthorized to conduct the repair, the SSHO/UXOSO will return the item to the manufacturer for repair, or procure a replacement.

12.0 STORAGE

PPE will be stored in a location that is protected from sunlight, damaging chemicals, moisture, extreme temperatures, impact or crushing. If needed, the SSHO/UXOSO will designate an area for the storage of PPE.

13.0 ATTACHMENTS

No attachments are associated with this SOP.

14.0 RELATED REFERENCE

OSHA 29 CFR 1910 Subpart E; Personal Protective Equipment.
OSHA 29 CFR 1926 Subpart I; Personal Protective Equipment

Table 514-1
Comparative Chemical Resistance

Key: E-excellent; G-good; F-fair; P-poor; NR-non recommended; *-limited service

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
A.	*Acetaldehyde	E	G	G	E
	Acetate	G	F	P	G
	Acetic acid	E	E	E	E
	*Acetone	G	E	P	E
	Acetylene gas	E	E	E	E
	Acetylene tetrachloride	F	NR	F	F
	Acrylonitrile	G	F	F	G
	Amidol	G	E	F	E
	Amine hardeners	F	F	G	G
	Ammonium hydroxide	E	E	E	E
	*Amyl acetate	F	P	P	F
	Amyl alcohol	E	E	E	E
	Anhydrous ammonia	G	E	E	E
	Aniline	G	F	P	F
	Aniline hydrochloride	F	G	P	F
	Aniline oil	F	G	P	F
	Animal fats	E	P	E	G
	Animal oils	E	F	E	G
	Anodex	G	E		E
	Anthracene	F	P	F	P
	*Aromatic fuels	P	NR	F	NR
	Arsine	E	E	E	E
	Asbestos	E	E	E	E
	Asphalt	G	F	E	F
B.	Banana oil	F	P	P	F
	*Benzaldehyde	F	F	G	G
	*Benzene	P	NR	F	NR
	Benzol	P	NR	F	NR
	Benzyl alcohol	E	E	E	E
	Benzyl benzoate	G	F	G	F
	*Benzyl chloride	F	P	F	G
	Blacosolve	G	P	G	P
	Boron tribromide	G	P	P	P
	Bromine	G	P	P	P
	Bromoterm	G	P	P	P
	Butane	E	F	E	F
	2-Butanone	G	G	F	G
	Butyl acetate	G	F	P	F
	Butyl alcohol	E	E	E	E
	*Butylaldehyde	G	G	E	G
	Butylene	E	G	E	G
C.	*Cadmium oxide fume	E	E	E	E
	Calcium hydroxide	E	E	E	E
	Carbolic acid	E	E	F	E
	Carbon dioxide	E	E	E	E
	Carbon disulfide	F	F	F	F
	*Carbon tetrachloride	F	P	G	P

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
	Castor oil	F	P	E	F
	Celiosolve	F	G	G	G
	Celiosolve acetate	G	F	G	G
	Chlordane	G	F	G	F
	Chlorine	G	F	F	G
	Chlorine gas	G	F	F	G
	*Chlorobenzene	F	P	P	F
	*Chloroacetone	F	F	P	E
	Chlorobromomethane	F	P	F	P
	*Chloroform	G	P	E	P
	Chloronaphthalene	F	P	F	F
	Chlorophenylene diamine	G	P	F	F
	Chloropicrin	P	P	P	F
	*Chlorothene	P	NR	F	NR
	Chromic acid	F	P	F	F
	Chromotex	G	G	G	G
	Citric acid	E	E	E	E
	Coal tar pitch volatiles	F	P	F	
	Cottonseed oil	G	G	E	F
	Cotton dust (raw)	E	E	E	E
	Creosole	G	G	F	G
	Cresol	G	G	F	G
	Cupric nitrate	G	G	E	E
	Cyanide	G	G	G	G
	Cyclohexane	G	F	G	F
	Cyclohexanol	G	F	E	G
	*Cyclohexanone	G	E	F	G
D.	Decaborane	F	P	F	F
	Degreasing fluids	F	P	G	P
	Diacetone alcohol	E	E	E	E
	Diborane	F	P	F	F
	*Dibetyl ether	G	G	F	G
	*Dibutyl phthalate	G	P	G	G
	Dichloroethane	P	NR	F	NR
	Dichloropropene	P	P	F	F
	Diesel fuel	G	P	E	P
	Diethanolamine	E	G	E	E
	Diethylamine	E	G	E	G
	Diethyltriamine	G	F	E	G
	Diisobutyl ketone	P	F	P	G
	Diisocyanate	G	P	G	E
	Dimethylformamide	F	F	G	G
	Dioctyl phthalate	G	P	E	F
	Dioxane	E	G	G	G
E.	Emulsifying agent	G	F	E	E
	Emulthogene	G	F	G	E
	Epichlorohydrin	G	P	F	G
	Epoxy resins dry	E	E	E	E
	*Esters	F	P	P	F
	Ethane gas	E	G	E	E
	Ethanol	E	E	E	E
	Ethers	E	G	G	G
	*Ethyl acetate	G	F	F	G

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
	Ethyl alcohol	E	E	E	E
	Ethyl bromide			P	
	Ethyl ether	E	G	G	E
	Ethyl butyl ketone			P	
	Ethyl formate	G	F	G	G
	Ethylaniline	F	F	P	G
	Ethylenediamine	E	G	E	G
	Ethylene dichloride	F	P	P	F
	Ethylene gas	E	G	E	E
	Ethylene glycol	E	E	E	E
	Ethylene oxide	G	F	G	
	Ethylene trichloride	F	P	G	P
F.	Fatty acids	E	P	E	F
	Ferrocyanide	F	G	G	E
	Fluoric acid	E	G	E	E
	Fluorine	G	F	F	G
	Fluorine gas	G	F	F	G
	Formaldehyde	E	E	E	E
	Formic acid	E	E	E	E
	Freon 11	G	P	G	F
	Freon 12	G	P	G	F
	Freon 21	G	P	G	F
	Freon 22	G	P	G	F
	*Furfural	G	G	G	G
G.	Gasoline - leaded	G	P	E	F
	Gasoline - unleaded	G	P	E	F
	Glycerine	E	E	E	E
	Glycerol	E	E	E	E
	Glycol	E	E	E	E
	Gold fluoride	G	E	E	E
	Grain alcohol	E	E	E	E
H.	Halogens	G	F	F	G
	Hexamethylenetetramine	F	G	F	G
	Hexane	F	P	G	P
	Hexyl acetate	F	P	P	F
	Hydraulic oil				
	ester base	E	P	F	G
	petroleum base	G	P	E	P
	Hydrazine	F	G	G	G
	Hydrochloric acid	E	G	G	G
	Hydrofluoric acid	E	G	G	G
	Hydrogen gas	E	E	E	E
	Hydrogen peroxide--30%	G	G	G	G
	Hydrofluosilicic acid	F	G	G	G
	Hydroquinone	G	G	F	G
I.	Inorganic salts	E	E	E	E
	Iodine	G	F	G	G
	Isooctane	F	P	E	P
	ISHPropanol	E	E	E	E
	ISHPropyl alcohol	E	E	E	E
K.	Kerosene	E	F	E	F
	Ketoners	G	E	P	E
L.	Lacquer thinners	G	F	P	F

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
	Lactic acid	E	E	E	E
	Lautric acid	E	F	E	E
	Lineoleic acid	E	P	E	F
	Linseed oil	E	P	E	F
M.	Maleic acid	E	E	E	E
	Mercuric chloride	G	E	G	E
	Mercury	G	G	G	E
	Methane gas	E	E	E	E
	Methanol	E	E	E	E
	Methyl acetate	G	F	P	G
	Methyl alcohol	E	E	E	E
	Methylamine	F	F	G	G
	Methyl bromide	G	F	F	G
	Methyl celiosolve	G	G	G	G
	*Methyl chloride	NR	NR	NR	NR
	*Methyl ethyl ketone	G	G	NR	E
	Methyl formate	G	F	F	G
	Methylene bromide	G	G	F	G
	Methylene chloride	G	F	F	G
	*Methyl isobutyl kelone	F	F	P	E
	Methyl methacrylate	G	G	F	E
	Mineral oils	E	F	E	F
	*Monochlorobenzene	F	P	P	F
	Monoethanolamine	E	G	E	E
	Morpholine	E	E	G	E
	Muriatic acid	E	G	G	E
N.	Naphthalene	G	F	G	F
	Naphthas aliphatic	E	F	E	F
	Naphthas, aromatic	G	P	G	P
	*Nitric acid	G	F	F	F
	*Nitric acid, red and white	P	P	P	P
	fuming	F	P	F	F
	*Nitrobenzene	F	P	F	F
	*Nitroethane	E	E	E	E
	Nitrogen gas	F	P	F	F
	*Nitromethane	F	P	F	F
	*Nitropropane	G	Q	G	G
	Nitrous oxide				
O.	Octyl alcohol	E	E	E	E
	Oleic acid	E	F	E	G
	Oxalic acid	E	E	E	E
	Oxygen liquid	F	P	NR	F
	Ozone	G	P	P	G
P.	Paint thinners	G	F	G	F
	Paint and varnish	G	F	F	F
	removers	E	E	E	E
	Palmitic acid	E	F	E	E
	*Paradichlorobenzene	P	F	F	F
	Parathion	F	P	F	F
	Pentaborane	F	G	G	G
	Pentachlorophenol	E	G	E	G
	Pentane	E	F	G	G
	Perchloric acid	F	NR	G	NR

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
	Perchloroethylene	E	NR	G	NR
	Perklene	E	F	E	NR
	Permachlor	G	P	E	
	Petroleum distiliates (naphtha)	E	F	E	F
	Petroleum spirits	E	F	F	G
	Phenol	G	P	G	G
	Phenylenediamine	G	G	G	G
	Phenylhydrazine	E	F	E	G
	Phil-sotv	E	G	E	E
	Phosphoric acid	G	G	G	E
	Pickling solution	E	G	E	G
	Picric acid	E	P	E	F
	Pine oil	E	P	E	F
	Pitch	E	E	E	E
	Plating solutions	G	G	G	E
	Potassium alum	G	G	G	E
	Potassium bromide	G	G	G	E
	Potassium chrome alum	F	F	F	E
	Potassium dichromate	G	G	G	E
	Potassium ferrocyanide	E	E	E	E
	Potassium hydroxide	E	G	G	G
	Printing inks	E	E	E	E
	Propane gas	E	E	E	E
	Propanol (iso)	G	F	F	G
	Propyl acetate	E	E	E	E
	Propyl alcohol	E	E	E	E
	Propyl alcohol (iso)	E	F	E	E
	Propylene gas	E	F	E	E
	Propyne gas	E	E	E	E
	Pyrethrum				
R.	*Red fuming nitric acid	P	P	P	P
	Rhodium fumes and dust	E	E	E	E
S.	Silver nitrate	E	G	E	E
	Skydrol 500	P	G	P	G
	Sodium carbonate metal	G	G	G	E
	Sodium hydroxide	E	E	E	E
	Sodium sulfite	G	G	E	E
	Sodium thiosulfide	G	G	E	E
	Solvarsol	E	F	E	F
	Solvessos	P	P	G	P
	Stearic acid	E	E	E	E
	Stoddard solvent	E	F	E	G
	Styrene	P	P	F	P
	Styrene 100%	P	P	F	P
	Sulfuric acid	G	G	G	G
T.	Tannic acid	E	E	E	E
	Tetrahydroborane	F	P	F	F
	Tetraethyl lead	E	F	E	G
	Tetrahydroluran	P	F	F	F
	*Toluene	F	P	F	NR
	Toluene diisocyanate	F	G	F	G
	*Toluol	F	P	F	NR

	CHEMICAL	NEOPRENE	LATEX OR RUBBER	MILLED NITRILE	BUTYL
	Trichlor	F	P	G	P
	*Trichloroethylene	F	F	G	P
	*Trichloroethane	P	P	F	P
	Tricresyl phosphate	G	F	E	F
	Tridecyl alcohol	G	F	E	F
	Triethanolamine	E	G	E	G
	Trinitrotoluene	G	P	G	F
	Trinitrotoluol	G	P	G	F
	Triptane	E	P	E	F
	Tung oil	E	P	E	F
	Turco No. 2996	P	P		F
	Turpentine	G	F	E	F
U.	Unsymmetrical Dimethylhydrazine	F	P	F	P
V.	Varnoline gas	E	F	E	F
	Vanadium fume and dust	E	E	E	E
	Varsol	G	F	G	F
	Vegetable oils	E	G	E	G
W.	Wood alcohol	E	E	E	E
	Wood preservatives	G	F	G	G
	*Woodyouth	F	P	F	G
X.	*Xylene	P	P	F	P
	*Xyiol	P	P	F	P
	*Xylidine	E	F	F	F
Z.	Zinc Chloride	E	E	E	E

APPENDIX A

SPECIFICATIONS FOR INDIVIDUAL TYPES OF PPE

Specifications for Individual Types of PPE

1.0 Introduction

The following information will be utilized during the task hazard assessment, and when determining which products will be used to fulfill the PPE requirements outlined in this SOP and the PPEP. This Appendix contains the OSHA requirements for eye, face, head, hand, body and foot protection.

2.0 General Requirements

Whenever process, environmental, chemical, radiological, or mechanical hazards exist on site, PIKA will ensure that affected personnel utilize appropriate PPE. When individual personnel provide their own PPE, PIKA will assure its adequacy and compliance, including proper maintenance and sanitation of said equipment.

3.0 Eye and Face Protection

When exposed to hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially harmful light radiation, employees must wear appropriate eye protection. The following shall apply when eye/face protection is required:

1. Side shields will, as a minimum, be used when there is a hazard from flying objects;
2. For personnel who wear prescription lenses, the eye protection will either incorporate the prescription in its design, or will be worn over the prescription glasses, without disturbing the position or comfort of the prescription glasses;
3. Eye and face PPE will be clearly marked with the manufacturer's name;
4. Eye and face protection will be selected and worn which protects personnel from the type of eye/face hazard encountered during a given operation;
5. If there is a potential for exposure to blood or other infectious fluids, personnel will be required to wear eye and face PPE capable of preventing fluid contact with the eye and face mucous membranes;
6. Eye and face protection devices shall be reasonably comfortable, fit snugly, be durable, easily cleaned and disinfected, and stored in a clean sanitary location;
7. Personnel involved in operations emitting hazardous light levels will wear appropriate filtered lenses; and
8. Protective eye and face devices will be clearly marked, indicating that they comply with the provisions of ANSI Z87.1.

4.0 Head Protection

When exposed to operations involving a potential for injury to the head, employees will wear appropriate head protection. Selection and use of head protection devices will comply with the following:

1. Head protection devices will be certified to be compliant with ANSI Z89,;
2. Head protection devices will be maintained and inspected to ensure they are in working order and that their structural integrity has not been compromised through exposure to chemicals, physical abuse or improper storage; and
3. Head protection devices will be selected IAW the type and degree of head hazard anticipated for site activities.

5.0 Foot Protection

When there is a danger of foot injury due to falling or rolling objects, or objects capable of piercing the sole, or other identifiable hazards, will be required to wear appropriate foot protection. Selection and use of foot protection will comply with the following:

1. Foot wear used on site will comply with ANSI Z41;
2. The degree of foot protection will be consistent with the degree of hazard anticipated for each site operation; and
3. At a minimum, footwear will be leather work boots.

6.0 Hand Protection

When there is a danger of hand injury due to skin absorption, contact with hazardous substance, cuts, lacerations, abrasions, punctures, thermal burns, electrocution, temperature extremes, or pinching, employees will be required to wear appropriate hand protection. Selection and use of hand protection will comply with the following:

1. PIKA will select hand protection based upon an evaluation of the performance characteristics of the protection device, relative to the task to be performed, conditions present, duration of use, and the known or potential hazards identified;
2. If site personnel have the potential to contact blood or other infectious materials they will as a minimum wear surgical type latex; and
3. Chemical resistant gloves that come in contact with known contaminated materials will be discarded after each use.

7.0 Body Protection

When injury to the body trunk or limbs could occur, employees will be required to wear appropriate protective devices. Operations where use of body/limb protection devices may be required include:

1. Working in hot environments - cooling vest;
2. Working in cold environments - insulated coveralls, long underwear;
3. Brush/tree clearing with a bladed weed eater and Tree/limb removal with a chain saw – steel/composite toed boots or toe guards, and Kevlar leg chaps;
4. Lifting heavy objects - lumbar/back support belts, knee support devices; and
5. Rendering first aid - body apron.

APPENDIX B

PROTECTIVE CLOTHING MATERIAL GUIDE

Tyvek7: Product of Dupont. Spun-bounded non-woven polyethylene fibers; has reasonable tear, puncture, and abrasion resistance; provides excellent protection against particulate contaminants, with very limited chemical resistance; and is inexpensive and suitable for disposable garments.

Polyethylene: Used as a coating on polyolefin material such as Tyvek7, increasing resistance to acids, bases, pesticides, and salts.

Saranex7: Made of Saran, a Dow product. Coated on Tyvek7. it is a very good general-purpose disposable material. Better overall protection than Polyethylene. Resistant to PCB's and chlorinated hydrocarbons.

Barricade7: A Dupont material with better general chemical resistance than Saranex7. Barricade is a thick, tightly seamed material that may be suitable for re-use, depending upon contaminant type and level. Provides excellent protection from a large variety of acids, caustics, organic solvents, and salts.

Responder7: One of the strongest limited-use materials, with a multi-layer construction. Responder7 is one of the few materials with no breakthrough times less than eight hours for the ASTM F1001 test chemicals. It is also the only commercially available material that has been actively tested against CWM.

Butyl rubber: Resists degradation by many contaminants except halogenated hydrocarbons and petroleum compounds, a common deficiency of most protective materials. Especially resistant to permeation by toxic vapors and gases. Expensive material used in boots, gloves, splash suits, aprons, and fully encapsulating suits.

Natural rubber: This is also a synthetic latex. Resists degradation by alcohols and caustics. Used in boots and gloves.

Neoprene: Resists degradation by caustics, acids, and alcohols. Used in boots, gloves, and respirator face pieces and breathing hoses. Commonly available and inexpensive.

Nitrile: Also referred to as Buna-N, milled Nitrile, Nitrile latex, NBR, acrylonitrile. Resists degradation by petroleum compounds, alcohols, acids, and caustics. Used in boots and gloves. Nitrile is commonly available and inexpensive.

PVAJ: Polyvinyl alcohol. Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds. Major drawback is its solubility in water. Used in gloves.

PVC: Polyvinyl chloride. Resists degradation by acids and caustics.

Viton7: Product of Dupont. Fluoroelastomer that is similar to Teflon. This materials consists of excellent resistance to degradation and permeation by aromatic and chlorinated hydrocarbons, and petroleum compounds. It is very resistant to oxidizers. However, it is extremely expensive material used in gloves and fully encapsulating suits.

SilverShield7: Lightweight, flexible Norfoil laminate with excellent chemical resistance. Suggested for vinyl chloride, acetone, ethyl ether, and a large variety of other toxic solvents and caustics. Often used as an over glove for haz-mat situations. Flexible material, but not stretchable, may tear at the seams if overly stressed.

4H: Five layer patented plastic laminate material intended to provide at least four hours of protection from over 280 chemicals and mixtures. Provides excellent protection against epoxy, organic solvents, acids, bases, paints, degreasers and adhesives. Flexible material, but not stretchable, may tear at the seams if overly stressed.

Chloropel7: Also referred to as CPE or chlorinated polyethylene. ILC Dover product. Used in splash suits and fully encapsulating suits. No data on permeability. Considered to be good all-around protective material.

Nomex7: Product of Dupont. Made from an aromatic polyamide fiber, it is noncombustible and flame resistant up to 220°C, thus providing good thermal protection, and is very durable and acid resistant. Used in fire fighters' turnout gear and some fully encapsulating suits as a base for the rubber.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of on and off road motor vehicles. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel, and operations involving the use of on and off road motor vehicles. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926.601;
- Applicable sections of Department of Transportation 49 CFR Part 100-199 and 571; and
- USACE EM 385-1-1, Section 18.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

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

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CSHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CSHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.

2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related the implementation of this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve vehicle operating procedures and hazards. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel involved with vehicle operation are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURE

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

5.1 GENERAL REQUIREMENTS

"Motor Vehicle" shall mean any vehicle propelled by a self contained power unit, or equipment designed for use on paved roads. All-purpose utility vehicle (APUV) shall mean any four wheeled or greater vehicle propelled by a self contained power unit designed for use off road. Every person regularly or occasionally operating a motor vehicle shall possess a valid permit for the equipment being operated. No motor vehicle shall be placed in service until it has been inspected and found to be in safe operating condition.

All motor vehicles shall be inspected and maintained IAW this program. Motor vehicles being used shall be checked at the beginning of each day to assure that the parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use. The part, equipment and accessories of concern include service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, and fire extinguishers where such equipment is necessary. Vehicles not meeting safe operating conditions shall be removed from service, repaired or replaced, and re-inspected before being placed back in service.

All motor vehicles operated between sunset and sunrise shall have the following lights:

1. Two headlights, one on each side.
2. At least one red taillight and one red or amber stop light on each side.
3. Directional signal lights both front and rear.

All motor vehicles, except APUV's, trailers or semitrailers having a gross weight of 5,000 pounds or less, shall be equipped with service brakes and manually operated parking brakes. Service and parking brakes shall be adequate to control the movement of, to stop, and to hold the vehicle under various conditions of service. Service brakes on trailers and semitrailers shall be controlled from the driver's seat of the prime mover.

Braking systems on every motor vehicle shall be so designed as to be in approximate synchronization on all wheels and develop the required braking effort on the rearmost wheels first unless the vehicle is equipped with an "Anti-lock Braking System" (ABS). The design shall also provide for application of the brakes by the driver of the prime mover from the cab. Exceptions to this are vehicles in tow by an approved tow bar hitch.

Every motor vehicle shall be equipped with the following equipment:

1. A working speedometer;
2. A fuel gauge;
3. An audible warning device in operating condition;
4. A windshield equipped with an adequate powered windshield wiper;
5. An operable defrosting and defogging device;
6. And an adequate rear view mirror or mirrors;
7. Cabs, cab shields, and other protection shall be provided to protect the driver from the hazards of falling or shifting materials;
8. Non-slip surfaces shall be provided on steps;
9. Glass in windshields, windows, and doors shall be safety glass;

10. Cracked or broken glass shall be replaced;
11. All towing devices shall be structurally adequate for the weight drawn and be properly mounted; and
12. All motor vehicles shall be equipped with a power operated starting device.

All trailers will be equipped as follows:

1. A locking device or double safety system, shall be provided on every fifth wheel mechanism and tow bar arrangement which will prevent the accidental separation of towed and towing vehicles; and
2. Every trailer shall be coupled with safety chains or cables to the towing vehicle. Such chain or cable shall prevent the separation of the vehicles in the event of failure of the tow bar.

When operated on public highways, buses, trucks, and combinations of vehicles with a carrying capacity of 12 tons or greater shall be equipped with emergency equipment required by state laws but not less than those listed below.

1. One red flag not less than 12 inches square and 3 reflective markers which shall be available for immediate use in case of emergency stops.
2. Two wheel chocks for each vehicle or each unit of a combination of vehicles.
3. At least one fire extinguisher rated at 20 BC units, with at least two such rated fire extinguishers being required for flammable cargos; including MEC/MD.
4. Vehicle exhaust shall be controlled so that it will present no hazards to the operator, passengers, or other personnel.
5. Records of tests and safety inspections shall be maintained at the site and shall be available on request.
6. All rubber tired motor vehicles shall be equipped with fenders. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

5.2 OPERATING RULES

No motor vehicle shall be driven at a speed greater than the posted speed limit, with due regard for weather, traffic, intersections, width and character of the roadway, type of motor vehicle, and any other existing condition. The operator must, at all times, and under all conditions, have the vehicle under such control as to be able to bring it to a complete stop within the assured clear distance ahead. To accomplish this, the operator shall follow the safe operating rules presented below.

1. Headlights shall be switched to low beam when approaching other vehicles.
2. No motor vehicle shall be driven on a downgrade with gears in neutral or clutch disengaged.
3. Every motor vehicle, upon approaching an unguarded railroad crossing or drawbridge, shall be driven at such a speed as to permit stopping before

reaching the nearest track or the edge of the draw and shall proceed only if the course is clear.

4. No motor vehicle shall be stopped, parked, or left standing on any road or adjacent thereto or in any area in such a manner as to endanger the vehicle, other vehicles, equipment, or personnel using or passing that road or area.
5. No motor vehicle shall be left unattended until the motor has been shut off, the key removed (unless site regulations prohibit), the parking brake set, and the gear engaged in low, reverse, or park.
6. If stopped on a hill or grade, front wheels shall be turned or hooked into the curb or the wheels securely chocked.
7. Personnel shall not be permitted to get between a towed and towing vehicle except when hooking or unhooking.
8. No motor vehicle or combination of vehicles, hauling unusually heavy loads or equipment shall be moved until the driver has been provided with required permits, the correct weights of the vehicles and load, and a designated route to be followed.
9. When backing or maneuvering, operators will take the applicable precautions and whenever possible, use a backing guide.
10. Operators of motor vehicles transporting personnel, explosives, flammable, or toxic substances shall stop at railroad crossings or drawbridges and shall not proceed until the course is determined to be clear. A stop shall not be required at a crossing within a business or residential district; protected by a watch person, traffic officer or by a traffic signal giving a positive indication to approaching vehicles.
11. When a bus, truck, or truck/trailer combination is disabled or parked on the traveled portion of a highway or the shoulder adjacent thereto, red flags shall be displayed during the daytime and reflector, flares, or electric lights at night. An exception may be made in residential or business sections or municipalities.
12. The principles of defensive driving shall be practiced.
13. Seat belts will be installed and worn per 49 CFR 571 (DOT).
14. If the windshield wipers are in use due to rain, headlights will be activated.

5.3 TRANSPORTATION OF PERSONNEL

The number of passengers in passenger type vehicles shall not exceed the number of seats equipped with approved seat belts. Trucks used to transport personnel shall be equipped with a seating arrangement securely anchored, a rear gate, guardrail and steps or ladders, for mounting and dismounting. The beds of trucks which are not equipped with appropriate safety devices as described in this paragraph, will not be used to transport personnel unless absolutely necessary and never on a public highway, unless it is an emergency. Additional personnel transportation requirements are listed below.

1. All tools and equipment shall be guarded, stowed, and secured when transported with personnel.
2. No person will be permitted to ride with arms or legs outside of truck body, in a standing position on the body, or on running boards, or seated on side fenders, cabs, cab shields, rear of truck, or on the load.
3. All motor vehicles transporting personnel during cold or inclement weather shall be enclosed.
4. No explosives, flammable materials (except normal fuel supply), or toxic substances shall be transported in vehicles being used to transport personnel.
5. No motor vehicle transporting personnel shall be moved until the driver has ascertained that persons in the vehicle are seated and the guardrail and rear gate are in place or doors closed.
6. Getting on or off any vehicle while it is in motion is prohibited.

5.4 FUELING

All motor vehicles shall be shut off during fueling operations, and no smoking or open flames will be permitted within 50 feet of fueling operations. Care should be taken not to spill fuel, and only that fuel recommended by the manufacturer shall be used. During fueling where there is a potential for fuel contact with the skin, especially during cold weather, personnel will wear protective gloves as specified in the SSHP.

5.5 LOADING

Drivers of trucks and similar vehicles shall leave the cab if the cab of the vehicle being loaded is exposed to danger from suspended or overhead loading operations, unless the cab is adequately protected. No motor vehicle shall be loaded so as to obscure the driver's view ahead or to either side or to interfere with the safe operation of such vehicle. Motor vehicles carrying loads which project more than 4 feet beyond the rear of the vehicle shall carry a red light at or near the end of the projection at night or when atmospheric conditions restrict visibility. During daylight periods or other non-restricted conditions a red flag not less than 12 inches square shall be used. The load shall be distributed, chocked, tied down, or secured.

5.6 ALL TERRAIN VEHICLES/ UTILITY VEHICLES

During the operation of ATVs/UTVs, every operator shall possess a valid state driver's license and have completed, as a minimum, an on-site training course prior to operation of the vehicle (IAW EM 385-1-1 Section 18). The operation of ATVs/UTVs shall be in strict compliance with the requirements stated in EM 385-1-1 Section 18.

5.7 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Except for the personal protective equipment (PPE) requirements identified previously, no special PPE requirements apply to this SOP.

6.0 AUDIT CRITERIA

The following items related to power and hand tool operations will be audited to determine compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Safety Training Attendance Log (Form-503); and
- The Vehicle Inspection Checklist and Report Form (Form-507).

7.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving heavy equipment, to include backhoes, excavators, front-end loaders, and other heavy equipment with the exception of cranes. The operation of cranes is outlined in the PIKA SOP-301, Crane Safety. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Site Safety and Health Plan (SSHP) or Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including contractor and subcontractor personnel, and operations involving the use of heavy equipment. This SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

- OSHA Construction Standard 29 CFR Part 1926, Subpart O (as applicable).
- OSHA Industry Standard 29 CFR Part 1910, Subpart N (as applicable).
- USACE EM 385-1-1, Safety Manual, Section 18, MOTOR VEHICLES, MACHINERY AND MECHANIZED EQUIPMENT.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the equipment that personnel will require to perform safe heavy equipment operations. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CSHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to hazard identification and the protective measures applicable to this SOP.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve personnel operating heavy equipment or personnel exposed to heavy equipment hazards. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel involved with the inspection, operation and maintenance of heavy equipment are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 PROCEDURES

5.1 GENERAL REQUIREMENTS

All personnel, including contractor and subcontractor personnel, involved in heavy equipment operations shall be familiar with the potential safety and health hazards associated with the conduct of this operation, and with the work practices and control techniques to be used to reduce or eliminate these hazards. In the event that munitions and explosives of concern are present in the work site, the procedures for anomaly avoidance and soil excavation will be presented in the project plans.

The operator prior to use on each shift shall inspect heavy equipment and an Equipment Inspection Checklist and Report Form (Form-508) shall be completed to determine that operating components are not defective.

- Vehicles will not have cracked windshields or windows.
- Blades, buckets, dump bodies, and other hydraulic systems must be fully lowered when equipment is not in use.
- Parking brakes will be engaged when equipment is not in use.

5.2 PROTECTION DEVICES

Seat belts and Rollover Protective Structures (ROPS) will be provided and used on heavy equipment and motor vehicles including:

- Crawler and rubber tire tractors;
- Self-propelled pneumatic tire earth movers;
- Motor graders;
- Water tank trucks with tank height less than the cab; and
- Self-propelled construction equipment such as front-end loaders, backhoes, rollers, and compactors.

ROPS will not be required on:

- Trucks designed for hauling on public highways;
- Crane-mounted dragline backhoes;
- Cranes, draglines, or equipment on which the operator's cab and boom rotate as a unit and sections of rollers and compactors (tandem steel-wheeled and self-propelled pneumatic tire type that do not have an operator's station);

Falling Object Protective Systems (FOPS) will be provided on bulldozers, tractors, excavators or similar equipment used in clearing operations or when the operator is exposed to falling object hazards. FOPS include guards, canopies, or grills to protect the operator from falling or flying objects as appropriate to the nature of the clearing operations.

5.3 REQUIRED SAFETY EQUIPMENT

Mechanical and Material handling equipment with an obstructed rear view must have (when being operated in reverse) an audible alarm sufficient to be heard under normal working conditions and will operate automatically upon commencement of backward motion. Self-propelled equipment must be equipped with a backup alarm unless the equipment allows the operator to face the direction of motion.

- Material handling equipment that lack ROPS must be operated on grades that the equipment can safely accommodate.
- A safety barrier will be used to protect workers whenever tires are inflated, removed, or installed on split rims.

- All self-propelled heavy equipment must carry a dry chemical or carbon-dioxide fire extinguisher with a minimum rating of 5-B:C.
- Gas cylinders must be properly secured to heavy mobile equipment.
- Hard hats, safety glasses, safety shoes, high visibility vests and other protective gear are to be worn when working within 25' of heavy equipment such as providing safety observer support. When working in an environment with multiple heavy equipment, continued operations or situations which limit visibility all personnel in the work are will wear specified PPE. The SSHO will define the heavy equipment work area.

5.4 SAFE PRACTICES

When heavy equipment and verbal communication is difficult, standard hand signals shall be used. Designate one person per equipment operator to give hand signals.

1. The operation of heavy equipment shall be limited to authorized personnel specifically trained in its operation;
2. A competent person shall visually inspect heavy equipment daily prior to operation, and report any abnormalities/deficiencies to the SSHO;
3. The operator shall use the safety devices provided with the equipment, including seat belts, and backup warning indicators and horns shall be maintained in operable order;
4. While in operation, personnel not directly required in the area shall keep a safe distance from the equipment;
5. The operator's cab shall be kept free of non-essential items and loose items shall be secured;
6. Personnel shall avoid moving into the path of operating equipment and areas blinded from the operator's vision shall be avoided;
7. Heavy equipment requiring check-out shall not be permitted to run unattended;
8. Except for equipment designed to be serviced while in operation, equipment shall be shut down and positive means taken to prevent its operation while repair or servicing is being conducted;
9. All equipment shall be secured at the end of the day, or when not in operation, with the blades/buckets of earth moving equipment placed on the ground;
10. Equipment operated on the highway shall be equipped with turn signals visible from the front and rear;
11. Stationary machinery and equipment shall be placed on a firm foundation and secured before being operated;
12. All points requiring lubrication during operation shall have fittings so located or guarded to be accessible without hazardous exposure;
13. Heavy equipment operating within an off-highway job site not open to public traffic, shall have a service brake system and a parking brake system capable of stopping and holding the equipment fully loaded on the grade of operation;

14. All equipment with windshields shall be equipped with powered wipers, and equipment that operates under conditions that cause fogging or frosting of windshields shall be equipped with operable defogging or defrosting devices;
15. Whenever the equipment is parked, the parking brake shall be set, and equipment parked on inclines shall have the wheels chocked or track mechanism blocked and the parking brake set;
16. Personnel shall not work or pass under the buckets or booms of loaders in operation;
17. When heavy equipment must negotiate in tight quarters, or if operators of earth moving equipment cannot see the bucket, a secondary person shall be stationed to guide the operator;
18. Additional riders shall not be allowed on equipment unless it is specifically designed for that purpose (i.e., there is an additional seat with a seat belt);
19. Only trained or licensed people are to operate heavy equipment;
20. Use chains, hoists, straps, and any other equipment to aid in safely moving heavy materials;
21. Never walk directly in back of, or to the side of, heavy equipment without the operator's knowledge;
22. Be sure that no underground or overhead power lines, sewer lines, gas lines, telephone lines, or other utilities present a hazard in the work area. This includes marking of underground utilities and flagging support wires for utility poles. Guy lines will be marked with yellow caution tape at eye level and several other points to aid in visual identification;
23. Be knowledgeable of marked "swing zones" for rotating equipment, e.g., backhoes, track hoes and excavators.

5.5 MAINTENANCE PRACTICES

The following procedures will be followed for maintenance of heavy equipment.

1. Tagout equipment that is or needs to be serviced.
2. Never work under a machine that is supported only by the boom and bucket. Use heavy-duty wooden blocks under the crawlers when working under the machine.
3. When working on the boom, arm, or bucket, lower the bucket to the ground.
4. If necessary to inspect, service, or repair the machine with its boom and arm up, apply safety blocks and struts.
5. Use extreme caution when removing the radiator cap. If the engine is still hot, boiling water may spray out. If possible, wait until the engine has cooled.
6. Gas generated from battery electrolyte is flammable so do not smoke or expose open flames when servicing the batteries. Also, make sure to keep this electrolyte off clothing and skin, and out of eyes. Never use a match to check battery levels.

7. Stop the engine when filling the fuel tank and be sure there are no open flames or heated surfaces that could ignite the fuel.

5.6 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposures associated with heavy equipment operations. These requirements will be implemented unless superseded by site-specific requirements stated in the SSHP or APP.

1. Heavy equipment operators will have received training which addresses the safe operation of the equipment to be used; and
2. Heavy equipment operators shall wear the level of personal protective equipment as specified in the SSHP or APP.

6.0 AUDIT CRITERIA

The following items related to heavy equipment operations will be audited to determine site compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

No attachments associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of hand and power tools. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel involved with the use of hand or power tools. This SOP does not address pneumatic tools that are addressed in PIKA SOP-307, Pneumatic Tool Safety. Additionally, this SOP is not intended to contain all requirements needed for complete regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

- OSHA General Industry Standard 29 CFR 1910, Subpart P, Hand and Portable Powered Tools and Other Hand-Held Equipment.
- OSHA Construction Industry Standard 29 CFR 1926 Subpart I, Tools – Hand and Power.
- USACE EM 385-1-1, Section 13, Hand and Power Tools.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) is responsible for the overall implementation of this SOP for PIKA projects to which the PM has been assigned and to which this SOP applies. In this role, the PM will be responsible for the acquisition and management of the PIKA personnel, equipment and training resources needed to implement this SOP.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CSHM) is responsible for the continued development, improvement, and implementation of the PIKA Corporate CESHP, to include this SOP. To accomplish this end, the CSHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.

2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to task hazards and their protective measures.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will implement this SOP for operations that involve personnel exposure to the hazards associated with electrical equipment and for which electric safety requirements are necessary for safeguarding employees. The SS will also discuss relevant sections of this SOP in the daily safety briefings and properly document relevant information related to implementation of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

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

5.0 PROCEDURE

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

5.1 POWER TOOLS

Power tools have great capability for inflicting serious injury upon personnel if they are not used and maintained properly. To control the hazards associated with power tool operation, the safe work practices listed below shall be observed when using power tools:

1. Operation of power tools shall be conducted by authorized personnel familiar with the tool, its operation, and safety precautions;
2. Power tools shall be inspected prior to use, and defective equipment shall be removed from service until repaired;
3. Power tools designed to accommodate guards shall have such guards properly in place;
4. Loose fitting clothing or long hair shall not be permitted around moving parts;
5. Hands, feet, etc., shall be kept away from moving parts;

6. Maintenance and/or adjustments to equipment shall not be conducted while it is in operation or connected to a power source;
7. An adequate operating area shall be provided, allowing sufficient clearance for operation;
8. Electrical tools shall be operated IAW the specifications outlined in the PIKA SOP-523, Electrical Safety; and
9. Good housekeeping practices shall be followed.

5.2 HAND TOOLS

Use of improper or defective tools can contribute significantly to the occurrence of on-site accidents. Therefore, the work practices listed below shall be observed when using hand tools:

1. Hand tools shall be inspected for defects prior to each use;
2. Defective hand tools shall be removed from service and repaired or properly discarded;
3. Tools shall be selected and used in the manner for which they were designed;
4. Be sure of footing and grip before using any tool;
5. Do not use tools that have split handles, mushroom heads, worn jaws, or other defects;
6. Gloves shall be worn to increase gripping ability and/or if cut, laceration or puncture hazards exist during the use of the tool;
7. Safety glasses or a face shield shall be used if use of tools presents an eye/face hazard;
8. Do not use makeshift tools or other improper tools;
9. When working overhead, tools shall be secured to prevent them from falling;
10. Use non-sparking tools in the presence of explosive vapors, gases, or residue;
11. If hand tools become contaminated they must be properly decontaminated, bagged, marked and held for disposition by the client on-site coordinator; and
12. Tools used in the EZ which have porous surfaces, such as wooden or rubber coated handles, shall be discarded as contaminated upon termination of site activities, unless testing can prove the absence of contamination.

5.3 CONTROL SWITCHES AND CRANKS

Hand-held power sanders, grinders with wheels of 2 inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jig saws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive on-off control.

The use of cranks on hand-powered winches or hoists is prohibited, unless they are equipped with positive self-locking dogs. Hand wheels without projecting spokes, pins, or knobs will be used.

6.0 SAFETY AND PPE REQUIREMENTS

The following safety measures and personal protective equipment shall be used in preventing or reducing exposures associated with power and hand tool operations. These requirements will be implemented unless superseded by specific requirements stated in the SSHP.

1. Hard hat and safety boots shall be worn when working with power or hand tools;
2. Safety glasses with side shields shall be worn when operating, servicing or working around hand or power tools;
3. Hearing protection shall be worn if hand/power tool operation has the potential for noise exposures greater than 85 dBA TWA;
4. Leather, or other protective, gloves shall be worn when using hand/power tools; and
5. Protective face shields shall be worn for operations which have the potential for generating flying fragments, objects, chips, particles, etc.

7.0 AUDIT CRITERIA

The following items related to power and hand tool operations will be audited to ascertain site compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Daily Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

8.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures designed to prevent accidental energizing of equipment that can result in the release of stored mechanical, electrical, pneumatic, or chemical energy. Equipment, process systems, and machines requiring service or maintenance shall be de-energized and secured prior to servicing or maintenance via lockout/tagout (LO/TO) practices. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel, and operations involving exposure stored and hazardous energy. This SOP is not intended to contain all of the Federal, state or client references needed for complete compliance with all requirements. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

- OSHA 29 CFR 1910.147, Control of Hazardous Energy.
- OSHA 29 CFR 1926.417, Lockout and Tagging of Circuits.
- USACE EM 385-1-1, Section 12, Control of Hazardous Energy (Lockout/Tagout).

4.0 DEFINITIONS

As used in this procedure, the following terms apply:

1. **Affected Employee** - An employee who is required to operate or use a machine or equipment (i.e., backhoe, drill rig, nibbler, etc.) on which servicing or maintenance is being performed under lockout or tagout, or who is required to work in an area in which servicing or maintenance is being performed.
2. **Authorized Employee** - An employee who locks out or tags out machines or equipment in order to perform maintenance or servicing on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing services or maintenance covered under this procedure.
3. **Lockout (LO)** - The placement of a lockout device, such as a lock with key, on an energy isolating device, in accordance with an established procedure,

ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

4. **Energy Isolating Device** – Is a mechanical device that physically prevents the transmission or release of energy. For example: A manually operated electrical circuit breaker or a disconnect switch. The term does not include a push button, selector switch, and other control type devices.
5. **Tagout (TO)** - The placement of a tagout device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed in accordance with the established procedure.
6. **Servicing and/or Maintenance** - Work place activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines, process systems, or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or startup of the equipment and the release of hazardous energy or hazardous substances.

5.0 RESPONSIBILITIES

5.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the equipment that personnel will require to safely control hazardous sources of energy (i.e., to perform LO/TO). The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

5.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CSHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CSHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to visitor entry and protective measures.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

5.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve personnel exposure to known or potential sources of stored hazardous energy. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel who conduct operations involving the control of hazardous energy sources are fully trained and qualified as outlined in this SOP.

5.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

6.0 PROCEDURES

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

6.1 PREPARATION FOR SHUTDOWN

The following steps will be conducted prior to the shutdown or isolation of machines or equipment for servicing or maintenance:

1. Lockout and tagout procedures shall be implemented by an authorized personnel only;
2. Authorized personnel shall fully understand the type and magnitude of the energy to be controlled, the means necessary for energy isolation/control, and be able to recognize applicable hazardous energy sources;
3. Prior to maintenance or servicing, the authorized personnel will shut down equipment or machinery by the normal stopping procedure (close valve, open switch, etc.);
4. Sources of hazardous energy will be physically located and the equipment or machine will be deactivated from those energy sources so that the equipment or machine is completely isolated (electrical, hydraulic, pneumatic, etc.);

5. Locks/Tags shall be assigned to each authorized employee by the SSHO, and a LO/TO Device Issuance Log will be completed Form-534; and
6. The authorized personnel conducting the LO/TO will notify affected personnel in the area that maintenance and servicing is required, and that the equipment or machine must be shut down and locked/tagged out to perform the maintenance or servicing.

6.2 APPLICATION OF LO/TO DEVICES

The following procedural steps will be followed whenever LO/TO must be conducted to allow for the complete control of hazardous energy;

1. Once energy sources have been identified, authorized personnel who will be conducting servicing or maintenance shall affix their own assigned lock and/or tag to the energy controlling devices leading to the equipment or machine;
2. The locks and/or tags will be used to hold these energy controlling devices in a safe or off position;
3. Stored or residual energy must be dissipated or restrained, as with hydraulic systems, gas, steam, and water pressure, etc., by such methods as blocking and/or bleeding of the stored/residual energy;
4. When the configuration of the controlling device for equipment or machines cannot be secured with a lock, a tag will be used in place of the lock and additional measures will be taken (remove fuses, blocking lines, disconnecting power supply, etc.) to bring the equipment or machines to a zero-energy state; and
5. When tagout devices are used instead of lockout devices, they must be applied in such a manner as to provide the same level of personnel protection as would be afforded by a lockout device.

6.3 VERIFICATION OF ISOLATION

Authorized personnel responsible for the LO/TO will witness or individually verify that the equipment or machine is completely de-energized by:

1. Determining that no employees are exposed;
2. Attempting to actually energize or activate the equipment or machine using the normal operational control; and
3. Testing the equipment or machine to verify will not operate.

If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation will be continued until servicing or maintenance has been completed, or the potential for accumulation no longer exists. After these steps have been accomplished, the authorized person(s) conducting the verification will return the operating controls to the "off" or "neutral" position. Only after these verification steps

have been accomplished can the equipment or machinery be considered safe for servicing or maintenance.

6.4 RELEASE FROM LO/TO

In order to conduct safe and effective removal of LO/TO devices, the following steps will be conducted to allow release from LO/TO:

1. The authorized person(s) who conducted the LO/TO will inspect the area in and around the equipment or machine to determine that non-essential items (tools, spare parts, etc.) and affected employees have been safely removed or repositioned to a safe location;
2. The authorized person(s) will verify that the operating controls are in the "off" or "neutral" position;
3. The authorized person(s) will notify affected personnel in the area that the equipment or machine is to be re-energized;
4. The authorized person(s) who originally placed the LO/TO devices will remove the lock(s) and/or tag(s) from the energy controlling device(s), and re-energize the equipment or machine;
5. The authorized person will notify affected personnel in the area that the equipment or machine is ready for use; and
6. Lock(s) and/or tag(s) shall be returned to the SSHO when the maintenance/ servicing task is complete.

6.5 ABSENCE OF THE AUTHORIZED PERSON(S) DURING REMOVAL

These procedures are to be followed whenever the authorized person(s) who placed the LO/TO devices is not on site (sick or vacation) at the time of removal. If the authorized employee is on site, the LO/TO device(s) shall be removed only by the person to whom it was assigned.

In the event that the authorized person(s) cannot be located on site, the SSHO will make reasonable attempts to determine that the authorized person(s) is in fact not on site at the time of removal. Once it has been established that the authorized person(s) is not on site, the LO/TO device(s) assigned may then be removed by the SSHO in conjunction with the SSHO. When the authorized employee returns to the facility, he/she will be informed by the SSHO that the LO/TO devices were removed during his/her absence

6.6 GROUP LO/TO

When equipment or machine maintenance or servicing is performed by a group of individuals, group LO/TO will be utilized to provide for the safety of affected individuals.

Primary responsibility for the safe operation of group LO/TO will be vested in the SSHO, who will conduct the following:

1. Ascertain the exposure status of individual personnel with regard to the lockout or tagout of the equipment or machine; and
2. Will coordinate the affected work forces and to maintain continuity of protection.

During operations that involve more than one authorized person, each authorized person will affix their personally assigned LO/TO device to the group lock, group lock box, or comparable mechanism. This will be accomplished when each person begins work and removal of these LO/TO devices shall occur only when work on the equipment or machine has been completed. Once each individual lock/tag has been affixed and the authorized personnel have verified the LO/TO, the normal LO/TO procedures, as outlined in Sections 7.1 thru 7.5, shall be followed.

6.7 SHIFT OR PERSONNEL CHANGE

Specific instruction shall be utilized during shift or personnel changes to maintain the continuity of LO/TO protection, including provision for the orderly transfer of locks or tags between off-going and on-coming employees. This shall be conducted to minimize personal exposure to hazards from the unexpected energizing or start-up of the equipment or machine, or the release of stored energy.

6.8 TRAINING AND COMMUNICATION

6.8.1 Training of Affected Personnel

Each person working in the area where LO/TO procedures must be implemented shall be instructed in the purpose and use of the LO/TO procedure, and about the prohibitions related to attempts to re-start or re-energize equipment or machinery which are locked or tagged out.

6.8.2 Lockout Training for Authorized LO/TO Personnel

Each person who will be authorized to conduct LO/TO procedures shall receive training in the following areas prior to using this procedure:

1. The function and purpose of this SOP;
2. Recognition of hazardous energy sources;
3. Types and magnitude of the hazardous energy which may be encountered on site;
4. The means necessary for energy isolation and control;
5. Where tags may be used, training will include procedures for affixing tags and a discussion of the limitations of tagout; and

6. Hands-on practice training with locks and tags prior to implementing LO/TO activities.

6.8.3 Tagout Training for Authorized Employees

In the event that only tagout procedures and techniques are used on site, authorized personnel shall be trained in the following limitations of tags:

1. Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock;
2. When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated;
3. Tags must be legible and understandable by authorized and affected personnel whose work operations are, or may be, in the area;
4. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use; and
5. The importance of the fact that tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered on site.

6.8.4 Employee Retraining

Retraining of authorized and affected personnel shall be conducted at least annually to reestablish employee proficiency and to introduce new or revised control methods and procedures. Retraining will also be conducted whenever the periodic inspections, as outlined in Section 8.0 of this SOP reveal inadequacies in the authorized person's knowledge or use of this LO/TO SOP. Also, retraining may be necessary due to changes in job assignments, equipment, machinery, or processes that introduce a new hazard.

7.0 LOCKOUT/TAGOUT MATERIALS AND HARDWARE

The locks, tags, chains, key blocks, or other devices for isolating, securing, blocking, bleeding or isolating energy source shall be provided to the authorized personnel at no charge to these personnel. These devices shall be identified and used solely for the purpose of LO/TO.

7.1 LOCKOUT/TAGOUT DEVICE REQUIREMENTS

LO/TO devices utilized for protection against unexpected energizing or start up of the equipment or machines, or release of stored energy shall meet the following requirements:

1. LO/TO devices shall be of durable construction capable of withstanding the environment for the maximum period of time these devices are exposed.

2. Tagout devices shall be constructed and printed so that exposure to weather conditions or corrosive environments will not cause the tag to deteriorate or become illegible.
3. LO/TO devices shall be standardized within the facility by color, shape, and/or size, and print and format of tagout devices shall be standardized.
4. Lockout devices will prevent removal without the use of excessive force or unusual techniques, such as bolt cutters or metal cutting tools.
5. Tagout devices, including their means of attachment, shall prevent inadvertent or accidental removal.
6. The material used to attach a tagout device shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, environment-tolerant nylon cable tie.
7. Tagout devices shall warn against hazardous conditions if the equipment or machine is energized and shall include a legend such as: **DO NOT START**; **DO NOT OPEN**; **DO NOT CLOSE**; **DO NOT ENERGIZE**; **DO NOT OPERATE**, etc.
8. Lockout and tagout devices shall indicate the identity of the employee applying the device(s).

7.2 OTHER PROTECTIVE MATERIALS

Authorized LO/TO personnel will be supplied other protective materials such as blanks, blocks, chains, supports, to assist in the control of the potentially hazardous energy.

8.0 PERIODIC INSPECTIONS

The SSHO shall conduct periodic inspections of the onsite LO/TO procedures at least monthly to determine that this SOP and its requirements are being followed.

9.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Site personnel shall wear and utilize the type and level of PPE outlined in the SSHP or specified by the SSHO when conducting LO/TO operations.

10.0 AUDIT CRITERIA

The following LO/TO related items will be audited to determine compliance with this SOP:

- The Daily Task and Safety Briefing Log (Form-502);
- Past archived project-specific canceled tagout tags;
- The Lockout/Tagout Issuance Log (Form-534);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Safety Training Attendance Log (Form-503); and

- The Daily Inspection and Weekly Audit Report Form (Form-506).

11.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to manual lifting and material handling. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including subcontractor personnel, and operations involving manual lifting and material handling. This SOP is not intended to contain all requirements needed for regulatory compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REGULATORY REFERENCES

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

- Applicable sections of OSHA Construction Industry Standard 29 CFR Part 1926, Subparts H and N.
- Applicable sections of OSHA General Industry Standard 29 CFR Part 1910, Subpart H.
- USACE EM 385-1-1, Section 14 Material Handling Storage and Disposal.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for approving the purchase of and authorizing the resources needed to implement this SOP, and shall also incorporate this SOP into site specific plans, procedures and training for sites where this SOP is to be implemented.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.

3. Providing the Site Safety and Health Officer (SSHO) with consultation related to lifting, materials handling and protective measures.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will implement this SOP for operations that involve personnel exposure to the hazards associated with manual lifting and material handling. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record in the appropriate site documentation the relevant information related to the implementation of this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

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

5.0 PROCEDURE

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

5.1 SAFE MATERIAL HANDLING AND LIFTING TECHNIQUES

The safety and health hazards and operational control techniques to be used during conduct of material handling operations are discussed below.

5.1.1 Engineering Controls

Whenever heavy or bulky material is to be moved, the size, shape, weight, distance and path of movement of the object must be considered, and the following hierarchy shall be followed in selecting a means for material handling:

1. Elimination of material handling need through engineering design;
2. Movement of the material by mechanical device (i.e., a lift truck, crane etc.);
3. Movement by manual means using mechanical aid (i.e., dolly or cart); and
4. Movement by manual means.

5.1.2 Safe Work Practices

The following fundamentals address the proper manual material lifting procedures:

1. At no time will an employee attempt to lift an item individually which weights more than 50 pounds.
2. A firm grip on the object is essential, therefore the hands and object shall be free of oil, grease and water, which might prevent a firm grip;
3. The hands, and especially the fingers shall be kept away from any points that cause them to be pinched or crushed, especially when setting the object down;
4. The item shall be inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces and pinch points, and gloves shall be used, if necessary, to protect the hands;
5. The feet shall be placed far enough apart for good balance and stability;
6. Personnel shall determine that solid footing is available prior to lifting the object;
7. When lifting, get as close to the load as possible, bend the legs at the knees, and keep the back as straight as possible;
8. To lift the object, the legs are straightened from their bending position;
9. Never carry a load that you cannot see over or around;
10. When placing an object down, the stance and position are identical to that for lifting, with the back kept straight and the legs bent at the knees, the object is lowered;
11. If needed, personnel shall be provided with back support devices to aid in preventing back injury during lifting activities;
12. Materials will not be moved over or suspended over personnel unless positive precautions have been made to protect personnel from falling objects; and
13. Where movement of materials may be hazardous to persons, taglines or other devices shall be used to control loads being handled by hoisting equipment.

5.1.3 Two Person Lifting

When two or more people are required to handle an object, coordination is essential to verify that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each person, if possible, shall face the direction in which the object is being carried.

5.2 MATERIAL STORAGE

The general guidelines listed below shall be followed when materials are stored on site. For more detailed guidelines pertaining to the storage of specific items such as lumber, bricks, pipe, reinforcing steel, etc., consult the references listed in Section 3.0 of this SOP.

1. Materials shall be stored in orderly piles or stacks away from walkways and roadways, and access ways around stored material shall be kept clear;

2. Materials stored in tiers, whether in bags, containers or bundles, shall be stacked, blocked or interlocked and limited in height to prevent sliding or collapse and maintain stability;
3. Materials shall be stored at a height that is as low as practical and shall not be stored at a height greater than 20 feet;
4. Flammable and combustible materials shall be stored IAW applicable regulations;
5. Personnel shall be in a safe position while materials are being loaded or unloaded from vehicles;
6. Non-compatible materials shall not be stored together; and
7. Reusable lumber shall have all nails that could pose a hazard to personnel withdrawn before being stored.

5.3 SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment shall be used for the prevention of accidents associated with material handling operations. These requirements will be implemented unless superseded by site-specific requirements stated in the SSHP.

1. When handling materials, proper gloves will be worn to prevent puncture, laceration or abrasion; and
2. Gloves will be selected according to the nature, material and condition of the item(s) to be lifted.

6.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Daily Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

7.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum safety and health requirements and procedures applicable to the conduct of operations involving the use of electricity. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to PIKA personnel, including contractor and subcontractor personnel, and operations involving electrical safety requirements that are necessary for the practical safeguarding of employees in their workplaces. This SOP is not intended to contain all of the requirements needed for complete regulatory and client compliance. Consult the documents listed in section 3.0 of this SOP for additional for compliance issues.

3.0 REFERENCES

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

1. OSHA Construction Industry Standard 29 CFR Part 1926, Subpart K;
2. OSHA General Industry Standard 29 CFR Part 1910, Subpart S; and
3. USACE EM 385-1-1, Section 11 Electrical.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for the safe planning and performance of each project to which they are assigned. The PM will work with the Site Supervisor (SS) to acquire the PPE and safety and health supplies required by the project Safety Plans. The PM will coordinate with the SS to make available adequate project resources to acquire, store and maintain the equipment which site personnel will need to safely perform the electrical work identified in this SOP. The PM will also take a lead role in the integration of the safety and health personnel and resources to the operational processes to assist in the identification and control of site and task hazards prior to and during the project.

4.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for:

1. Conducting an annual review of this SOP and making modifications as necessary.
2. Developing or reviewing site plans that specify the personal protective equipment (PPE) and other hazard controls that apply to the implementation of this SOP.
3. Providing the Site Safety and Health Officer (SSHO) with consultation related to visitor entry and protective measures.
4. Periodically auditing PIKA work sites to determine their compliance with this SOP.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) will be responsible for the implementation of this SOP for those operations that involve personnel exposure to known or potential electrical safety hazards. The SS will also discuss relevant sections of this SOP in the daily safety briefings and will record information related to the daily implementation of this SOP in appropriate site documentation. The SS will also verify that personnel who conduct operations involving the control of hazardous energy sources are fully trained and qualified as outlined in this SOP.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will provide assistance and consultation to the SS regarding the implementation of the requirements in this SOP, and will provide oversight to personnel during project operations. The SSHO will discuss the safety and health hazards and control techniques associated with this SOP during the initial site hazard training and the daily safety briefings. The SSHO will also be responsible for daily inspection of site operations and conditions to assess their initial and continued compliance with this SOP and other regulatory guidelines.

5.0 DEFINITIONS

As used in this procedure, the following definitions apply:

1. **Ampacity -** The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.
2. **Attachment Plug** – A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.
3. **Circuit Breaker** – (600 volts nominal, or less) A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined over current without injury to itself when properly applied

within its rating. (Over 600 volts, nominal) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuits.

4. **Fitting** – An accessory such as a lock nut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.
5. **Fuse** – An over current protective device with a circuit opening fusible part that is heated and severed by the passageway of over current through it.
6. **Ground** – A conducting connection, whether international or accidental, between an electrical circuit or equipment and earth, or to some conducting body that serves in place of the earth.
7. **Grounded** – Connected to the earth or to some conducting body that serves in place of the earth.
8. **Grounding Conductor**– A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.
9. **Ground Fault Circuit Interrupter (GFCI)** – A device for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the over current protective device of the supply circuit.
10. **Intrinsically Safe Equipment and Associated Wiring** – Equipment and associated wiring in which any spark of thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitable concentration.
11. **Qualified Person** – One familiar with the construction and operation of the equipment and the hazards involved.

6.0 PROCEDURES

6.1 GENERAL REQUIREMENTS

Electrical installations must comply with the National Electrical Safety Code, the National Electrical Code, and applicable state codes, and Underwriters Laboratories (UL) or Factory Mutual Laboratories approval is required for electrical wire, conduit, apparatus, or equipment. Additionally, equipment shall be operated and maintained in accordance with the manufacturers' recommendations.

6.2 PROTECTION OF EMPLOYEES

Work shall be planned, assigned, and performed to avoid coming into physical contact with an electric power circuit. The circuit should be de-energized and grounded, and

verified by a qualified person. If not possible, isolation, insulation, warning signs, and other methods shall be used. Additional protective measures shall be as follows:

1. Only qualified electricians shall be allowed to perform work on electrical circuits and equipment and energized lines and equipment. Live wiring and equipment shall be guarded to prevent accidental contact.
2. Prior to excavation and demolition activities, efforts must be made to note the exact location of buried electric power lines and other utilities.
3. High voltage equipment shall be isolated, guarded, and signed with "Danger, High Voltage" warnings.
4. Work adjacent to overhead power lines shall not be initiated until a survey has been made to ascertain the safe clearance from energized lines (see Table 11-3 of EM 385-1-1).
5. Any overhead line shall be considered to be energized unless, and until, the person owning such line assures that it is not energized and it has been visibly grounded.
6. Operations adjacent to overhead lines are prohibited unless the power to the line has been shut off and positive means taken to prevent it from being accidentally energized, or the required clearances can be met and the minimum clearance distance has been posted at the operator's position.
7. Personnel conducting installation, removal or maintenance operations involving electrical supplies will use proper lock out/tag out procedures to deenergize the systems where the work is being conducted.

6.3 TEMPORARY WIRING

Temporary wiring shall not be subject to physical damage and be handled in accordance with the following.

1. Non-metallic or insulated fasteners shall be used to fasten temporary wiring at intervals not to exceed 10 feet.
2. No temporary wiring shall be laid on the floor.
3. Receptacles shall be of the grounding type.
4. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.
5. Temporary wiring shall be guarded, buried, or isolated (e.g., ten foot minimum vertical clearance above walkways) to prevent accidental contact, and shall not be fastened with staples, hung from nails or suspended by wires.
6. Patched, oil-soaked, worn, frayed, electrical cords, or cords that have the outer coating compromised shall not be used, and may only be repaired using approved replacement parts.
7. Outdoor wiring or wiring in tunnels, shafts, trenches, etc., shall be weatherproof. Note: Wiring/electrical installation in hazardous locations must meet NEC standards (see also OSHA 29 CFR 1926.407, "Hazardous Locations").

8. Wiring in conduits shall have bushings at outlets and terminals.
9. Extension cords shall be three-wire grounded type, UL listed.

6.4 TEMPORARY LIGHTING

Procedures for the use of temporary lighting procedures shall be as follows:

1. Portable hand lamps shall be of the molded composition or other type approved for the purpose, and hand lamps shall be equipped with a handle and a substantial guard over the bulb that is attached to the lamp holder or the handle. Temporary lamps that may be damaged by site operations shall be protected from breakage or accidental contact by the use of bulb guards.
2. Temporary lights shall not be suspended by their electric cords unless designed for this means of suspension.
3. Sharp corners and projections shall be avoided. Whenever flexible cords must pass through doorways, or other pinch points, protection shall be provided.
4. Receptacles available for uses other than temporary lighting shall not be installed on branch circuits that supply temporary lighting.

6.5 GROUNDING – GROUND FAULT PROTECTION

6.5.1 General requirements

At construction sites either ground fault circuit interceptors or an assured equipment-grounding program shall be in place. For ground fault protection, 115- and 120-volt, single-phase, 15- and 20-ampere receptacle outlets shall be protected by a UL listed ground-fault circuit interrupter. UL listed ground fault circuit interrupters (GFCIs), calibrated to trip with a threshold of 5 milli amps (ma) $\pm$ 1 ma, are required on circuits used for portable electric tools. Exception: Two-wire, single-phase, portable or vehicle-mounted generator rated 5 kW or less, where the circuit is insulated from the generator frame and other grounded parts.

6.5.2 Equipment Grounding Program

An assured equipment-grounding program requires a written program that sets forth specific procedures for compliance with OSHA 29 CFR 1926.404. To comply with this standard, the PIKA Equipment Grounding Program will include the following:

1. Wiring, electrical circuits, tools, and equipment shall be effectively grounded (the exception is double-insulated UL approved tools).
2. Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation

damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

3. The tests listed below shall be performed on cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded.
4. Equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
5. Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
6. Required tests shall be performed:
   a. Before first use;
   b. Before equipment is returned to service following any repairs;
   c. Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and
   d. At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.
7. PIKA shall not make available or permit the use by employees of any equipment that has not met the requirements of item 5 above.

Tests performed as required in this paragraph shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record.

6.6 OVER-CURRENT PROTECTION

Switches, fuses, and circuit breakers shall be properly labeled to identify their circuits, and outdoor switches, fuses, and circuit breakers shall be protected from the elements. Additionally, fuses or circuit breakers shall protect feeder and branch circuits.

6.7 ELECTRICAL OUTLETS

Outlets must have a cover plate, no exposed or bare wires, and no loose connections. Cords should always be removed from an outlet by grabbing the plug, not by pulling on the cord, and a plug with a ground pin should be used to ground equipment to the facility ground.

6.8 LOCKOUT/TAGOUT

Prior to performing any work on a circuit or on equipment run by an electric circuit, the circuit shall be de-energized, locked out and tagged. Consult PIKA SOP-521 Control of Hazardous Energy (Lockout/Tagout) for lockout procedures. Capacitors in the locked out circuit shall be disconnected and removed prior to work.

7.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Daily Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

8.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 OBJECTIVE

The objective of this Standard Operating Procedure (SOP) is to define the general requirements for the site-specific monitoring and sampling that may be required for project sites with airborne exposure potential. This SOP will help direct personnel to effectively conduct monitoring and sampling to effectively protect the site workers, the environment and the general public from chemical and physical hazards.

2.0 SCOPE

This SOP applies to PIKA munitions and explosives of concern (MEC) and hazardous, toxic or radiological waste (HTRW) projects where site activities require the use of monitoring or sampling equipment under the provisions of OSHA 29 CFR 1910.120. This procedure may also apply to industrial processes where monitoring/sampling of chemical or physical hazards is conducted.

3.0 REFERENCES

The following Occupational Safety and Health Administration (OSHA) and technical references apply to the conduct of operations associated with this SOP. In the event that operational hazards are encountered when implementing this SOP, consultation of other SOPs and regulatory references may be needed. This SOP is also intended to fulfill the requirements of the applicable sections of OSHA standards 29 CFR 1910.120 and 1910.1000, as well as other Federal, state and local regulations.

1. OSHA Industrial Hygiene Technical Manual. OSHA Instruction CPL 2-2.20A.
2. NIOSH Pocket Guide to Chemical Hazards.
3. NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Cincinnati, OH.
4. United States Army Corps of Engineers (USACE) Engineering Manual (EM) 385-1-1, Safety and Health Requirements Manual
5. American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Values (TLVs) and Biological Exposure Indices;

4.0 DEFINITIONS

Approved Laboratory - is a laboratory which participates in an approved Quality Assurance and Quality Control (QA/QC) Program and is accredited by the American Industrial Hygiene Association (AIHA).

Breathing Zone (BZ) - an imaginary hemisphere, forward of the shoulders, with a radius of six to nine inches.

Direct Reading Instruments - Instruments that provide real-time readings of the chemical or physical hazards to which a worker may be exposed.

Personal Sampling - The sampling conducted to determine personnel exposure to chemical or physical hazards.

Point Source Monitoring - is conducted with the instrument intake placed near the potential contaminant source. This type of monitoring gives an indication of the potential for the source to cause an over exposure or IDLH situation.

Work Area Monitoring - is conducted in the immediate work area where exposures are likely to be the highest. Monitoring is usually conducted in the breathing or hearing zones of the workers.

Perimeter Monitoring - involves sampling along the down wind perimeter of the Exclusion and/or Contamination Reduction Zones to determine if contaminants are migrating from the site.

Hearing Zone (HZ) - is the area around the head where noise monitoring is conducted. It is defined as an imaginary globe of one-foot radius surrounding the ears.

5.0 RESPONSIBILITIES

5.1 PROJECT MANAGER

The Project Manager (PM) is responsible for the overall implementation of this SOP for PIKA projects to which the PM has been assigned and to which this SOP applies. In this role, the PM will be responsible for the acquisition and management of the PIKA personnel, equipment and training resources needed to implement this SOP.

5.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development of this SOP and for determining the proper implementation of its requirements. The CESHM is also responsible for the following:

- Development of the Site Sampling & Monitoring Plan (SSMP) to be incorporated in the SSHP;
- Providing consultation to and assisting the Site Safety and Health Officer (SSHO) with the selection and acquisition of monitoring and sampling equipment;
- Assisting the SSHO with the field implementation of the SSMP;
- Periodically reviewing new technologies to identify monitoring/sampling instruments or methods which could more effectively detect and quantify chemical or physical hazards;
- Periodically inspecting site operations to determine if monitoring activities comply with the SSMP; and
- Annually reviewing this SOP and providing updates as needed.

5.3 SITE SAFETY AND HEALTH OFFICER

The SSHO is responsible for the field implementation of this SOP and the SSMP. To achieve this goal, the SSHO will also be responsible for the following:

- Acquiring, with assistance from the CESHM, the instruments and resources required for implementing the SSMP;
- Arranging for, or providing, training for PIKA personnel who will actively participate in conducting site monitoring;
- Conducting, or supervising PIKA personnel conducting, monitoring for chemical and physical hazards;
- Ensuring that instruments and equipment used for site monitoring and sampling are inspected, calibrated and maintained according to manufacturer specifications; and
- Ensuring that monitoring data is accurately recorded on the PIKA Site Monitoring Log.

5.4 SITE SUPERVISOR

The Site Supervisor (SS) is responsible for the proper implementation of the SSMP and the procedures outlined in this SOP. This includes the proper allocation of on-site project resources to ensure that personnel are adequately trained properly use site monitoring and sampling equipment. Additionally, the SS will assist the SSHO in the performance of site sampling and monitoring and in training site personnel in the needs and importance of site sampling and monitoring.

6.0 SITE-SPECIFIC PLANS REQUIRED

Exposures to chemical and physical hazards during HTRW site activities can present a significant threat to the health and safety of site workers. Therefore, in order to control or limit potential exposures, the SSMP shall be designed to identify and, to the extent possible, quantify the site hazards. The information listed in this section will be used by the CESHM when designing the SSMP. An effectively designed SSMP will allow for the following:

- Identification of immediately dangerous to life or health (IDLH) conditions;
- Assessment of worker's exposure to chemical and physical hazards;
- Identification of high risk activities;
- Determination of the need and/or effectiveness of control methods and zones;
- Selection of appropriate personal protective equipment (PPE);
- Delineation of areas where PPE is required; and
- Determination of the need for site-specific medical surveillance monitoring.

6.1 EVALUATION OF SITE CHARACTERIZATION DATA

During the development of the SSHP, the CESHM will collect and review available site information to identify the chemical and physical hazards that may be encountered

during site activities. This review should include, whenever possible, the following elements:

- A review of documents which identify materials placed or buried on site;
- Interviews of personnel who may have been involved in past disposal operations at the site;
- A review of data from previous environmental sampling conducted on or near the site;
- A reconnaissance of the site, conducted from outside the perimeter; and
- An examination of past photographs of the site, including aerial photos.

6.2 EVALUATION OF PLANNED SITE ACTIVITIES

Once site characterization data has been obtained, the CESHM will review the planned site activities to determine if they will increase the potential for worker exposure. The CESH will also determine if the activities themselves will create a potential for exposures to safety and health hazards.

6.3 SELECTION OF MONITORING EQUIPMENT AND PROCEDURES

The CESHM will select site monitoring equipment and procedures that will most effectively detect, and when possible, quantify the site hazards. The principle method for qualifying the potential for personnel exposures is the use of real-time, direct reading instruments (DRI). The equipment used for quantifying worker exposures includes personal air sampling pumps and contaminant specific collection media. These, as well as other specific monitoring devices, will be discussed in detail in section 7.0 of this SOP. Whenever possible and feasible, the CESHM will select DRIs capable of giving quantitative, real-time readings. This will allow for the rapid assessment of the worker's potential exposure. If contaminant or hazard specific, real-time DRIs are not available, then qualitative instruments may be used, provided that adequate allowances are made for ensuring employee protection.

6.4 DETERMINATION OF ACTION LEVELS

When designing the SSMP, the CESHM will define the monitoring Action Level (AL) for each contaminant or physical hazard. These levels will identify the values or concentrations where PPE will be up or down graded and determine when other forms of control are required. The ALS outlined in the SSMP will be based on the information collected during the site characterization phase, and will include when applicable, the following:

- The acute toxicity of the contaminant;
- The potential health effects caused by exposure;
- The amount of contamination present in soil/water;
- The volume of contaminants placed/buried on site;

- The potential for contaminant release during site activities;
- The impact site activities will have on the potential for exposure or release; and
- The ability to effectively quantify the airborne concentrations using DRIs.

In the event that an AL for a particular airborne contaminant is achieved when monitoring with a DRI, personal BZ samples may need to be collected to more accurately evaluate worker exposures. This requirement will be defined in the SSMP, and will be conducted IAW Section 8.0 of this SOP.

6.5 SELECTION OF MONITORING LOCATIONS AND FREQUENCIES

The CESHM will define the locations where monitoring will be conducted for each contaminant or physical hazard. The basic locations are point source, work area, perimeter and breathing zone (BZ). The monitoring plan will usually contain provisions for monitoring each location to allow for complete coverage of the site, and to maintain a safe working environment. The procedures for conducting monitoring in each location will be discussed in Section 8.0 of this SOP. The frequency for monitoring each contaminant or physical hazard will be selected by the CESHM and will be based on the type of site activities, the nature of the hazard and the potential for exposure.

7.0 EQUIPMENT REQUIREMENTS

As specified above, monitoring with real-time, DRIs is the principle method used for screening, monitoring and assessing chemical and physical hazards found on site. Also used on site are integrated sampling devices and special air sample collection techniques such as evacuated flasks and cylinders and teldar collection bags. The following gives a brief description of the equipment and procedures for conducting site monitoring with DRIs.

7.1 DIRECT READING INSTRUMENTS

DRIs used on site are defined as portable instruments capable of providing real-time detection and monitoring of chemical or physical hazards. These instruments allow the SSHO to rapidly assess exposure levels and determine the necessary precautions needed for worker protection. The information from DRIs is also used in the continued development of the SSMP by indicating the chemical and/or physical hazards which may require additional monitoring/sampling. Use of DRIs will be conducted IAW Section 8.1 of this SOP.

DRIs have inherent constraints in their ability to detect hazards. While some instruments may be used for full shift integrated sampling, many are non-specific and will detect a large range of chemical or physical hazards. The types of contaminants and physical hazards detectable with DRIs are limited by available technology. Examples of hazards which can be detected with DRIs include:

- Certain toxic organic and inorganic vapors and gases;
- Oxygen deficient/enriched atmospheres;
- Flammable or explosive atmospheres;
- Respirable dust and fibers;
- Ionizing radiation;
- Heat stress; and
- Noise level and dose.

Specific information related to the instruments used to detect the above mentioned hazards is presented in Appendices A and B of this SOP. Non-specific DRIs, such as the Flame or Photo Ionization Detectors (FID or PID) and combustible gas monitors will respond positively in the presence of a large number of chemicals. Therefore, these types of instruments are to be used as screening devices only, and are not intended to measure a worker's 8-hour Time-weighted Average (TWA) exposure. Positive readings above the AL for a screening instrument, as defined in the SSHP, will require further investigation to determine the specific chemical(s) that caused the positive response.

7.2 INTEGRATED AIR SAMPLING DEVICES

If the potential for an over exposure exists, integrated personal sampling will be used. This type of sampling will allow for a direct comparison of the worker's exposure to the OSHA PELs, the ACGIH TLVs or other published exposure limits.

Integrated personal air sampling involves the use of either active sampling devices or contaminant specific passive diffusion devices. Active sampling devices use an air sampling pump, a contaminant specific collection media and tubing to connect the pump to the collection media. Passive diffusion sampling devices contain a contaminant specific collection media that passively adsorbs the contaminant. In the event that passive air sampling devices are used, the CESHM will specify the procedure for their use in the SSMP. Active air sampling will be conducted IAW the procedures specified in Section 8.2 of this SOP.

Whenever active sampling collection media require laboratory analysis to determine the quantitative results, the CESHM will select a laboratory that has been approved by the American Industrial Hygiene Association (AIHA) to conduct the analysis. The laboratory selected will be specified in the SSHP.

7.3 SPECIAL AIR SAMPLING DEVICES

Special contaminant or operation specific sampling devices, which do not come under the categories listed above, may be needed on site to sample and assess chemical

hazards. If these devices are required, the CESH will select these devices and outline the procedures for their use in the SSMP.

8.0 PROCEDURES

Priorities for monitoring and sampling chemical and physical hazards on site will be based on the information gathered during the initial site characterization. This information will serve as the basis for selection of appropriate monitoring/sampling equipment and procedures. During site monitoring and sampling activities, the procedures found in this section, and the site specific information outlined in the SSHP/SSMP, will be utilized.

8.1 MONITORING DURING INITIAL SITE ENTRY

Personal protective equipment used during initial site entry will be selected by the CESH and will comply with the provisions of the Personal Protective Equipment Program outlined in the PIKA CESHP. If indicated by site characterization data, or if characterization data is insufficient to make a determination, initial site entry monitoring will be conducted IAW with requirements listed below and any special requirements listed in the SSHP.

- Real-time, DRIs will be used to detect potential IDLH (toxic), explosive/flammable and/or oxygen deficient/enriched atmospheres.
- If the potential for exposure to ionizing radiation exists, monitoring for radiation will be conducted to determine the potential for contact with radioactively contaminated surfaces and to worker's radiation dose.
- The monitoring conducted during initial entry will include, as required, monitoring in the following locations:
  1. Along the perimeter of the site;
  2. In and/or around potential release sources identified during off site reconnaissance;
  3. Around/over standing pools of liquid;
  4. Inside naturally occurring or man-made depressions or structures;
  5. Around storage and disposal containers; and
  6. At locations where dead vegetation or other biological indicators signify the potential for contamination.

Monitoring at the locations listed above will be conducted at the breathing zone height and/or at the point source.

8.2 MONITORING FOR CHEMICAL HAZARDS USING DRIS

When monitoring with DRIs is required, the SSHO, or a trained appointee (TA), will be responsible for conducting the site monitoring IAW the procedures listed in this section

and the provisions outlined in the SSHP/SSMP. Prior to use, each DRI will be inspected by the SSHO/TA to determine if the instrument has been properly maintained/inspected IAW the manufacturer's specifications. Whenever calibration/response standards are available, each DRI will be field calibrated or response checked by the SSHO/TA, using the manufacturer's procedures. Instruments which do not function properly will not be used on site until serviced by the SSHO or the manufacturer. Information related to instrument maintenance and calibration will be maintained by the SSHO in the QA/QC Log. During the use of DRIs, the items listed below will be followed:

- DRIs used on site will be certified by the manufacturer as being safe for the atmosphere in which they will be used.
- When using DRIs to monitor potential contamination in the BZ, the instrument's inlet port will be placed as close to the worker's BZ as possible without interfering with worker's function or safety.
- If work area and/or perimeter monitoring are required, the monitoring locations and heights will be determined by the CESH and will be specified in the SSMP. This determination will be made based upon the physical properties of the contaminant and the site.
- When DRIs are used in highly contaminated sites or in areas where the potential for contact with corrosive chemicals exists, the DRI will be encapsulated in plastic to limit the potential for contamination. If this method of contamination control is used, the inlet port of the DRI will not be covered, thereby allowing the inlet to monitor the ambient air.

8.3 USE OF ACTIVE INTEGRATED SAMPLING DEVICES

When active integrated air sampling is required, the SSHO, or a TA, will be responsible for conducting the sampling IAW the procedures listed in this section and the provisions outlined in the SSHP/SSMP.

8.3.1 Calibration of Sample Pump Flow Rate

The CESH will utilize contaminant specific information from the NIOSH Analytical Guidelines and/or the OSHA Chemical Manual to determine the flow rate to be used during the sampling period. The SSHO or TA will be responsible for ensuring that the sample pump flow rate is set to within 5%, (plus or minus) of the flow rate specified by the CESH. To calibrate the sample pump, the SSHO or TA will follow the steps outlined in Appendix A of this SOP. These steps will also be used to conduct the post-sampling calibration check, which is required to show that the sampling pump functioned properly during the sample period.

8.3.2 Conducting Active Integrated Sampling

In order to obtain the most representative sample of the worker's exposure potential, full shift sampling will be conducted whenever possible and feasible. If full shift sampling cannot be conducted, the SSHO/TA will conduct the sampling during the period of highest exposure potential. Under sampling situations, the SSHO/TA will sample worker(s) assigned to tasks that involve the greatest risk of exposure. This "worst case" sampling strategy minimizes the risk of missing workers who are exposed to levels greater than those measured. During active integrated sampling, the requirements listed below will be followed:

- Air sampling pumps will pre and post-calibrated IAW with Appendix A of this SOP.
- The intake for the sample collection device will be placed in the workers breathing zone, defined as an imaginary hemisphere forward of the shoulders, near the worker's face, with a radius of 6 - 9 inches.
- The SSHO/TA will be responsible for completing the information required in the PIKA Integrated Air Sampling Log and Report Form (Form-533).
- Once the samples have been collected, the SSHO/TA will handle, package and arrange transportation of the samples IAW the procedures and requirements outlined by the CESHM in the SSHP/SSMP.
- Sampling and sample handling will be conducted IAW applicable NIOSH/OSHA/EPA sampling and analytical techniques.
- After the samples that have been collected, sampling equipment used inside a potentially contaminated area will be cleaned prior to leaving the area.

8.4 CONDUCTING SITE AREA/PERIMETER MONITORING

When the potential exists for contaminants to be released during site operations, area/perimeter monitoring and/or sampling will be utilized. The type of area/perimeter monitoring or sampling to be conducted will be specified by the CESHM in the SSMP, with the locations, duration and frequency of each being specified. These specifications may be changed by the SSHO upon approval of the CESHM if weather, or site operations and conditions dictate that a change be made. Whenever possible, DRI area/perimeter monitors will be used when contaminants may be released in quantities great enough to pose an immediate threat to the surrounding population/environment. If DRI monitors are not available, or if the contaminants on site do not pose an immediate threat to the surrounding populace, integrated air sampling may be conducted to verify the effectiveness of the site control boundaries. The type of area/perimeter monitoring to be conducted will be specified by the CESHM in the SSMP, with the location, duration and frequency being dependent upon site operations and conditions.

Real-time, direct reading area/perimeter monitors will be checked periodically to ascertain if they are continuing to work and to determine the peak and average readings. This will occur at a minimum of once every 30 minutes, with the exact frequency determined by the CESHM, and outlined in the SSHP. Area/perimeter samplers/monitors will always be placed downwind from the potential contamination source;

9.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

- The Daily Task and Safety Briefing Log (Form-502);
- The Documentation of Hazard Communication Training Form (Form-505);
- The Daily Safety Training Attendance Log (Form-503); and
- The Daily Inspection and Weekly Audit Report Form (Form-506).

10.0 ATTACHMENTS

Appendix 1: Calibration Procedure for Air Sampling Pumps

APPENDIX 1

CALIBRATION PROCEDURE FOR AIR SAMPLING PUMPS

CALIBRATION PROCEDURE FOR AIR SAMPLING PUMPS

1.0 INTRODUCTION

This procedure is to be used when air sampling pumps must be calibrated to a specific air flow rate. The air flow rate will be specified by the CESHM in the SSHP, and will be derived from the NIOSH or OSHA air sampling methodologies. This procedure applies to low, medium and high volume sampling pumps, used for area, perimeter or personal sampling.

2.0 MATERIALS NEEDED

The following materials and supplies will be needed for the calibration of air sampling pumps:

1. Air sampling pump, and the manufacturer-supplied flow adjustment tool;
2. Collection media (filter cassette, charcoal tube, etc.) required by sampling procedure;
3. 2 pieces of Tygon tubing cut to appropriate length;
4. Primary calibration device, with required supplies, as specified by the manufacturer; and
5. PIKA Personal Air Sampling Data Form.

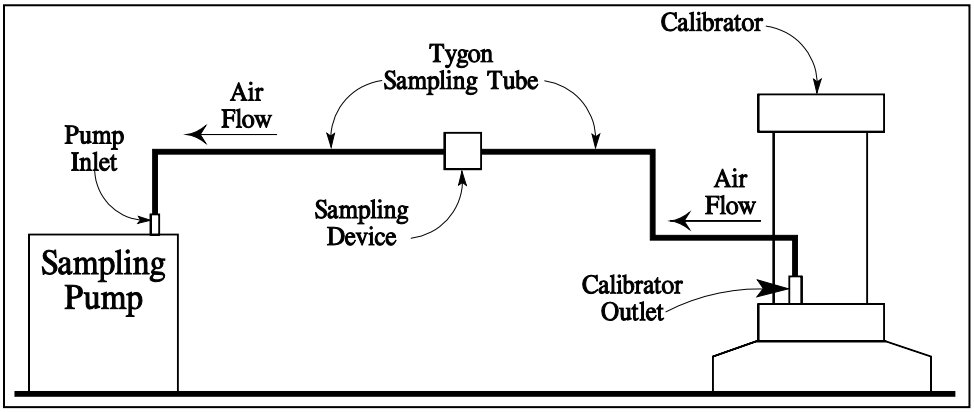
3.0 PROCEDURE

3.1 Set-up and Calibration

When preparing to calibrate an air sampling pump, the pump, collection media, and calibrator will be arranged as follows, unless otherwise specified by the CESHM.

1. Start the pump and allow it to run for approximately five minutes.
2. Set-up pump, sampling device, tubing and calibrator as outlined in Diagram 1, (below), or IAW the calibrator manufacturer's specifications if different from the diagram below.
3. For calibration, use a sampling device similar to the one to be used for the actual sampling. Do not use this sampling device for the actual sampling, but save it to perform the post calibration, which is performed at the end of the sampling period.
4. Using the calibrator and the flow adjustment on the pump, set the pump flow rate to within +/- 5% of the rate specified in the sampling procedure.

Diagram 1



5. Once the pump flow rate is set, take three readings from the calibrator and average the three to obtain the average pre-sampling flow rate. Record this rate on the Personnel Air Sampling Form, along with the pump serial number.
6. The pump may now be turned off and disconnected for the calibrator. Use the same sampling device to calibrate pumps to be used that day for the specified sampling procedure.

3.2 Post-sampling Flow Rate

Once sampling has been concluded for the day, obtain the post-sampling flow rate for each pump. To do this, follow the steps outlined below.

1. Connect the pump to the calibrator as specified in section 3.1 of this procedure.
2. Measure the flow rate three times, calculate the average, and record this information on the sampling form.

1.0 PURPOSE

PIKA recognizes that ensuring project safety requires a coordinated team effort in which each member of the team plays an integral part. While site personnel are tasked with ensuring their safety and the safety of their co-workers, the environment and the public, it is the Site Safety and Health Officer (SSHO) who facilitates the coordinated on-site safety efforts towards maintaining a safe, healthful and compliant work environment. On Project sites with known or potential munitions and explosives of concern (MEC) hazards, an Unexploded Ordnance Safety Officer (UXOSO) will assume the responsibilities of the SSHO (provided minimum client-specific and contractual requirements are met) there-by having the responsibility for occupational and construction safety and health matters throughout the operation. In addition to the coordination of on-site safety, the UXOSO will also be responsible for MEC safety. This Standard Operating Procedure (SOP) outlines the procedures and requirements related to the position of the SSHO or UXOSO. This SOP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual and will be implemented as part of an approved Accident Prevention Plan (APP) associated with each project site. Going forward, the term SSHO refers to those responsibilities held by the SSHO and UXOSO unless specified otherwise. There are instances where UXOSO specific responsibilities will be called our directly.

2.0 SCOPE

2.1 GENERAL APPLICATION

This SOP is applicable to projects where PIKA personnel are assigned the role of the SSHO. This shall include both hazardous and non-hazardous waste sites where a SSHO provides safety oversight. This procedure will be strictly adhered to unless otherwise amended within site-specific project plans. The purpose of this SOP is to supplement the PIKA CESHP and act as a working tool when implementing a site-specific SSHP or APP.

2.2 REFERENCES

The following Alcohol Tobacco and Firearms (ATF), American Conference of Governmental Industrial Hygienist (ACGIH), Department of Defense (DoD), Department of Energy (DOE), National Institute of Safety & Health (NIOSH), National Fire Protection Agency (NFPA), Occupational Safety and Health Administration (OSHA), and U.S. Army Corps of Engineers (USACE), standards apply to this SOP:

1. ATF P 5400.7, ATF-*Explosives Law and Regulations* (most current version);
2. ACGIH Threshold Limit Values (TLVs) and Biological Exposure Indices;
3. Department of Defense (DoD) 6055.9-M, DoD Ammunition and Explosive Safety Standards
4. DoD 4145.26-M, DoD Contractor's Safety Manual for Ammunition and Explosives

5. Department of Defense Explosive Safety Board (DDESB) Technical Paper (TP) 16, Methodologies for Calculating Primary Fragment Characteristics
6. DDESB TP 18, Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel
7. DA-Pam 385-64, Ammunition and Explosives Safety Standards
8. Department of Energy (DOE) requirements in 10 CFR 707, Workplace Substance Abuse Programs at DOE Sites;
9. DOE Requirements of 10 CFR 835, Occupational Radiation Protection;
10. DOE Requirements of 10 CFR 851, Worker Safety and Health Program;
11. DOE G 450.1-1, Implementation Guide for Use With DOE O 450.1, Environmental Protection Program; and
12. DOE G 450.1-2, Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems. NIOSH/OSHA/U. S. Coast Guard (USCG)/Environmental Protection Agency (EPA), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities;
13. NIOSH Pocket Guide to Chemical Hazards, No. 2005-151;
14. NFPA 780, Standards for the Installation of Lightning Protection Systems;
15. OSHA General Industry Standards, 29 CFR 1910;
16. OSHA Construction Standards, 29 CFR 1926; United States Army Corps of Engineers (USACE) Engineering Manual (EM) 385-1-1, Safety and Health Requirements Manual;
17. EM 385-1-97, Explosive Safety and Health Requirements Manual;
18. USACE EM 1110-1-4009, Military Munitions Response Actions;
19. USACE Engineering Pamphlet (EP) 1110-1-18, Ordnance and Explosives Response;
20. USACE Engineering Regulation (ER) 385-1-92, Safety And Occupational Health Requirements For Hazardous, Toxic And Radioactive Waste (HTRW) Activities; and
21. USACE ER 385-1-95, Safety and Health Requirements for Munitions and Explosive of Concern (MEC) Operations.

3.0 RESPONSIBILITIES

3.1 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The PIKA Corporate Environmental Safety and Health Manager (CESHM) is responsible for the continued development and implementation of this SOP and the PIKA CESHP. To effectively implement this SOP, the CESHM will take an active role in providing consultation, guidance, and training to those personnel assigned to the role of SSHO. To this end, the CESHM will:

1. Approve personnel proposed for this role at a PIKA project site.

2. Determine if the personnel assigned to this role meet the requirements specified by PIKA and the client.
3. Determine that the employee has received specific training and possesses the knowledge and experience necessary to implement the SSHP or APP and to verify compliance with applicable safety and health regulations.
4. Provide periodic review and update of this SOP and the CESHP to assess their continued integrity and compliance with applicable Federal, state and local regulations.
5. Consult with each SSHO to determine if site-specific safety and health issues are addressed and resolved.
6. Provide technical assistance and expertise to the SSHO regarding the implementation of the site safety and health related regulations.
7. When needed, assist the SSHO with providing mobilization and safety training.
8. Conduct periodic inspections of project sites to assist the SSHO with the effective implementation of compliance measures and to determine the project compliance with this program, the SSHP and any other project related plans.

3.2 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the project resources needed to implement this SOP. The PM will also verify that this SOP is incorporated into site specific plans, procedures and training.

3.3 SITE SUPERVISOR

The Site Supervisor (SS) will implement this SOP at those sites where an SSHO will be used for on-site management of safety and health issues. For sites with known or potential MEC hazards, a qualified Senior UXO Supervisor (SUXOS) will be assigned as the SS. The SS will work closely with the SSHO to implement feasible controls to reduce the risk of personnel exposure to project hazards, and when possible, to eliminate the potential for an accident. While the SSHO is considered the primary point of contact for safety and health issues, each SS must maintain a positive safety culture that shows personnel that personal and operational safety is paramount to the execution of the task at hand.

3.4 SITE SAFETY AND HEALTH OFFICER OR UNEXPLODED ORDNANCE SAFETY OFFICER

The SSHO has the overall responsibility for facilitating efficiency and productivity through a safe approach to task execution. In this role, the SSHO will evaluate the requirements of the APP/SSHP implemented by site personnel for the duration of site activities. The SSHO will also:

- Verify personnel training records;
- Evaluate personnel performing tasks; and

- Determine that all personnel are properly trained, qualified, equipped, and physically protected from the site and operational hazards to the greatest extent feasible.

During on-site project performance, the SSHO will report administratively to the SS with a functional responsibility to the CESHM. As such, the SS will be responsible for the day-to-day administrative supervision of the SSHO assigned at the site. However, the direct reporting and accountability of the SSHO will lie with the CESHM. The SSHO is to work hand-in-hand with the SS to facilitate a safe, efficient and productive approach to task execution. To effectively implement PIKA's safety and health program, the SSHO will:

1. Implement and enforce the requirements outlined in this SOP;
2. Facilitate a thorough site indoctrination for all site personnel and visitors;
3. Facilitate the effective review of AHAs;
4. Set-up a site safety and health bulletin board;
5. Facilitate the effective development of a Job Safety Analysis (JSA);
6. Initiate and authorize a "Stop Work" order for any imminent S&H concerns;
7. Conduct the safety (including MEC safety for the UXOSO) portion of the daily tailgate briefings;
8. Conduct and document site training (including MEC training for the UXOSO) related to site-specific hazards;
9. Ensure competent/qualified personnel are designated, in writing, with supporting documentation of the related training, qualifications and experience within the site personnel file.
10. Specify proper levels of PPE per the APP/SSHP;
11. Implement and enforce the PIKA Alcohol/Drug Abuse Policy;
12. In conjunction with the SS, investigate and report in a timely manner, all injuries, illnesses, accidents, incidents, or near misses;
13. Conduct visitor orientation, daily safety inspections, and weekly safety audits;
14. Inform the CESHM immediately, when a change in the scope of work or site conditions occurs that affects the tasks addressed in the SSHP or APP;
15. Provide the CESHM with task hazard data for any new tasks or any tasks that significantly change during the conduct of site operations;
16. Ensure no operations are conducted until safety and health provisions required by this SOP and the APP/SSHP are implemented;
17. Assess each task and assess the effective implementation of the safety and health provisions required by this SOP; and
18. Implement the pertinent and requisite requirements of the PIKA CESHP.

4.0 SSHO MOBILIZATION AND SITE SET-UP PROCEDURES

The SSHO will familiarize themself with the PIKA CESHP, the site-specific Work Plan (WP) including the APP/SSHP and the PIKA SOPs. These documents will be used by the SSHO as the basis for identifying the mobilization and training needs of the site. Whenever possible, these documents will be given to the SSHO prior to mobilization to the site. Additionally, when feasible, the SSHO should be a member of the pre-mobilization team, allowing the site mobilization and set-up procedures to take place prior to the arrival of the field team. The mobilization and set-up procedures performed by the SSHO will include:

1. Coordinating with applicable local emergency service/ agencies (i.e. Police, Sheriff, Hospital, Life Flight, Ambulance Service and Fire Department).
2. Determining if FAA or Marine Band notices need to be made, particularly prior to demolition.
3. Surveying the site for hazards and validating the accuracy of the Activity Hazard Analysis forms presented in APP/SSHP.
4. Validating, and if needed modifying, the medical evacuation routes presented in the APP/SSHP and planning the personnel assembly points for emergency evacuations.
5. Inventorying the first aid, equipment, personal protective equipment (PPE), fire extinguishers, etc.
6. Validating the number, type, and location of toilet facilities.
7. Obtaining any local certificates required.
8. Setting up the Health and Safety Bulletin Board IAW EM 385-1-1 01.A.06

If the SSHO is not a member of the pre-mobilization team, or if no pre-mobilization is allowed, the items listed above will be implemented during the first day's operations. If PIKA is acting as a subcontractor, many of the above outlined tasks will already have been completed by the prime contractor prior to the arrival of the PIKA SSHO. However, this does not relieve the SSHO of the responsibility of ensuring that the steps listed above have been accomplished. It is imperative that the SSHO establish a good rapport with applicable local authorities and emergency services to enable and enhance safe, uninterrupted site operations.

5.0 TRAINING REQUIREMENTS AND PROCEDURES

5.1 GENERAL TRAINING REQUIREMENTS

Site training required by the APP/SSHP shall be conducted, or arranged for, by the SSHO or UXOSO. For the mandatory training topics, the SSHO will work with the Site Supervisor to present the data specified in the following paragraphs is presented to affected workers. Unless otherwise specified in this section or the APP/SSHP, training will be documented using the Safety Training Attendance Form-503. At no time will

PIKA personnel be permitted to conduct any site operations involving the potential for exposure to safety or health hazards until they have received appropriate training and reviewed the corresponding AHA.

5.2 SITE-SPECIFIC AND HAZARD INFORMATION TRAINING

Prior to the initiation of site activities involving the potential for exposure to safety or health hazards (including MEC hazards), the SSHO, supported by the SS, will provide Site-specific and Hazard Information Training. The outline in Table 525-1 will be used as general guidance for this training and will cover the topics detailed below in paragraphs 5.2.1 and 5.2.2.

5.2.1 Site-specific Information Training

Site-specific Information Training shall be used to provide site personnel with important information related to site operations. This training shall apply to the three-day on-site training requirements listed in section 5.7 of this SOP, and shall cover site-specific training topics listed below:

1. Site history and background
2. Facility-specific requirements
3. Site organization and chain of command
4. Proper use, maintenance and cleaning of required PPE
5. Emergency response procedures, assignments, and contacts

5.2.2 Hazard-Specific Information Training

Hazard information training shall be presented utilizing the PIKA Hazard Information Program that meets the requirements specified in 29 CFR 1910.120 (i). This training shall inform personnel of the degree, nature, and level of exposure likely to occur as a result of participation in site activities. This training, at a minimum, will cover the following topics:

1. A complete description of physical and toxicological properties of any hazardous materials or chemicals expected.
2. A complete description of the physical hazards associated with site operations, including tasks outlined in the APP/SSHP.
3. A description of the biological hazards, to include identification and protective methods, and what to do if exposure occurs.
4. A description of any MEC hazards and procedures to be used to safeguard personnel.
5. The Work Practices or other hazard control techniques that will be used to minimize exposure.
6. Review and signing of all AHAs; a review of the corresponding AHA will also take place during the "Preparatory Meeting" of each definable feature of work.

5.3 EQUIPMENT TRAINING

Equipment operation training will be conducted for site personnel responsible for the operation of monitoring instruments, earth moving machinery (EMM), power tools, and hand tools. This training will be documented using the Safety Training Attendance Log Form-503 and will include the following:

1. Calibration procedures (if applicable);
2. Safety precautions;
3. Proper startup, operation and shutdown technique; and
4. Care, inspection and maintenance.

TABLE 525-1: SITE-SPECIFIC TRAINING TOPICS

TOPIC	SUB-TOPICS TO BE COVERED
Welcome and Introduction	
Work Plan	A. Safety And Health Chain-Of-Command B. Implications Of The Proposed Work/Project Schedule C. Methods For On- And Off-Site Communications D. Logs & Records
History of Facility	Brief Overview of Facility History
SSHP or APP	A. Site Description B. Site-Specific Hazard Information 1. Chemical Contaminants 2. Physical Hazards 3. Biological Hazards C. Activity Hazard Analysis D. Engineering Controls E. PPE Requirements and Decontamination F. General Safety Precautions G. Prohibited Activities H. Site Access Control I. The Buddy System Procedures J. Safe Equipment Use 1. Mechanical/Hand Tools 2. Heavy Equipment 3. Vehicles K. Contingency and Emergency Response Plan 1. Potential Accidents Associated with Site Operations 2. Emergency Evacuation Routes and Assembly Points 3. Emergency Communications and Reporting Requirements 4. Potential/Actual Fire/Explosion Hazards and Response Procedures 5. Personnel Injury Treatment/Decontamination Procedures 6. Adverse Weather Conditions 7. Chemical Spills (when applicable)
MEC Awareness, Avoidance, Methods, and Procedures	When applicable the UXOSO will provide MEC training to both UXO and non-UXO personnel. Topics covered will be as followed: A. Safety Precautions for Suspected Fuzes and MEC Items On Site B. Vegetation grubbing (if applicable) C. MEC Detection Identifications and Markings 1. General 2. Sweep Lanes 3. Surface/Subsurface Anomaly Detection Techniques E. Surface Investigation and Clearance of UXO/MEC D. UXO/MEC Marking Procedures F. Subsurface Investigation and Clearance of UXO/MEC G. UXO/MEC Disposal and Collection Site H. Safety and Health Issues of UXO/MEC Disposal 1. UXO/MEC Disposal and Collection Site 2. UXO Disposal Procedures (Range Operations) 3. Inert MEC Disposal Procedures

5.4 PERSONAL PROTECTIVE EQUIPMENT TRAINING

As specified by 29 CFR 1910.132 and PIKA SOP-514, Personal Protective Equipment, site personnel required to use PPE shall be given training in the use, care, and limitations of the PPE they are to use. Prior to using the designated PPE, personnel shall demonstrate an understanding of the training and their ability to properly use the assigned PPE. PPE training shall be documented using the Personal Protective Equipment Training Log, Form-530, and will address the following topics:

1. PPE selection decisions;
2. When PPE is needed;
3. What PPE is needed;
4. How to properly don, doff, adjust, and wear PPE;
5. The limitations of specific pieces/types of PPE; and
6. The proper care, maintenance, useful life, and disposal of PPE.

5.5 HAZARD COMMUNICATION TRAINING

In order to comply with the requirements of the OSHA Hazard Communication (HAZCOM) Standard, 29 CFR 1910.1200, training shall be provided to personnel who will use products that contain hazardous substances. This training shall be provided upon initial assignment to the site and prior to use of the product containing the hazardous substance. The SSHO will consult PIKA SOP-509, Hazard Communication, to obtain additional details regarding HAZCOM compliance and training. Supplemental HAZCOM training shall be scheduled and presented whenever a new hazardous substance is introduced into the work area.

5.5.1 General Information Provided

To enhance personnel knowledge of the general requirements of the OSHA HAZCOM standard, the following shall be discussed on site and the site personnel shall be familiarized with the relevant information presented in the following:

1. The basic OSHA HAZCOM Standard (1910.1200) and the PIKA HAZCOM Program SOP-509 (location and basic applicable elements), including employee rights under the regulation;
2. A listing of the operations/processes where hazardous chemicals are used and the potential for exposure exists; and
3. An inventory of the hazardous substances used on site (posted on Safety and Health Bulletin Board), and the location and availability of the associated MSDSs.

5.5.2 Product-specific Information Provided

To enhance personnel knowledge of the chemical and physical hazards associated with hazardous substances used on site, personnel shall be trained to recall, in simple language, the following basic information about each hazardous substance to which they are exposed:

1. Chemical hazards, including the toxic effects a chemical has on the body (long and short term) and the routes of exposure;
2. Physical hazards (i.e., flammability, reactivity);
3. How chemicals may be detected/monitored (instrumentation, color, odor, state);
4. How workers can protect themselves from overexposure or emergency situations (engineering controls, work practices, PPE, and emergency procedures);
5. Steps that have been taken to lessen or prevent exposure to hazardous substances;
6. Spill response procedures for chemical emergencies;
7. Emergency and first aid procedures in the event of overexposure; and
8. How to access and read hazard warning labels and review MSDSs.

5.5.3 Documentation of Hazard Communication Training

HAZCOM training shall be documented by the SSHO using the Documentation of Hazard Communication Training Form-505. This documentation shall be maintained on site for the duration of the project, and later incorporated into the employee's personal training file.

5.6 VISITOR TRAINING

Visitors are defined as persons who are (1) not employed at the project site, (2) who do not routinely enter restricted work areas and, (3) whose presence is of short duration (i.e., 1 to 2 days per visit). Site visitors may include client personnel, PIKA personnel, commercial vendors, political representatives, and auditors or inspectors from federal, state or local regulatory agencies. It is the responsibility of all site personnel to watch for visitors approaching the site and to immediately notify the SSHO, SS or SUXOS of the visitor's arrival. Visitors will be required to comply with the general requirements listed within each project APP/SSHP.

5.7 THREE-DAY ON-SITE FIELD SUPERVISION

All 40hr trained PIKA on-site and subcontractor personnel will receive a minimum of three days of on-site supervised field experience under the direct supervision of a trained, experienced supervisor (24hr HAZWOPER personnel will receive 1 day of Supervised On-site Field Experience). This supervision will be to familiarize site personnel with the site-specific organization, PPE, and emergency response procedures. The on-site supervision is site-specific and will be documented using the Supervised On-site Field Experience Form-511. The UXOSO will complete and maintain this form ensuring that all personnel receive this supervision and acknowledge through signature.

5.8 DAILY AND WEEKLY SAFETY BRIEFINGS

5.8.1 Daily Safety Briefing

It is essential that the SSHO be involved in the Daily Task and Safety Brief given each day prior to commencing work. This briefing must be pertinent and informative, and documented using the Daily Task and Safety Briefing Form-502. The items to be covered include, but are not limited to:

- Expected weather conditions (Heat Stress/Cold Stress, possible storm conditions, etc.);
- Driving conditions/hazards;
- Working conditions
- Required PPE, to include PPE decontamination or PPE hygiene procedures;
- Site-specific hazards (chemical, physical or biological hazards);
- Buddy system procedures;
- Communication (operations and emergencies)
- Emergency notification procedures and evacuation route; and
- Review any safety violations noted the previous day.

5.8.2 Weekly Safety Briefing

During each work week, a 10-15 minute Weekly Safety Briefing (WSB) will be presented to highlight and discuss a site-specific safety or health topic. Site personnel will be required to attend the training and the SSHO or UXOSO will document this training in the Daily Task and Safety Briefing Form-502. The training will be presented by the SSHO, or a designated representative, and will cover topics specified by either the CESHM or a topic relevant to site-specific hazards such as chemicals, ordnance, heat stress, etc.

6.0 LOGS, FORMS, REPORTS AND RECORDS

An essential role of the SSHO is the continued maintenance of logs, reports and records which document the on-site safety and health process and any significant events which may have occurred on site. These logs, records and reports are described below.

6.1 DAILY SAFETY LOG

A daily Safety Log will be maintained by the SSHO. This log will be recorded in a bound book with project title, date, time on each numbered page and will as a minimum include: weather conditions, inspections conducted, results of the inspections, safety issues addressed each day, and any significant occurrences related to site safety. A digital log book providing the above outlined information is also acceptable. Upon project completion, the SSHO will ensure the log is turned over to the corresponding PM for inclusion within site historical files.

The SSHO must understand that the Daily Safety Log is an integral part of ensuring and maintaining the safety and health of on-site personnel. The data contained in the log should be of sufficient detail so as to fully document any incidents that could impact the manner in which operations are conducted or have any type of impact on safety and health policies/procedures used on site. Of special importance is the use of the log to document any guidance or directives given by an on-site client or contractor representatives. The log can also be used to record statements/suggestions made by site personnel. When logging events, it is important to record not only the initial elements of the event, but also the final disposition/outcome of the event. The SSHO should periodically review the log to determine closure for each significant event logged.

6.2 TRAINING LOG

The SSHO is responsible for verifying that the training conducted on site is recorded daily, and that the applicable training forms are properly completed each day that training/briefings are given. Depending upon the number of personnel on site, the SSHO may record the site training in the site Safety Log.

6.3 VISITOR LOG

A visitor record will be maintained at work sites. Visitors to the site must be given a safety briefing and must be logged in and out by the SSHO or SS when they enter/depart the site. Again, depending upon site size and conditions, the Site Visitors Entry and Exit Log, Form-526 may be used to initially record the entry and exit of site visitors. However, details of the visit, to include the purpose of the visit, and the personnel involved, should be recorded in the Safety Log.

6.4 DAILY SAFETY INSPECTIONS AND WEEKLY SITE AUDITS

The SSHO will conduct daily inspections and weekly audits using the Daily/Weekly Safety Inspection and Audit Form-506 and will communicate the results to the SS. The form shall be maintained at the site, and at the conclusion of the weekly audit, a courtesy transmittal shall be forwarded to the CESHM for review. The transmittal may take the form of email and shall outline the following:

- Synopsis of site activities;
- Ongoing safety and health deficiencies/concerns;
- Upcoming site activities;
- Upcoming safety and health concerns.

Additionally, any daily checklist with deficiencies noted will also be forwarded to the CESHM. Once a deficiency has been corrected, the SSHO or UXOSO will notify the CESHM of the resolution. It is imperative that for each deficiency noted, there is documentation (both on the inspection/audit form, Daily Safety Log) of the remedial actions taken to correct the deficiency.

6.5 VEHICLE INSPECTION CHECKLIST

The SSHO will verify that the Vehicle Inspection Checklist and the Equipment Inspection Checklist (Form-507 and Form-508, respectively) are completed on a weekly basis for each site vehicle and heavy equipment used on site. The vehicle inspection checklist will also be used daily for any vehicle used to transport explosives. The checklists will be maintained on-site and categorized by vehicle. If a deficiency is observed on a vehicle/ equipment, additional information regarding the deficiency and the remedial actions taken to correct the deficiency will be added to the checklist. The CESHM and purchasing department will be sent a digital copy of all checklists on a weekly basis or when a remedial action is implemented.

6.6 NEAR MISS REPORTING

PIKA engages it's employees in an effort to identify all near miss related circumstances, affording our personnel an opportunity to assess and correct deficiencies/hazards before they cause personnel injury and/or equipment damage. PIKA values and embraces these types of leading indicators so as to further contribute to the pro-active establishment of a safe and healthful work environment. All near misses will be reported to onsite management and forwarded to the CESHM for further assessment. The reporting of near misses is a great function and should never be used as an avenue for reprimanding our personnel.

6.7 ACCIDENT/ILLNESS

In the event of an emergency, illness, injury, or property accident, the SSHO will be responsible for completing and submitting the Accident/Injury Form-514 when:

1. Any injury or illness requires on-site first aid or assistance at a medical facility;
2. An accident involves property damage;

A digital copy of this form will submitted to the CESHM within 24-hours of the incident occurrence with the original maintained on site. If required by the client's scope of work (SOW), the CESHM will either complete the client's accident forms or forward a copy of the PIKA form to the client's representative. The CESHM will also be responsible for any necessary reporting to Federal or state OSHA offices. For an accident or illness where the individual is treated at a medical facility, copies of the medical evaluation and treatment forms will be included with the accident report when it is forwarded to the CESHM. For property accidents involving site vehicles, a copy of the police report and repair estimates will also be forwarded to the CESHM and the corporate purchasing department with the accident report.

If the project involves a USACE work site, and the injury/illness involves lost time, or property damage in excess of $2,000.00, the USACE Accident Investigation report (Eng Form 3394) will be completed per form instructions. If the Eng 3394 form is required, Form-514 need not be completed. Prior to completion of the Eng Form 3394, verbal

notification will be given to the USACE on-site representative and the CESHM within 24-hours of the incident. A preliminary digital copy of the Eng 3394 form will be forwarded to the CESHM within three working days, with the final version presented to the CESHM within 10 working days. Once the form has been approved, it should be signed by the SS, submitted to the CESHM for signature, and forwarded by the Project Manager to USACE.

6.8 ACTIVITY HAZARD ANALYSIS FORMS

During the performance of site operations, there is always a potential for changes to the anticipated degree or nature of hazards associated with the assigned tasks due to changing (environmental or site) conditions not anticipated during the development of the APP/SSHP. Additionally, a new task could be added, creating hazards not included in previous assessments. If any such condition occurs, the SSHO will immediately notify the CESHM and complete a new Activity Hazard Assessment (AHA), Form-529, outlining the hazards. The CESHM will finalize the AHA and if required, submit it to the client for approval. If client approval is required, the effected task will be halted until approval is obtained. This is especially true for new tasks added to the SOW. At no time should a new task be initiated until it has been evaluated by the CESHM and relevant changes to the APP/SSHP have been integrated and approved.

6.9 EXCLUSION ZONE ENTRY/EXIT LOG

The SSHO will be responsible for tracking access of personnel in and out of an exclusion zone (EZ) on Form -532, the Exclusion Zone Entry and Exit Log. This log is required at hazardous waste sites where an EZ is established to control personnel exposures to both HTRW and UXO hazards and to account for personnel within an EZ in the event of an emergency.

6.10 PERSONAL AIR SAMPLING DATA SHEET

Whenever personal breathing zone or other on-site airborne samples are collected, the SSHO or UXOSO will be responsible for completing the Integrated Air Sampling Log and Report, Form-531. This log is required to record relevant information related to the sampling. Once the sample analysis report has been received, the SSHO will forward a copy of the form and the analysis report to the CESHM (unless the CESHM receives the report directly from the laboratory). The CESHM will then calculate the sample concentration, excursion concentration (if needed) and the 8-hour time-weighted average. The results of this analysis will then be sent to the SSHO who will enter them on the sampling form. A copy of the completed sampling form will then be sent to the CESHM who will review and forward a copy of the form to the Human Resource Department to be included with the employee's medical and exposure records.

6.11 SITE MONITORING LOG

The SSHO, or a designated appointee, will be responsible for ensuring that information related to on-site monitoring will be recorded in the Site Monitoring Log, Form-533 at all sites where real-time and/or direct-reading instruments are used to measure the levels of chemical and physical hazards. This form contains headings and columns for recording some of the most frequently monitored hazards, contact the CESHM for site specific monitoring needs. No matter what the instrument monitoring needs, scheduled calibrations and checks must be conducted, as applicable, before and after each instrument use.

6.12 HEAT STRESS MONITORING LOG

The SSHO will be responsible for ensuring that the Heat Stress Monitoring Log, Form-527 is maintained during all site activities conducted in high heat environments (temperatures exceeding 72 degrees Fahrenheit (° F). This log is required to track the physiological stress experienced by site personnel working in high heat environments.

6.13 SITE-SPECIFIC CHEMICAL INVENTORY

The SSHO will be responsible for ensuring that all chemicals used on site are recorded on the Chemical Inventory Report, Form-528. This log is required under the OSHA Hazard Communication standard (and PIKA's Hazard Communication Program) for all products containing known or potentially hazardous substances used during site activities. The information required to complete this form can be found on the material safety data sheet for each product.

7.0 SAFETY AND PPE REQUIREMENTS

The SSHO will follow the safety and PPE requirements identified to safeguard site personnel. The AHA forms within the APP/SSHP will provide guidance to the SSHO on the proper selection and use of PPE prior to entering a work area or starting a task/operation.

8.0 AUDIT CRITERIA

The following forms will be maintained as proof of compliance with this SOP and will be subject to audit:

- Daily Task and Safety Briefing Log (Form-502);
- Safety Training Attendance Log (Form-503);
- Documentation of hazard Communication Training (Form-505);
- Daily Inspection and Weekly Audit Report (Form-506);
- Vehicle Inspection Checklist (Form-507);
- Equipment Inspection Checklist (Form-508);
- Three-day On-site Training Log (Form-511);
- Accident/Injury/Near Miss Report (Form-514);
- Site Visitors Entry and Exit Log (Form-526);
- Heat Stress Monitoring Log (Form-527);

- Chemical Inventory Report (Form-528);
- Activity Hazard Assessment (Form-529);
- Personal Protective Equipment Training Log (Form-530);
- Integrated Air Sampling Log and Report (Form-531);
- Exclusion Zone Entry and Exit Log (Form-532);
- Site Monitoring Log (Form-533); and
- USACE Accident Investigation report (ENG Form 3394).

9.0 ATTACHMENTS

No attachments are associated with this SOP.

1.0 PURPOSE

PIKA recognizes that the development of an effective safety culture requires a coordinated team effort in which each member of the team plays an integral part. All PIKA personnel are tasked with ensuring their safety and the safety of their co-workers, the environment and the public. Therefore, this Standard Operating Procedure (SOP) will be used in conjunction with the PIKA Corporate Environmental, Safety and Health Program (CESHP) to help provide safety and health orientation to new PIKA employees or new/promoted supervisors. The goal of this program is to improve employee safety and health knowledge and to promote PIKA's safety and health culture.

2.0 SCOPE

2.1 GENERAL APPLICATION

This SOP is applicable to all PIKA projects where PIKA personnel may be exposed to occupational safety and health hazards. This shall include hazardous waste sites, demolition sites, construction sites and any other project sites associated with PIKA contracts. All newly hired field or supervisory personnel will be given the Phases I and II of the General Orientation training as outlined in paragraph 5.0 of this SOP. Orientation required for newly hired or promoted supervisors is presented in Paragraph 6.0 of this SOP.

2.2 SPECIALIZED APPLICATIONS

For those project sites where specialized hazards may be encountered such as munitions and explosives of concern (MEC) or radiological hazards, the employees will be provided with specialized orientation training according to the Site Safety and Health Plan (SSHP) written for the site. This training will be documented at the project site and will be documented using the PIKA Safety Training Attendance Log Form-503. This form will be maintained at the site and become a part of the permanent project records.

3.0 REFERENCES

The Occupational Safety and Health Administration (OSHA) standards listed below apply to the conduct of operations associated with this SOP. Additionally, the responsibilities of the SSHO as outlined in this SOP are also designed to meet U.S. Army Corps of Engineers (USACE), Department of Energy (DOE), and other current client requirements.

- OSHA General Industry Standards [especially OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard 29 CFR 1910.120];
- OSHA 29 CFR 1926 Construction Standards (notably 29 CFR 1926.65);
- Client specific safety and health manuals, directives, standards, and/or regulations.

4.0 RESPONSIBILITIES

4.1 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The PIKA Corporate Safety and Health Manager (CESHM) is responsible for the continued development and implementation of this SOP and the PIKA CESHP. To effectively implement this SOP, the CESHM will:

1. Provide periodic review and update of this program and the CESHP to assess the continued integrity and compliance of the CESHP with applicable Federal, state and local regulations.
2. Consult with PIKA project and site management personnel to assess the effectiveness of this program.
3. Provide consultation to newly hired or promoted supervisors, to include periodic discussions to assess and guide their safety attitude and behavior.
4. Conduct periodic inspections of project sites to evaluate the documentation and effectiveness of new employee knowledge of PIKA CESHP requirements.
5. During site visits, conduct interviews with newly hired employees or newly promoted supervisors to evaluate their safety and health values and provide guidance as needed.

4.2 PROJECT MANAGER

The Project Manager (PM) shall be responsible for the availability of the project resources needed to implement this SOP, and will verify that this SOP is utilized for all new personnel assigned to projects for which the PM has responsibility. This shall include both newly hired field personnel and supervisors that are either newly hired or promoted.

4.3 SITE SUPERVISOR

The Site Supervisor (SS) is the primary point of contact at each PIKA site that has the overall responsibility for the safe conduct of site operations. As such, the SS will implement this SOP for new employees before they are allowed to participate in site operations unsupervised. New field personnel must complete Phase I of the orientation as defined in this SOP prior to being allowed to participate in Phase II of the orientation. During the Phase II, the SS will:

1. Supervise the new employee at all times;
2. Assist the new employee in the use of all personal protective equipment (PPE) required by the SSHP or other site safety plan;
3. Provide any additional training that the employee might need to safely perform the assigned tasks;
4. Obtain documentation of successful completion for any training the employee may have had previously and determine if any updates or refresher courses are required; and
5. Evaluate the use of all feasible controls to reduce the risk of personnel exposure to project hazards.

The SS will implement the requirements of paragraph 6.0 of this SOP for newly hired or recently promoted supervisors. At no time will a newly hired or promoted supervisor be allowed to start work at a PIKA site without an experienced supervisor having conducted the orientation outlined in paragraph 6.0.

4.4 SITE SAFETY AND HEALTH OFFICER

The SSHO is the safety and health authority on the site and is intended to assist the SS in the implementation of safety and health requirements and the oversight of S&H procedures. In this role, the SSHO will verify that the requirements of this SOP are implemented for all new employees to determine that all personnel are properly trained, qualified, equipped, and physically protected from site and operational hazards to the greatest extent feasible. To affect this, the SSHO will assist the SS with employee orientation by:

1. Briefing all new employees on the PIKA safety and health program mission, values, and policies;
2. Documenting the Phase I and II orientation training;
3. Specifying the proper levels of PPE IAW the requirements of this SSHP for the Phase II orientation;
4. Implementing the safety and health provisions required by this SOP and the SSHP prior to employee performance of site tasks.

5.0 GENERAL ORIENTATION

5.1 PHASE I

5.1.1 Baseline knowledge

Under contract to multiple Federal, state and commercial clients, PIKA conducts a large variety of operations involving many different tasks-related hazards. This includes the performance of work involving Uncontrolled Hazardous Waste sites. Therefore, PIKA requires all of its site personnel to provide documentation of having completing the OSHA required 40-Hour HAZWOPER course. This requirement also has the benefit of making sure all PIKA personnel have a baseline safety orientation and background knowledge of the topics taught in the 40-hour HAZWOPER course, to include:

1. PPE use, limitations and maintenance;
2. Basic hazard assessment and control measures;
3. General contamination control and decontamination procedures;
4. Medical surveillance requirements;
5. The types and effects of chemical exposure;
6. Identification and control of physical hazards such as heat/cold stress and noise;
7. Identification and control of biological hazards; and
8. Employee Hazard Communication (HAZCOM) Right-to-Know regulations.

5.1.2 Review of the Project Safety Plan

As a matter of corporate policy presented in the PIKA CSHM, PIKA requires the development of an Accident Prevention Plan (APP). Prior to being allowed to participate in site activities where an exposure to safety or health hazards exists, new field personnel and supervisors will read the project APP. As required in the plans, the employees will sign the appropriate plan review form indicating that they have read and understand the safety and health provisions and requirements outlined in the plan.

5.1.3 Required Site and Task Hazard Training

Regardless of the plan required, Site-specific and Hazard Information Training will be specified in each plan based upon the tasks anticipated and the hazards associated with the site and the tasks. All new employees will be provided this training and all site training required by the project plans shall be conducted, or arranged for, by the SS or SSHO. Unless otherwise specified in this section or the SSHP, all training will be documented using the PIKA Safety Training Attendance Log Form-503 and the PIKA New Employee Safety Orientation Checklist Form-534. At no time will new PIKA personnel be permitted to conduct any site operations involving the potential for exposure to safety or health hazards until they have received appropriate training.

5.1.3.1 Site-specific Information Training

Site-specific Information Training shall be used to provide site personnel with important information related to site operations. This training shall apply to the Three-day On-site Training outlined below in paragraph 3.1.3.3, and shall cover the topics listed below:

1. PIKA's Corporate safety and health mission statement, values, policies, and roles/responsibilities
2. Site history and background
3. Site organization and chain of command
4. Emergency response procedures, assignments, and contacts
5. Site or facility-specific requirements

5.1.3.2 Hazard-Specific Information Training

Hazard information training shall be presented utilizing the PIKA Hazard Information Program that meets the requirements specified in 29 CFR 1910.120 (i). This training shall be presented to all personnel involved in site operations and shall be used to inform personnel as to the degree, nature, and level of exposure likely to occur as a result of participation in site activities. This training, as a minimum, will cover the following topics:

1. A description of physical and toxicological properties of any chemical hazards expected to be found on site.
2. A description of the physical hazards associated with site operations.
3. A description of the biological hazards which may be encountered on site.
4. A description of any specialized hazards that may be encountered (i.e., MEC, radiological contaminants, chemical warfare material, etc.) and the safety procedures to be used for the safety of on-site personnel.

5. The safe work practices, engineering controls, or other hazard control techniques that will be used to minimize exposure to chemical, biological or physical hazards.
6. A review of the Activity Hazards Analysis developed for each task.
7. The use, limitations, cleaning, and maintenance of the PPE that will be required to reduce the risk and degree of physical or chemical exposure.

5.2 PHASE II – ADDITIONAL TRAINING AND ON-SITE ORIENTATION

5.2.1 Additional training

Each project safety plan will outline the task-specific training required for specific job titles and assignments. Additionally, Chapter 6 of the PIKA CSHM contains PIKA's Training Program. These resources will be used by the SS and SSHO to help provide for the requisite training employees will need for task-specific operations as outlined and defined in the above referenced documents. Examples of additional training required include: Equipment operation training will be conducted for site personnel who will be responsible for the operation of monitoring instruments, earth moving machinery (EMM), power tools or hand tools. This training will be documented using the Safety Training Attendance Log Form-503 and will include the following:

1. Heavy Equipment Operations;
2. Hazard Communication for hazardous substance use;
3. Confined Space Entry;
4. Hearing Conservation;
5. Control of hazardous energy (Lockout/Tagout);
6. Crane operations and material rigging; and
7. Fall Protection.

5.2.2 Three-day On-site Supervised Field Experience

As part of the new employee's orientation to a HAZWOPER site, the SS and SSHO will conduct and document the OSHA required Three-day On-site Supervised Field Experience as outlined in the OSHA HAZWOPER Standard. Part of this training is covered during the site-specific and hazard information training. This experience involves the SSHO and the SS instructing the new employee on the site-specific procedures related to the safety and health chain of command, PPE donning/doffing, safe work practices, decontamination, emergency notification and response, and evacuation routes. Once site personnel have been given this instruction and been supervised on site for three days, the SSHO will verify that personnel have signed the PIKA Three-day Supervised On-site Field Experience Form-511.

6.0 NEWLY HIRED OR PROMOTED SUPERVISOR ORIENTATION

6.1 BASELINE TRAINING REQUIREMENT

Again, based upon the nature of PIKA's operations and the need to perform HAZWOPER activities, PIKA requires that all project supervisors

(as well as all personnel in a management or supervisory position) have attended and completed not only the 40-Hour HAZWOPER course, but also the HAZWOPER 8-Hour Management and Supervisor Training. As such, all PIKA supervisory personnel obtain the general safety and health knowledge required for daily field operations, but also the programmatic issues required by OSHA in 1910.120(e)(4) or 1926.65(e)(4). This includes as a minimum the following requirements:

1. The Safety and Health Program;
2. Employee training and toolbox meetings;
3. Personal protective equipment;
4. Emergency response, fire protection and spill containment;
5. Health hazard monitoring procedures and techniques;
6. New worker orientation procedures.

6.2 ADDITIONAL SUPERVISOR ORIENTATION

Newly hired or promoted supervisors are required to meet additional orientation and training requirements. This includes a thorough review of the PIKA CESHP with all of its attached SOPs and all client required standards, directives, and regulations. Included in this additional orientation are the following topics:

1. PIKA's Safe, Accident-free Environment (SAFE) program;
2. Behavior Based Safety procedures;
3. Safe work practices;
4. Daily and weekly safety briefings and meetings;
5. Emergency and first aid procedures;
6. Accident investigation;
7. Fire prevention, protection and response procedures; and
8. New Worker Orientation Program.

6.3 SUPERVISOR MENTORING PROGRAM

All newly hired or promoted supervisors should possess the requisite knowledge and experience needed to safeguard site personnel from the hazards associated with the project to which they are assigned. As such, it is the policy of PIKA to assign a mentor to newly hired or promoted supervisors. The mentor assigned to a newly hired or promoted supervisor will be a senior site supervisor or project manager who will perform the supervisory duties while the new supervisor becomes oriented to and accustomed to the supervisory tasks to which they have been assigned. The duration of this mentorship will vary depending upon the knowledge and experience of the newly hired or promoted supervisor, but will not be less than one full work week. At no time will a new supervisor be assigned to a project without an experienced PIKA mentor being assigned to assist in the supervisor's orientation. When possible and feasible, the mentor will work on-site with the newly hired or promoted supervisor.

7.0 SAFETY AND PPE REQUIREMENTS

The SS and SSHO will verify that new employees are wearing the appropriate PPE whenever they are engaged in orientation or training associated with the implementation of this SOP. The SSHO will utilize associated safety and health plans to assess and assign the PPE for personnel involved with on-site orientation.

8.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

1. The Daily Operational and Safety Logs;
2. The Safety Training Attendance Log (Form-503 for the initial site hazard training;
3. The PIKA New Employee Safety Orientation Checklist form (Form-534);
4. The PIKA Three-day Supervised Training From (Form-511); and
5. The Daily Safety Inspection and Weekly Safety Audit Checklists (Form-506).

9.0 ATTACHMENTS

None.

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to outline PIKA's drug and alcohol abuse policy. This ESHP will be used in conjunction with the PIKA Corporate Environmental Safety and Health Program (CESHP) Manual, and will be implemented as part of an approved Accident Prevention Plan (APP).

2.0 SCOPE

This SOP applies to all PIKA personnel, including subcontractor personnel, and operations at any site where PIKA personnel work. As such, this procedure addresses prohibited activities, drug testing scenarios, and employment eligibility in regards to alcohol/drug abuse.

3.0 REFERENCES

The following reference document was used in the development of this SOP.

- Controlled Substances Act, U.S.C 811, 812.

4.0 DEFINITIONS

As used in this SOP, the following terms apply:

Illegal Drug – An illegal drug is any controlled substance, as specified in Schedules I through V of the Controlled Substances Act, U.S.C 811, 812. The term "illegal drugs" does not apply to a controlled substance that is used in accordance with (IAW) the terms of a valid prescription, or other uses authorized by law.

Installation Property - Means project site owned equipment or vehicles used for government business.

Medical Review Officer (MRO) - A licensed physician who is responsible for receiving laboratory results generated as a result of testing conducted under the requirements of either this ESHP or any site-specific substance abuse procedure. The MRO shall be knowledgeable of information related to illegal drug use and other substance abuse disorders and shall be trained to evaluate an individual's positive test result.

Misuse or Abuse of Alcohol - Means performing a work related function while (1) having an blood alcohol concentration at or above 0.04, (2) consuming alcohol within two hours of a scheduled work period or during any work period, or (3) being otherwise impaired by alcohol.

Occurrence - Means any occurrence or incident that is a deviation from the planned or expected behavior or course of events in connection with any operation if the deviation has environmental, public safety and health, or national security significance. Incidents having such significance include the following or incidents of similar nature:

- A work place accident that results in property damage, an injury to any person that requires medical treatment, or a fatality.
- Involvement of nuclear, flammable or explosive materials that results in an explosion, fire, the spread of radioactive material, personal injury or death, or significant damage to property.
- Accidental release of pollutants that results or could result in a significant effect on the public or environment.
- Accidental release of radioactive material above regulatory limits.

Substance Abuse - Means the misuse of alcohol, prescription medication, or the use of illegal drugs.

5.0 RESPONSIBILITIES

5.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this ESHP is incorporated into site specific plans, procedures and training.

5.2 CORPORATE ENVIRONMENTAL SAFETY AND HEALTH MANAGER

The Corporate Safety and Health Manager (CESHM) is responsible for the continued development, improvement, and implementation of the PIKA Corporate CESHP, to include this SOP. To accomplish this end, the CESHM will be responsible for the following:

1. Conducting an annual review of this ESHP and making modifications as necessary.
2. Conducting periodic audits of PIKA projects to ensure compliance with this SOP.
3. Scheduling random drug testing and assisting the SS and SSHO in the scheduling of testing conducted as a result of this ESHP.
4. Providing the Site Safety and Health Officer (SSHO) with consultation related to visitor entry and protective measures.

5.3 SITE SUPERVISOR

The Site Supervisor (SS) will ensure that this SOP is implemented for all PIKA operations. The SS will also ensure that relevant sections of this SOP are discussed in the daily safety briefings and that information related to its daily implementation is properly recorded in appropriate site documentation.

The SS will also be responsible for notifying the PM and CESHM if there is suspicion that an employee is using illegal drugs or is appearing a work under the influence of alcohol.

5.4 SITE SAFETY AND HEALTH OFFICER

The Site Safety and Health Officer (SSHO) will be responsible for ensuring this SOP is enforced on a daily basis by conducting inspections of site operations to observe site personnel.

6.0 PROCEDURES AND PROHIBITED ACTIVITIES

The procedures and prohibited activities discussed in this paragraph are the minimum procedures and prohibited activities that shall be implemented during all PIKA projects. These procedures and prohibited activities may be augmented by project-specific requirements if so mandated by the client and required by the project contract.

6.1 GENERAL REQUIREMENTS

Any employee harboring, possessing, using, or selling alcoholic beverages or illegal drugs while on company property shall be required to leave such property and the SS will immediately notify the PIKA Project Manager and CESHM. While on duty, employees shall not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances.

6.2 DRUG TESTING

An independent laboratory will perform substance abuse testing. Testing may be done using urine, hair or blood samples or a breath test. Testing is performed to ensure safe Company operations. PIKA shall conduct drug testing as noted under the following circumstances:

- **Pre-Employment Testing -** All persons who are offered employment to work at a project site facility shall pass a pre-employment drug-screening test prior to beginning actual work.
- **Random testing** - All project personnel will be subject to random testing where required by the client. Upon notification by the CESHM or their designee, employees shall report to a designated clinic to participate in random drug testing. Office staff or employees who do not visit job sites are exempt from random testing but not the other conditions listed here.
- **Testing as a Result of Occurrence** - In the event of a job related occurrence, PIKA shall arrange for a post incident drug test and possible alcohol test as soon as possible, but not more than 24 hours from the time of the occurrence. Employees directly involved with the incident will be tested to determine if such individuals could have caused or contributed to the conditions which caused the occurrence.
- **Testing on the Basis of Suspicion** - In the event that two or more supervisory or management officials, at least one of whom is in the direct chain

of supervision of the employee, agree that such testing is appropriate the contractor's safety representative shall be contacted to coordinate arrangements for drug and/or alcohol testing.

- **Observation of Drugs or Alcohol on the Premises** – Drug testing shall be required in the event that alcohol or illegal drugs are discovered either on the project site or in an employee's possession.

6.3 POSITIVE TEST RESULTS

In the event that a drug/alcohol screen or test results in a positive result, a confirmation test will be performed by the gas chromatography/mass spectrometry method. All test results and medical history shall be reviewed by the MRO who will make a final determination of a positive drug test. If initial test results for alcohol show an alcohol concentration of 0.04 or above, a confirmatory test will be performed following an interval of 15 minutes. The confirmatory test shall be considered the final result for purposes of any subsequent action, including discipline. All confirmed positive tests for drugs or alcohol shall be reported by the MRO. Any disciplinary action taken as a result of a positive drug/alcohol test, up to and including termination, will be determined by the President of PIKA.

6.4 REHABILITATION

Drug addiction is an illness. Drug abuse is a potential threat to employee health, safety and security. Employees needing assistance in dealing with these problems are encouraged to contact supervisory personnel, doctors or other medical professionals for guidance and treatment. Conscientious efforts to seek help will not jeopardize an employee's job. However, drug dependency or abuse is not an acceptable excuse for poor performance or safety and/or work violations. A list of employee assistance programs, drug counselors, rehabilitation centers, etc. is available from the Human Resource Department.

Employees who successfully complete any rehabilitation program will be subject to the same random drug testing as all other employees. Failure to pass a drug test after completion of a rehabilitation program will lead to disciplinary action up to and including termination of employment.

6.5 PRESCRIPTION/OVER-THE-COUNTER DRUGS

The use of medically prescribed or over-the-counter medications, pursuant to the direction of a licensed physician for current use (within the past 12 months), is permissible as long as the medication or drug does not adversely affect work ability, job performance, or employee/client safety. Employees taking a drug with a potentially significant impact on their job performance must inform their Immediate Supervisor before starting or resuming work. The Company reserves the right to limit or suspend an employee's work activity during the period in which job performance may be affected.

6.6 SEARCHES

During the scope and course of the employee's employment, the Company reserves the right to conduct searches or inspections to monitor compliance with rules concerning PIKA drug, alcohol and/or inhalant use. This policy extends to work areas, desks, cabinets, lockers, storage areas, Company vehicles, vehicles on property and other personal items (i.e., purses, briefcases, backpacks, etc.). Searches of the person shall include the emptying of pockets and the production of other items concealed in clothing. A member of site or project management will conduct all searches. The Company has the right to search regardless of whether the employee places a private lock on the property.

These searches may be conducted randomly or if there is reasonable cause to suspect a violation of PIKA rules with regard to security, drug, alcohol and/or inhalant use and the possession of weapons. Any item found during a search believed to be an illegal drug or drug paraphernalia, alcohol or weapon will be confiscated, and the individual will be given a written receipt listing the items or substances seized. The employee will be given the opportunity to explain anything found during the search as established by execution of this form.

All searches will be conducted with the authorization of the employee. Personal privacy will be considered to the maximum extent practicable in the administration of these search provisions. A search of a person or personal area should not be construed as an accusation of wrongdoing, but only as compliance with PIKA policy. Any action deemed necessary as a result of a search will be decided upon by the President of PIKA or his designated representative.

6.6.1 Drug Convictions

Any employee convicted of violating a criminal drug or alcohol statute will report in writing the facts surrounding the conviction and sentence to the President or his designated representative within five calendar days of the conviction. The President of PIKA, or his designated representative, will determine the type and extent of any necessary actions.

7.0 AUDIT CRITERIA

The following items related to site compliance with this SOP will be maintained in site records and subject to audit:

1. The Daily Operational and Safety Logs;
2. The Safety Meeting Attendance Log for the initial site hazard training;
3. The Safety Meeting Attendance Log for the Daily Safety Briefing; and
4. The Daily Safety Inspection Checklist.

8.0 ATTACHMENTS

No attachments are associated with this SOP.

ATTACHMENT 4

PIKA ES&H FORMS

WEEKLY SAFETY AND HEALTH REPORT

FOR THE WEEK ENDING:

Project Name:

Project Location:

Reported By:

General Site Operations/Tasks Performed This Week:

-
-
-
-
-

Specialized Site Operations (select)

-
-
-
-
-

Specialized Site Operations (select)

-
-
-
-
-

Specialized Training Conducted:

-
-
-

Misc. Operational or Personnel Issues:

-
-
-
-

PIKA INTERNATIONAL, INC.

WEEKLY SAFETY AND HEALTH DISCUSSION CHECKLIST Form-501

GENERAL SITE INFORMATION			
Contract No.:	Date:	Time:	Log No.:
Project Name and Location:			
Site Supervisor:	SSHO:		

Item	Discussion Issues				
1	What are the tasks to be conducted this week?				Level of PPE
2	Heavy equipment to be used during the week's operations (Provide all relevant information listed below)				
	Manufacturer	Type	Model Number	Special Attachments	
3	Expected weather conditions for the week (List for applicable days):				
	Monday:				
	Tuesday:				
	Wednesday:				
	Thursday:				
	Friday:				
	Saturday:				
	Sunday:				
4	Number of personnel on the site - _____. New personnel mobilizing to the site this week. _____. Are any personnel demobilizing from the site? If so, please list: _____.				

	The following are relevant to activities for this week (Discuss 'Yes' items in the comment section below):	Yes	No
5	Special physical, chemical, or biological hazards may be associated with the tasks being conducted.	☐	☐
6	Changes to PPE are needed from that specified in SSHP.	☐	☐
7	Additional PPE items or safety and health supplies will be needed this week.	☐	☐
8	Deficiencies have been noted in equipment or vehicles (attach inspection/audit forms).	☐	☐
9	Injuries, accidents or near misses that occurred last week on this or other sites (list in comments).	☐	☐
10	Decontamination procedures for personnel or equipment are required and established.	☐	☐
11	Training or medical surveillance will be required for site personnel.	☐	☐
12	Site monitoring or sampling will be needed for airborne or physical hazards to be conducted this week.	☐	☐
13	There have been specific safety or health concerns, comments, or questions from the client in the last week.	☐	☐

	Compliance Issues (Discuss 'No' items in the comment section below)	Yes	No	NA
14	Proper communications are available on site and properly functioning	☐	☐	☐
15	Proper decontamination control is established and adequate	☐	☐	☐
16	All explosive operations and storage issues are being performed IAW project plans	☐	☐	☐
17	Are all personnel adequately trained to perform specific task functions and certifications are on site	☐	☐	☐
18	All assigned levels of PPE are adequate for the tasks being performed	☐	☐	☐
19	Site control is being maintained in accordance with the site plans	☐	☐	☐
20	Flammable storage locations are established and approved fire protection is provided.	☐	☐	☐
21	Adequate first aid and emergency response supplies are on site and properly maintained.	☐	☐	☐
22	Emergency services are available and hospital routes have been checked recently.	☐	☐	☐

Comments (include the item number for each comment):

Corporate Safety Review Comments:

Signatures (Maintain As Part of Site Files; Submit to CESHM as requested)

SSHO Signature _____ Site Supervisor Signature _____

Corporate Reviewer (Printed) _____ (Signature) _____ Date: _____

PIKA INTERNATIONAL, INC.

DAILY TASK AND SAFETY BRIEFING LOG Form-502

I. GENERAL PROJECT AND SITE INFORMATION

Date:	Instructor(s):	Time:	Log No.:
Site Name & Location:			
Contract No.:		Contract No.:	
Site Manager or SUXOS:		SSHO:	

II. SAFETY AND HEALTH TOPICS COVERED

Tasks Being Conducted:

Applicable AHA's Reviewed for Today's Tasks:

Anticipated Weather Conditions for the Day:

Safety Concerns:

Permits Required: ☐ Safe Work Permit ☐ Excavation Permit ☐ Penetration Permit ☐ Other:

☐ Hot Work Permit ☐ Lift Permit ☐ Lockout / Tagout ☐ Permits Are On Site

Heavy Equipment to be Used Today:

Site Control and Buddy Procedures:

Subcontractors Working On-site Today and Their Tasks:

Emergency Procedures:

Assembly Locations:

Scheduled Deliveries for Today:

III. DAILY SAFETY BRIEFING ATTENDEES

Name (printed)	Signature	Organization

I certify that the personnel listed on this roster have received the safety and health training described above.

Site Safety and Health Officer

Sr. UXO Supervisor or Site Supervisor

PIKA INTERNATIONAL, INC.

PIKA SAFETY TRAINING ATTENDANCE LOG Form-503

Date:	Instructor(s):	Time:	Log No.:
Site Name & Location:			
Contract No.:		Task Order Number:	
Site Supervisor or SUXOS:		SSHO:	

I. TRAINING PROVIDED

☐ Initial Site Hazard Training ☐ Weekly Safety Training ☐ Other:

☐ Task/Hazard-specific Training (list task/hazard):

II. TRAINING TOPICS COVERED

Description of the S&H Topics Covered:

1.
2.
3.
4.
5.
6.
7.
8.

III. TRAINING COURSE ATTENDEES

Name (printed)	Signature	Organization

IV. TRAINING VERIFICATION

I certify that the personnel listed on this roster have received the safety and health training described above.

Site Safety and Health Officer

Sr. UXO Supervisor or Site Supervisor

PIKA INTERNATIONAL, INC.

SAFETY OBSERVER FORM Form-504

Assigned Safety Observer:	Date:
PIKA Project #:	Report #:
Site Name and Location:	
Description of Work Performed:	
Slips, Trips, Falls:	
Struck By/Against:	
Strains/Sprains:	
Fire/Explosion:	
Burns, Chemical/Heat:	
Exposure to Contaminants:	
Unsafe Acts Observed:	
Unsafe Conditions Observed:	
Safe Behavior Observed to be Recognized:	
Other/Comments:	
Signature of Safety Observer: _____ Safety Observer Reviewed By (Supervisor): _____	

PIKA INTERNATIONAL, INC.

Form-505

DOCUMENTATION OF HAZARD COMMUNICATION TRAINING FORM

I. SITE INFORMATION

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

II. HAZARDOUS SUBSTANCES/PRODUCTS AND MSDS's REVIEWED

Initial	Hazardous Substance/Product	Initial	Hazardous Substance/Product

III. TRAINING ELEMENTS COVERED

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

IV. TRAINING COURSE ATTENDEES

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

Name (printed)	Signature	Company/Organization

PIKA INTERNATIONAL, INC.

DAILY INSPECTION AND WEEKLY AUDIT REPORT Form-506

GENERAL SITE INFORMATION			
CONTRACT NO.:	**DATE:**	**TIME:**	**LOG NO.:**
SITE NAME AND LOCATION:			
SITE SUPERVISOR:	**SSHO:**		
WEATHER CONDITIONS:			
AREAS INSPECTED: (List by location, team, or task):			

INSPECTION RESULTS

Item Description	Pass	Item Description	Pass
1. Personal Protective Equipment (PPE) per SSHP		9. MEC Detection Equipment Use/Calibration	
2. Work Practices Follow SSHP/WP		10. Monitoring/Sampling Equip. Calibration/Use	
3. Site Control established per SSHP		11. Heavy Equipment Insp./Maintenance/Use	
4. First Aid Kit(s)/Eyewash Station(s)		12. Hand and Power Tool Insp./Maintenance/Use	
5. Fire Extinguisher(s)		13. Site House Keeping & Sanitation	
6. Flammable Storage Areas		14. Explosives / MEC / Other Storage Areas	
7. MSDSs and Container Labeling per SSHP		15. Other: (list)	
8. On- and Off-Site Communications		16. Other: (list)	

SUMMARY OF DEFICIENCIES NOTED: (If Required)

CORRECTIVE ACTIONS RECOMMENDED: (If required)

RE-INSPECTION RESULTS: (If required)

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

_____	_____
Site Safety and Health Officer	Site Supervisor / Project Manager

Note: Safety Inspections are to be conducted each day and documented on this form. This form will also be used to document the Weekly Safety Audit conducted at the end of each workweek. The weekly audit will not only indicate the present status of the site operations, but will also be used to note the current status of deficiencies noted during daily inspections.

PIKA INTERNATIONAL, INC.

VEHICLE INSPECTION REPORT Form-507

Site Name / Location:		
Site Supervisor:	**Vehicle:** _____ (MAKE AND LICENSE PLATE #)	
Date Inspected:	**Mileage:**	**Owner:** _____ (RENTAL, PIKA, GFE, CONTRACT)

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

ITEM DESCRIPTION	PASS Y	N	NA	ITEM DESCRIPTION	PASS Y	N	NA
1. DOCUMENTATION:				**5. BRAKES:**			
Registration and License Plate	☐	☐	☐	Hand/Emergency	☐	☐	☐
Insurance	☐	☐	☐	Service	☐	☐	☐
Emergency Route Map & Phone #s	☐	☐	☐				
2. TIRES:				**6. BELTS:**			
Pressure	☐	☐	☐	Proper tension	☐	☐	☐
Condition	☐	☐	☐	Condition	☐	☐	☐
3. EQUIPMENT:				**7. GENERAL:**			
Fire extinguishers	☐	☐	☐	Windshield	☐	☐	☐
First Aid/CPR/Burn Kits	☐	☐	☐	Windshield Wipers	☐	☐	☐
Bloodborne Pathogen Kit	☐	☐	☐	Windows (Condition/Operation)	☐	☐	☐
Eyewash Kits	☐	☐	☐	Seat Belts	☐	☐	☐
Spare Tire	☐	☐	☐	Steering	☐	☐	☐
Tire Changing Equipment	☐	☐	☐	Horn	☐	☐	☐
Tie downs ✳	☐	☐	☐	Gas Cap	☐	☐	☐
Chocks ✳	☐	☐	☐	Mirrors	☐	☐	☐
Placards ✳	☐	☐	☐	Door/Window Handles/Latches	☐	☐	☐
Other (list):	☐	☐	☐	Cleanliness	☐	☐	☐
Other (list):	☐	☐	☐	Exhaust System ✳	☐	☐	☐

ITEM DESCRIPTION	PASS			ITEM DESCRIPTION	PASS		
4. FLUID LEVELS:				**8. LIGHTS:**			
Oil	☐	☐	☐	Headlights (high & low)	☐	☐	☐
Coolant	☐	☐	☐	Brake Lights	☐	☐	☐
Brake	☐	☐	☐	Parking	☐	☐	☐
Steering	☐	☐	☐	Back-up	☐	☐	☐
Transmission	☐	☐	☐	Turn Signals	☐	☐	☐
Windshield Wiper	☐	☐	☐	Emergency Flashers	☐	☐	☐
Fluid Leaks	☐	☐	☐	Interior Lights	☐	☐	☐
Last Oil Change							

Notes: 1. **Items marked with an ∗ are required for explosive carriers and must be inspected prior to each use.**

2. **All forms with failures are to have the deficiencies noted and copy of form forwarded within two working days to the PIKA PM and the Corporate Safety and Health Manager.**

Description of Deficiencies:
Corrective Actions to be Taken:

Inspection Conducted By _____ _____
Name Printed Signature

Deficiencies Corrected By _____ _____ Date:
Name Printed Signature

PIKA INTERNATIONAL, INC.

EQUIPMENT INSPECTION REPORT Form-508

Site Name & Location:					
Contract No.:			**Task Order Number:**		
Site Supervisor or SUXOS:			**SSHO:**		
Log #:	**Date:**	**Time:**	**Odometer Reading:**	**Hour Meter Reading:**	**Fuel Level:**
Make/Description:			**Model:**	**Serial No.:**	

Mark the "Pass" column to indicate that the item is present and in proper working condition. If required but absent or deficient check "Fail" and describe the deficiency and the required corrective action in the "Discrepancy/Comments" box. If an item does not apply to the equipment being inspected, enter "NA". All listed items must have a response.

Item	Pass/Fail/NA	Deficiency and Required Corrective Action
Service Brakes		
Emergency Brakes		
Parking Brake		
Brake Lights		
Back-up Alarms		
Horn		
Tires		
Spare Tire & Tire Changing Equip.		
Steering		
Seat Belt		
Operating Control		
Fire Extinguisher		
Head and Tail Lights		
Mirrors		

Windshield		
Windshield Wipers and Washers		
Coupling Devices		
Guards for Moving Parts		
Brake – Hydraulic		
Brake Fluid		
Hydraulic Oil		
Engine Oil and Coolant		
Roll Over Protection System		
Falling Object Protection System		
Other:		
Other:		
Other:		

Inspection Conducted By	Name Printed	Signature	
Deficiencies Corrected By	Name Printed	Signature	Date:

Note: Forms with deficiencies are to be faxed to the PM and the Safety/Health Manager within two working days of inspection.

PIKA INTERNATIONAL, INC.

SAFETY AND HEALTH VIOLATION REPORT Form-509

GENERAL SITE/EMPLOYEE INFORMATION			
Site Name and Location:			
Employee Name:		SSN:	D.O.B.:
Site Supervisor:		Site Safety and Health Officer:	
Date of Incident	Approx. Time of Incident:	Date of Report:	
Employee Job Title:		Task Being Conducted:	
PPE Being Worn at Time of Incident:			

DESCRIPTION/NATURE OF THE INCIDENT

Description of Incident (Use additional paper if needed):

Investigation Conducted By:

RESULTS OF INCIDENT INVESTIGATION

The reported incident (☐ was/☐ was not) a documented violation of safety or health policy, procedure or regulation.

Relevant Notes Related to the Incident:

Type of Violation: ☐ Minor Violation ☐ Major Violation ☐ 1st Violation ☐ 2nd

(Check all that apply)

Violation Involved: ☐ Fed Regulations ☐ PIKA CESHP ☐ PIKA ESHP ☐ S$

Result of Incident: ☐ Near Miss ☐ Property Damage ☐ Personal Injury ☐ Vehicle/Equipment Damage

(Check all that apply ☐ Lost Work Time ☐ Limitation of Duties ☐ Other (If box checked, explain in detail)

Had Employee Received Training/Briefings Related to the Requirements Listed Above

Required Medical Testing: ☐ Breath Alcohol Testing: (Time/Date _____/_____) Results: ☐ (+) ☐ (-)

☐ Drug Screen: (Time/Date _____/_____) Results: ☐ (+) ☐ (-)

Status at Time of Report: ☐ Returned to Work with Verbal Warning ☐ Returned to Work with Written Warning ☐ Suspended Pending Review ☐ Other: _____
Corrective Measures to be Implemented:
SIGNATURES
Employee Signature: Date::
SSHO Signature: Date:
Corrective Actions Completed By (Printed Name): _____ (Signature): _____ Date:
PIKA Corp. S&H Review By (Printed Name): _____ (Signature): _____ Date:

PIKA INTERNATIONAL, INC.

SITE SAFETY AND HEALTH PLAN ACKNOWLEDGEMENT Form-510

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

EMPLOYEE STATEMENT

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

Project Name/Location:			
Date:	Organization	Printed Name	Signature

PIKA INTERNATIONAL, INC.

THREE-DAY SUPERVISED ON-SITE FIELD EXPERIENCE Form-511

Site Name & Location:	
Contract No.:	**Task Order Number:**
Site Manager or SUXOS:	**SSHO:**

The site personnel listed below have received Site Hazard Information Training as specified in 29 CFR 1910.120(i) and have participated in three-days of supervised on-site field experience as required by 29 CFR 1910.120(e)(3)(i). The Site Hazard Information Training included information related to the nature, level, and degree of exposure likely to result during participation in site operations. The 3-Day on-site field experience has included: a description of the site chain-of-command; use/care/maintenance of PPE; personnel and equipment decon procedures; safe work practices; medical/training requirements; and emergency response procedures.

Name (printed)	Signature	Organization	Date Supervision Started	Date Supervision Completed

PIKA INTERNATIONAL, INC.

ACTIVITY HAZARD ANALYSIS ACKNOWLEDGMENT Form-512

Project Name & Location:	Briefing Conducted By:
Project Phase:	**Activity Discussed:**
Site Supervisor / SUXOS:	**SSHO:**

Acknowledgement of Understanding

My signature below indicates that I have been briefed on the above Activity Hazard Analysis (AHA) Form for the above referenced activity conducted as part of the referenced project phase. My signature also indicates that I understand the hazards associated with the task and the hazard control requirements specified in the AHA form, and will comply with and adhere to the requirements specified in this briefing.

Date	Name (print)	Signature	Company

PIKA INTERNATIONAL, INC.

INCIDENT/ ACCIDENT REPORT FORM Form-514

SECTION 1 - GENERAL SITE AND PERSONNEL INFORMATION			
Employee Name:	Date of Hire:		Case No.:
Job Title:	D.O.B.:	Sex:	Age:
Project Name and Location:			
Site Supervisor	Site Safety and Health Officer		
Accident Investigator:	Date of Incident:	Time of Incident:	

SECTION 2 - CONDITIONS AT TIME OF INCIDENT

Temperature: _____°F Relative Humidity: _____**%** Degree of Cloud Cover: _____**%**

Wind Speed: _____MPH Direction: _____ Other Relevant Weather Conditions: _____

Type of Incident: ☐ Personal Injury ☐ Personal Illness ☐ Chemical Exposure

☐ Motor Vehicle ☐ Heavy Equipment ☐ Property Damage ☐ Near Miss

If chemical exposure, what material(s) was (were) involved: _____

What was the nature of exposure (contact, inhalation, etc.): _____

PPE Worn by Employee:

SECTION 3 - PERSONAL INJURY/ILLNESS INFORMATION

Brief Description of the Injury/Illness (i.e., laceration, strain, etc.):

Body Part(s) Affected: Primary: _____ Secondary: _____

Injury/Illness Required: ☐ On Site First Aid Treatment ☐ Visit to Occupational Physician

☐ Emergency Room Treatment ☐ Hospitalization

Injury/Illness Resulted In: ☐ Loss of Work Time ☐ Restriction / Limitation of Duties ☐ Fatality

☐ Other: (Explain): _____

Status at Time of Report: ☐ Returned to Work: (Date: _____)

☐ Hospitalized: (Anticipated Stay:_____)

☐ Convalescing: (Anticipated Length of Convalescence:_____)

☐ Other: _____

On-site First Aid Treatment Given (use additional paper if needed):

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

Name and address of primary health care provider (e.g., physician, nurse, etc.):

SECTION 4 - MOTOR VEHICLE/HEAVY EQUIPMENT ACCIDENT INFORMATION

Type of Vehicle/Equipment	Type of Collision	Seat Belt Use
☐ Car/Van ☐ Van/Truck ☐ Heavy Equip. ☐ Other:	☐ Side Swipe ☐ Rear End ☐ Backing ☐ Head On ☐ Broadside ☐ Roll	Front Seat ☐ Yes ☐ No Back Seat ☐ Yes ☐ No

Describe the nature of the damage.

Property/Material/Items Involved

Name of Item	Owner	$ Amount of Damage
		$
		$
		$
		$
		$

SECTION 5 - INCIDENT REVIEW AND INVESTIGATION

Date PIKA CESHM and PM were notified Verbally, By Whom? _____

Written, By Whom?

Were operations conducted using an approved PIKA ESHP or SSHP?

☐ Yes Reference:

☐ No Explain:

Activity in progress at time of accident. (Be specific.)

Events (Describe the accident sequentially, beginning with initiating events.)

Name any objects or substances involved and tell how they were involved. (e.g., utility knife, chemical container)

Accident Causes

a. Conditions

b. Actions

c. Factors influencing a or b.

SSHO's Comments (use additional paper if needed):

Employee Comments (use additional paper if needed):

Corrective Actions Taken (use additional paper if needed):

Witnesses

Name	Organization	Phone Number

SECTION 6 - SIGNATURES	
Employee Signature: _____	Date: _____
SSHO Signature: _____	Date: _____
Site Supervisor Signature: _____	Date: _____
Investigation Completed By: _____	Date: _____
Corrective Actions Completed By: _____	Date: _____
PIKA Corp. Review By: _____	Date: _____

PIKA INTERNATIONAL, INC.

POST BBP EXPOSURE EVALUATION AND FOLLOW-UP Form-520

I. Post-Exposure Information

A. Exposed Employee _____

B. Social Security No. _____

C. Location of Incident _____

D. Task/procedure involved _____

E. Date/Time of Incident _____

F. Was employee utilizing Personal Protective Equipment (PPE)? ☐ Yes ☐ No

If yes, check PPE being used at time of exposure:

- ☐ Gloves - Type _____
- ☐ Apron
- ☐ Mask
- ☐ Eye protection - Type _____
- ☐ Other

G. Part of body exposed _____

H. Supervisor's name _____

I. Description of Incident:

_____

_____

_____

_____

J. Source Individual: _____

☐ Known

☐ Unknown - Proceed as if source is known **positive**

II Post-Exposure for HIV

A. Consent/Refusal/Test Results of Source:

Name of Source: _____

☐ I hereby give consent for serological testing for HIV infection.

☐ I hereby refuse to give consent for serological testing for HIV infection.

☐ Source Unknown/Refuses Testing - Proceed as if **Positive**

Source Individual: _____ Date: _____

Signature

Serologic Test Result: ☐ Positive - Inform employee, test for HIV antibodies.

☐ Negative - Determine Risk of Source Individual

B. Risk of Source Individual:

☐ High Risk Activities (proceed as if **positive** result)

☐ Low Risk Activities (provide HIV testing if requested)

C. Consent/Refusal/Test Results of Exposed Employee:

☐ I hereby give consent to serological testing for HIV infection.

☐ I hereby refuse to give consent for serological testing for HIV infection.

Exposed Employee: _____ Date: _____

Signature

Test Results: ☐ Positive - Counsel employee per state/local laws

☐ Negative - Counsel employee, advise of need to retest.

Serologic Retest Results: 6 weeks: Date _____ ☐ Positive ☐ Negative

12 weeks: Date _____ ☐ Positive ☐ Negative

6 months: Date _____ ☐ Positive ☐ Negative

III. Post-Exposure for HBV

A. Consent/Refusal/Test Results of Source:

Name of Source: _____

☐ I hereby give consent for serological testing for HBV infection.

☐ I hereby refuse to give consent for serological testing for HBV infection

☐ Source Unknown/Refuses Testing - Proceed as if **Positive**

Exposed Employee: _____ Date: _____

Signature

Test Result: ☐ Positive - Continue with Section III B.

☐ Negative - No further action needed.

B. Test Exposed Employee for HBV infection.

Name of Exposed Employee _____

☐ I hereby give consent for serological testing for HBV infection.

☐ I hereby refuse to give consent for serological testing for HBV infection.

Source Individual: _____ Date: _____

Signature

Test Results: ☐ Negative - Consult as to the need for vaccination.

☐ Positive - Continue to Section III C.

C. Exposed Employee's Vaccination Status and Post-exposure Procedures

Unvaccinated Employee

☐ Offer HBIG and HB vaccine

Vaccinated Employee - Test for anti-HBs

☐ If adequate - No treatment

☐ If inadequate - Offer HB vaccine booster

IV. Comments

Completed by (name printed): _____

Completed by (signature): _____ Date: _____

PIKA INTERNATIONAL, INC.

HEPATITIS B VACCINE DECLINATION FORM-521

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Declining Employee's Name (printed) _____

Declining

Employee's Signature: _____ Date:_____

Witnessing Employee's Name (printed): _____

Witnessing

Employee's Signature: _____ Date:_____

PIKA INTERNATIONAL, INC.

SITE VISITORS ENTRY AND EXIT LOG FORM-526

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

PIKA INTERNATIONAL, INC.

SITE VISITORS ENTRY AND EXIT LOG FORM-526

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

PIKA INTERNATIONAL, INC.

CHEMICAL INVENTORY REPORT Form-528

Site Name/Location:			Contract No.:		Delivery Order No.:
Date	Product Name	Supplier's Name and Address	Hazardous Substances in the Product	Training Given	MSDS On-site

PIKA INTERNATIONAL, INC.

ACTIVITY HAZARD ANALYSIS Form-529

Project:

Job:

Prepared By: Reviewed By:

Date Prepared (MM-DD-YYYY):

Risk Assessment Code (RAC):

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Severity	**Catastrophic**	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Recommended Protective Clothing

Job Steps	Hazards	Actions to eliminate or minimize hazards	RAC

Job Steps	Hazards	Actions to eliminate or minimize hazards	RAC

Equipment To Be Used	Inspections Required	Training Required

Certification Of Activity Hazard Analysis

The signature below certifies that the above mentioned persons have assessed and reviewed this task to ascertain the potential hazards associated with its conduct, and to determine the control techniques and PPE which will be required to safeguard site personnel from the identified hazards.

Signature of Analyst:	Date:	Signature of Reviewer:	Date:

PIKA INTERNATIONAL, INC.

PERSONAL PROTECTIVE EQUIPMENT TRAINING Form-530

Name: Last First MI	Employee No:	Date of Hire:

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

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

PIKA INTERNATIONAL, INC.

EXCLUSION ZONE ENTRY AND EXIT LOG FORM-532

PROJECT NAME: PROJECT LOCATION:					CONTRACT NO.:		
Date	Name	Company	Reason for EZ Entry	Safety Briefing Given By	Time		PIKA Escort Req'd (Y / N)
					In	Out	

PIKA INTERNATIONAL, INC. **EMPLOYEE SAFETY ORIENTATION TRAINING CHECKLIST Form-534**

Site Name & Location:	
Contract No.:	Task Order Number:
Employee Name:	
Site Supervisor or SUXOS:	SSHO:
Date Orientation Started:	Date Orientation Completed:
During employee orientation the following items will be discussed and reviewed with the employee prior to the employee working on site. Each item will be initialed by the person conducting or supervising the review or discussion. If a given topic is not applicable to the employee's duties, write "NA" in the space and initial the "NA."	

Initial	Training Topic
	General safety and health policies and procedures and pertinent provisions of any client specific safety and health documents.
	Requirements outlined in the site-specific APP and SSHP.
	Procedures for the PIKA Safety Observer Program.
	Requirements for the daily Task and Safety Briefings and Weekly Safety Meetings.
	Requirements and responsibilities for accident prevention and maintaining safe and healthful work environments.
	Employee and supervisor responsibilities for reporting all accidents.
	Provisions for medical facilities and emergency response, including emergency evacuation procedures, evacuation routes and assembly points.
	The location of emergency phone numbers, and medical facilities/treatment procedures.
	Procedures for reporting and correcting unsafe conditions or practices.
	Job hazards and the means to control/eliminate those hazards, including applicable AHA Forms and PPE requirements.
	Safe use of PPE including hand, eye, head, hearing, and respiratory protective devices applicable to the job.
	Use of site fire extinguishers with practical application (e.g. dry run of PASS)
	Requirements for the use of fall protection and ladder use and safety.
	Site-Specific ladder training
	Procedures regarding "Stop Work" authority.
	Applicable provisions of the hazard communication program and location of MSDSs.
	Identified confined spaces and their general entry requirements and restrictions.
	Procedures for immediately reporting all accidents to include injuries or property damage to the SSHO.
	Fire prevention and protection, to include the location of fire extinguishers and fire reporting procedures.
	Location of the job trailer, office trailer, vehicle parking areas, and designated smoking areas.
	Location of project bulletin board.
	Rules prohibiting the use or possession of intoxicants, drugs, guns, weapons, ammo on the job site.
	Rules prohibiting horseplay and other unsafe behavior.
	Good house keeping requirements for the job site and break areas.
	Local traffic regulations, permits, and speed limits.
	Safe clearance distances, use of safety vest, and safe procedures for working around heavy equipment.
	"Buddy" procedures and the need for looking out for others.
	Identification/control of toxic substances related to either on-site contamination or products used on-site.
	Requirement to maintain safety awareness at all times and to be responsible for your safety and the safety of those working around you.

	General Lockout/Tagout (LO/TO) procedures including identification of LO/TO devices.
	Employee requirement to notify the SSHO of any known medical problems or conditions that could affect their safety or which need to be known in the event of an emergency. , to include use of medications
	Employee requirement to notify the SSHO of medications being used that could affect employee's safety.

NOTES: _____

_____

_____

Employee Signature: _____ Date: _____

Supervisor's Signature: _____ Date: _____

PIKA INTERNATIONAL, INC.

SAFETY AND OCCUPATIONAL HEALTH DEFICIENCY TRACKING LOG Form-535

Section and Item #	Date Deficiency Identified	Description of Deficiency or Comment	Recommended Action	Person Responsible for Correcting Deficiency	Projected Resolution Date	Date Deficiency Actually Resolved

JOB SAFETY ANALYSIS (JSA) Form-536

Job/Task: _____ Date: _____
Work Location: _____
Employee(s): _____

☐ New
☐ Revised

In case of an incident, the following people will be contacted:
Supervisor:_____
Safety:_____
Other:

- What is the most hazardous part of this job and what are you going to do to control the hazard?
- Are you properly trained to complete these tasks?
- What do you need to ensure this job is completed incident and injury free?
- What conditions, job changes or distractions could prevent this job from being incident and injury free?

Sequence of Job Steps	Potential Hazard(s)	Recommended Action/Procedure

Additional Personal Protective Equipment Req'd	☐ face shield ☐chemical goggles ☐chemical protective clothing ☐rubber boots ☐chemical resistant gloves ☐leather gloves ☐cut resistant gloves ☐respiratory protection _____ ☐ arm protection ☐hearing protection ☐fall protection ☐Other _____
Required Permits/Safe Work Plans	☐General SWP ☐Hot Work Permit ☐Confined Space Entry ☐Excavation and Trenching ☐Lift Plan/Crane Ops ☐Work in proximity to Overhead Conductors
Gas Detection Equipment Needed	☐H_2S monitor ☐LEL, O_2, H_2S, CO Monitor ☐Other _____
List hazardous substances MSDS reviewed? ☐yes ☐n/a	

Examine each step carefully to find and identify hazards or potential dangers that could lead to injury, illness or damage. Consider the following:

Chemical Hazard:
- Inhalation
- Skin Contact
- Absorption
- Injection
- Ingestion

Biological Hazards:
- Bloodborne Pathogens
- Mold
- Valley Fever
- Plant/Insect/Animal

Physical Hazards:
- Electrical
- Fire/Explosion
- Noise
- Radiation
- Thermal Stress
- Pinch Point/Line of Fire
- Slips/Falls
- Strike against/Struck by

Ergonomic Hazards:
- Repetition
- Forceful exertion
- Awkward Posture
- Contact Stress
- Vibration
- Work Area Design

Site Control	☐barricades ☐post signs ☐caution tape ☐designated area for vehicles ☐heavy equipment spotter ☐establish meet and greet process		
Environmental Conditions	Weather:	Terrain:	Wildlife:
Hazardous Energy Control	☐LO/TO checklist complete ☐LO/TO devices in place ☐energy isolation verified		
Tools and Equipment	☐pre-use inspection complete ☐trained in use of tool/equipment List tools/equipment being used:_____		

Work Site Diagram – Include equipment set-up, evacuation route, assembly area and identified hazards

JSA Review

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

ATTACHMENT 5

PIKA EMPLOYEE HEALTH AND SAFETY QUALIFICATIONS

Certificate of Completion

This certifies that

Margaret Carte

Has Successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA and EPA Regulations As Well

This course is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) issued by Safety Unlimited, Inc. (Accreditation # 044)

Julius P. Griggs	150423581676	4/23/2015
Julius P. Griggs Instructor #892	Certificate Number	Issue Date

SAFETY UNLIMITED, Inc.
OSHA Compliant Safety Training Since 1993

2139 Tapo St., Suite 228 Simi Valley, CA 93063
888 309-SAFE (7233) or 805 306-8027 866-869-7097 (fax)
www.safetyunlimited.com

Proof of initial certification and subsequent refresher training is NOT required to take refresher training
Want to be sure this certificate is valid? Visit safetyunlimited.com/verification

ETI ETC

Certifies that

MARGARET A. CARTE

Dated: September 6, 2011

Successfully completed 40 hours of training in

HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

29 CFR 1910.120 (E)

Kenneth Ames, Ph.D., P.G., Q.G.W.C.
(800) 481-0321

ETI/ETC, A Division of SADG, Inc.
3213 W. Wheeler, Ste. 7
Seattle, WA 98199

Naval School
Explosive Ordnance Disposal

Certificate of Completion

Presented to

A1C Cameron M. Wenzel

For having successfully completed the prescribed course of study for
EXPLOSIVE ORDNANCE DISPOSAL
Surface (CIN A-431-0012)
on this 16th day of June 1999.

CAPT J. E. FRASER, USN
Commanding Officer

Certificate of Completion

This certifies that

Cameron Wenzel

Has Successfully completed

8 Hour HAZWOPER Refresher Training

Refresher certification does NOT necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance w/Federal OSHA Regulation 29 CFR 1910.120(e) & (p)

And all State OSHA and EPA Regulations As Well

This course is approved for 8 Contact Hours (0.8 CEUs) of continuing education per the California Department of Public Health for Registered Environmental Health Specialist (REHS) issued by Safety Unlimited, Inc. (Accreditation # 044)

Julius P. Griggs	15020455526	2/4/2015
Julius P. Griggs Instructor #892	Certificate Number	Issue Date

SAFETY UNLIMITED, Inc.
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www.safetyunlimited.com

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Want to be sure this certificate is valid? Visit safetyunlimited.com/verification

THE NATIONAL ENVIRONMENTAL TRAINERS

certify that

Cameron Wenzel

has satisfactorily passed an exam and completed a 40 hour training course entitled

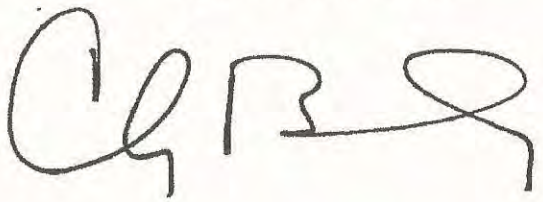
"Hazardous Waste Operations and Emergency Response"

meeting the requirements identified in Title 29 CFR 1910.120. This course is eligible for 3.33 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

NATIONAL ENVIRONMENTAL TRAINERS

April 16, 2004

Signature of Instructor



Clay Bednarz, MS, CHMM (No. 3482)

ATTACHMENT 6

PIKA MEDICAL SURVEILLANCE CLEARANCE DOCUMENTATION

WorkCare
MAKING HEALTH COUNT

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: PIKA - Annual Field Exam (Non-Rad)
EXAM CLASSIFICATION: Periodic Examination

EMPLOYEE:	**Carte, Margaret**	**COMPANY:**	**PIKA International, Inc.**
ID:		**POSITION:**	**Geologist**
DATE OF EXAM:	**04/21/2015**	**LOCATION:**	**PIKA-Sacramento**
EXPIRATION DATE:	**04/21/2016**	**SITE:**	

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	☒	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	☒	☐

STATUS

☒ **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

☐ **NOT QUALIFIED**

☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS:

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 04/28/15

Signature: Peter P Greaney MD

WorkCare
MAKING HEALTH COUNT

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: PIKA - Annual Field Exam (Non-Rad) **UPDATE**
EXAM CLASSIFICATION: Periodic Examination

EMPLOYEE:	**Wenzel, Cameron**	**COMPANY:**	**PIKA International, Inc.**
ID:	**018126**	**POSITION:**	**UXO Tech**
DATE OF EXAM:	**06/02/2014**	**LOCATION:**	**PIKA-Ft. Stewart**
EXPIRATION DATE:	**06/02/2016**	**SITE:**	

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120 (Hazwoper)?	☐	☒	☐
Has the employee any limitations in accordance with 29 CFR §1910.134 (Respirator)?	☐	☒	☐
Examination in accordance with OSHA 1910.120, 1926.1101 (Asbestos Certification). Employee has been informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.	☒	☐	☐

STATUS

☒ **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

☐ **NOT QUALIFIED**

☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS:

Qualified for biennial frequency.

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Dennis W Stephens, M.D. Date: 06/11/14

Signature: 

ATTACHMENT 7

PIKA CORPORATE STATEMENT OF SAFETY AND HEALTH POLICY

ENVIRONMENTAL, SAFETY AND HEALTH POLICY STATEMENT

The fundamental safety and health policy of PIKA International, Inc. (PIKA) is to provide PIKA employees with a safe and healthful working environment that is free of recognized safety and health hazards. Paramount to the implementation of this policy is PIKA's core safety belief that accidents are preventable and that environmental, safety and health (ES&H) values should not be compromised to promote other issues such as production rate or cost.

Additionally, it is PIKA's policy to plan and implement each project to minimize environmental impacts and effectively incorporate pollution prevention into each phase of the project. PIKA will comply with relevant U.S. Environmental Protection Agency (EPA) laws and regulations and implement applicable sections of the Code of Federal Regulation Part(s) 1910 (Occupational Safety and Health Standards) & 1926 (Safety and Health Regulations for Construction) and the United States Army Corps of Engineers guidelines [Engineering Manual (EM) 385-1-1 and EM 385-1-97]. PIKA is committed to the systematic evaluation, planning and integration of personnel safety, public health and environmental protection regulations.

ATTACHMENT 8

RARE SPECIES THAT NEST OR RESIDE AT THE CAMP RAVENNA JOINT MILITARY TRAINING CENTER

Attachment 8 - Rare Species that Nest or Reside at the CRJMTC

Group	Common Name	Scientific Name	State Status
Amphibian	Eastern box turtle	*Terrapene Carolina*	SC
Amphibian	Four-toed Salamander	*Hemidactylium scutatum*	SC
Bird	American bittern	*Botaurus lentiginosus*	E
Bird	American Black Duck	Anas rubripes	SI
Bird	Barn owl	*Tyto alba*	T
Bird	Blackburnian warbler	*Dendroica fusca*	SI
Bird	Black-throated blue warbler	*Dendroica caerulescens*	SI
Bird	Bobolink	*Dolichonyx oryzivorus*	SC
Bird	Brown creeper	*Certhia americana*	SI
Bird	Canada warbler	*Wilsonia canadensis*	SI
Bird	Cerulean warbler	*Dendroica cerulea*	SC
Bird	Common moorhen	*Gallinula chloropus*	SC
Bird	Dark-eyed junco	*Junco hyemalis*	SI
Bird	Gadwall	*Anas strepera*	SI
Bird	Golden-crowned kinglet	*Regulus satrapa*	SI
Bird	Golden-winged warbler	*Vermivora chrysoptera*	X
Bird	Great egret	*Ardea alba*	SC
Bird	Green-winged teal	*Anas crecca*	SI
Bird	Henslow's sparrow	*Ammodramus henslowii*	SC
Bird	Hermit thrush	*Catharus guttatus*	SI
Bird	Least bittern	*Ixobrychus exilis*	T
Bird	Least flycatcher	*Empidonax minimus*	SI
Bird	Magnolia warbler	*Dendroica magnolia*	SI
Bird	Marsh wren	*Cistothorus palustris*	SC
Bird	Mourning warbler	*Oporornis philadelphia*	SI
Bird	Northern bobwhite	*Colinus virginianus*	SC
Bird	Northern harrier	*Circus cyaneus*	E
Bird	Northern shoveler	*Anas clypeata*	SI
Bird	Northern waterthrush	*Seiurus noveboracensis*	SI
Bird	Pine siskit	*Carduelis pinus*	SI
Bird	Prothonotary warbler	*Protonotaria citrea*	SC
Bird	Purple finch	*Carpodacus purpureus*	SI
Bird	Red-breasted nuthatch	*Sitta canadensis*	SI
Bird	Redhead duck	*Aythya americana*	SI
Bird	Ruddy duck	*Oxyura jamaicensis*	SI
Bird	Sandhill crane	*Grus canadensis*	SE
Bird	Sedge wren	*Cistothorus platensis*	SC
Bird	Sharp-shinned hawk	*Accipiter striatus*	SC
Bird	Sora rail	*Porzana carolina*	SC

Attachment 8 - Rare Species that Nest or Reside at the CRJMTC

Group	Common Name	Scientific Name	State Status
Bird	Trumpeter swan	*Cygnus buccinator*	ST
Bird	Virginia rail	*Rallus limicola*	SC
Bird	Wilson's Snipe	*Gallinago delicata*	SI
Bird	Winter wren	*Troglodytes troglodytes*	SI
Bird	Yellow-bellied sapsucker	*Sphyrapicus varius*	SC
Fish	Eastern sand darter	*Ammocrypta pellucida*	SC
Fish	Mountain brook lamprey	*Ichthyomyzon greeleyi*	E
Insect	Brush-tipped emerald	*Somatochlora walshii*	E
Insect	Caddisfly	*Psilotreta indecisa*	T
Insect	Graceful underwing	*Catocala gracilis*	E
Insect	Mayfly	*Stenonema ithica*	SC
Insect	Moth	*Apamea mixta*	SC
Insect	Moth	*Brachylomia algens*	SC
Insect	Scurfy quaker	*Homorthodes furfurata*	SC
Insect	Subflava sedge borer	*Capsula subflava*	SI
Mammal	Big brown bat	*Eptesicus fuscus*	SC
Mammal	Black Bear	*Ursus americanus*	E
Mammal	Bobcat	*Felis rufus*	T
Mammal	Deer mouse	*Peromyscus maniculatus*	SC
Mammal	Eastern red bat	*Lasiurus borealis*	SC
Mammal	Hoary bat	*Lasiurus cinereus*	SC
Mammal	Little brown bat	*Myotis lucifugus*	SC
Mammal	Northern long-eared bat	*Myotis septentrionalis*	SC
Mammal	Pygmy shrew	*Sorex hovi*	SC
Mammal	Southern Bog Lemming	*Svnaptomys cooperi*	SC
Mammal	Star-nosed mole	*Condylura cristata*	SC
Mammal	Tri-colored bat	*Perimyotis subflavus*	SC
Mammal	Woodland jumping mouse	*Napaeozapus insignis*	SC
Mussel	Creek heelsplitter	*Lasmigona compressa*	SC
Plant (Bryophyte)	Lurking leskea	*Plagiothecium latebricola*	T
Plant (Bryophyte)	Narrow-necked Pohl's Moss	*Pohlia elongata var. elongata*	E
Plant (Bryophyte)	Tufted moisture-loving Moss	*Philonotis fontana var. caespitosa*	E
Plant (Vascular)	Appalachian quillwort	*Isoetes engelmannii*	E
Plant (Vascular)	Arbor vitae	*Thuja occidentalis*	P
Plant (Vascular)	False hop sedge	*Carex lupuliformis*	P
Plant (Vascular)	Greenwhite sedge	*Carex albolutescens*	P
Plant (Vascular)	Handsome sedge	*Carex formosa*	E
Plant (Vascular)	Hobblebush	*Viburnum alnifolium*	T

Attachment 8 - Rare Species that Nest or Reside at the CRJMTC

Group	Common Name	Scientific Name	State Status
Plant (Vascular)	Long beech fern	*Phegopteris connectilis*	P
Plant (Vascular)	Pale sedge	*Carex pallescens*	P
Plant (Vascular)	Philadelphia panic-grass	*Panicum philadelphicum*	E
Plant (Vascular)	Sharp-glumed manna-grass	*Glyceria acutifolia*	P
Plant (Vascular)	Shining ladies'-tresses	*Spiranthes lucida*	P
Plant (Vascular)	Simple willow-herb	*Epilobium strictum*	T
Plant (Vascular)	Straw sedge	*Carex straminea*	P
Plant (Vascular)	Strict blue-eyed grass	*Sisyrinchium montanum*	T
Plant (Vascular)	Variegated scouring-rush	*Equisetum variegatum*	E
Plant (Vascular)	Water avens	*Geum rivale*	P
Plant (Vascular)	Woodland Horsetail	*Equisetum sylvaticum*	P
Reptile	Eastern garter snake	*Thamnophis sirtalis*	SC
Reptile	Smooth green snake	*Opheodrys vernalis*	SC

OHIO STATUS:
E = Endangered
T = Threatened
SC = Species of Concern**
SI = Special Interest**
P = Potentially Threatened**
X = Extirpated
*Arborvitae was planted on site and does not occur naturally within the facility.
**Administrative status; not a legal designation

Source: Source: USFWS, 2014; DNAP, 2014; ODOW, 2012; BHE, 2012

Attachment 8 - Rare Bird Species Observed but Not Known to Nest at the CRJMTC

Common Name	Scientific Name	State Status	Federal Status
American bittern	*Botaurus lentiginosus (migrant)*	E	-
Dark-eyed junco	*Junco hyemalis (migrant)*	T	-
Great Egret	*Ardea alba (migrant)*	SC	-
Hermit thrush	*Catharus guttatus (migrant)*	T	-
Sandhill Crane	*Grus Canadensis*	E	-
Trumpeter swan	*Cygnus buccinator (migrant)*	E	-

FEDERAL STATUS
E = Endangered (Danger of extinction throughout range)

OHIO STATUS
E = Endangered
T = Threatened

Attachment 8 - Rare Bird Species Observed but Not Known to Nest at the CRJMTC

Common Name	Scientific Name	State Status	Federal Status
T = Threatened (Likely to become endangered in foreseeable future throughout range) C = Federal Candidate		P = Potentially Threatened (Administrative status; not a legal designation) SC = Species of Concern SI = Special Interest (Administrative status; not a legal designation)	

Source: Camp Ravenna Surveys; USFWS; Ohio DNR

APPENDIX A

SIGNED DOCUMENTATION AND CORRESPONDENCE

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

December 17, 2015

Mr. Mark Leeper
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage
267000859160

Subject: **Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Comments on the Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops, Dated December 9, 2015. Ohio EPA ID # 267-000859-160**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Comments on the "Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site CC- RVAAP-80 Group 2 Propellant Can Tops" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. These responses to comments were received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on December 10, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by PIKA International, Inc., under Contract Number W912QR-12-F-0212.

The response to Ohio EPA comments provided clarifications on site clearing using Unexploded Ordnance (UXO) Technicians, Incremental sampling methodologies (ISM) and the Quality Assurance Project Plan, specifically related to laboratory Reporting Limits.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), the response to Ohio EPA comments are satisfactory and the document may be finalized.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvr

cc: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Gregory F. Moore, USACE
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Justin Burke, Ohio EPA, CO, DERR
Al Muller, Ohio EPA, NEDO, DDAGW

APPENDIX B

COMMENT RESPONSE TABLE

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

September 2, 2015

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to comments on the Final Project Work Plan, Revision 1, and the Revised Draft Project Work Plan for Site Inspection at CC RVAAP-80, Group 2 Propellant Can Tops, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio
Ohio EPA ID 267-000859-036

Dear Mr. Palombo:

Enclosed, for your review and approval, please find the responses to comments dated 16 July, 2014, on the Final Project Work Plan, Revision 1, for Site Inspection at Compliance Restoration Site CC-80 Group 2 Propellant Can Tops. Also enclosed is the Revised Draft Project Work Plan for Site Inspection at CC-80 Group 2 Propellant Can Tops. The revised draft project work plan replaces the previously submitted final document, necessitated by the addition of the collection/disposal of the propellant cans and tops.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submittal.

Sincerely,

Mark S. Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Rod Beals, Ohio EPA, DERR-NEDO (email transmittal letter only)
Justin Burke, Ohio EPA, CO-DERR (email letter and document w/o attachments)
Brian Tucker, Ohio EPA, CO-DERR (email letter and document w/o attachments)

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna (letter and CD of document)
Katie Tait, OHARNG, Camp Ravenna (letter and printed document)
Greg Moore, USACE Louisville (email transmittal letter only)

Subject: Revised Draft Work Plan for Compliance Restoration Site CC RVAAP-80, Group 2 Propellant Can Tops, Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio, Ohio EPA ID 267-000859-036

Jay Trumble, USACE Louisville (letter and printed document)
Admin Records Manager, Camp Ravenna (letter with two printed copies and two CDs)

DOCUMENT: Final Project Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP- 80 Group 2 Propellant Can Tops. REV 1
REVIEWER: Ohio EPA, Kevin Palombo
DATE: July 16, 2014

CMT #	PAGE # LINE #	COMMENT	Recommendation / Requirement	RESPONSE
	General	Ohio EPA, the National Guard Directorate, and the US Army Corps of Engineers have been in discussion regarding this site and others where possible Munition Debris (MD) or Munition Constituents (MC) have been identified and are buried or are on the ground surface. Whether the Propellant Can Tops are defined as MD or possibly MC, to Ohio EPA they are considered a solid waste. It is the understanding of Ohio EPA that there may be some question as to funding mechanisms for certain types of clean-up. This Plan actually calls out the intent to "collect and dispose of all metallic items within the AOC," i.e., Appendix A, Statement of Work, Section 4.0, paragraph 1, which Ohio EPA agrees should be completed. Regardless of funding mechanism, Ohio EPA refers the National Guard Directorate and US Army Corps of Engineers to Ohio Revised Code 3734.03 and the Ohio Administrative Code 3745.27.0SC, which defines the regulations prohibiting open dumping and requirements for proper removal, disposal or management of the solid waste.		The propellant cans and tops were munitions packing material, and therefore qualify as material potentially presenting an explosive hazard (MPPEH). The Work Plan and accompanying documents have been revised (see follow on comment responses) to treating the Propellant Cans and Tops as MPPEH and include the following tasks: • Re-acquiring the coordinates of each anomaly documented in the Final Investigation Report for the Compliance Restoration Site CC-RVAAP-80, Group 2 Propellant Can Tops and other Environmental Services, January 27, 2012. • Conducting a surface clearance for the propellant can and tops with a 1 meter radius of each anomaly. • Collecting, inspecting and certifying the recovered Propellant Cans and Tops as MDAS. • Shipping them to a licensed facility Other areas of the document have been adjusted to accommodate the modification to the scope of this project.

				Because this new work is being added to the plans, they will need to undergo Army review as pre drafts before being sent to Ohio EPA as draft plans.
Project Work Plan				
1	Page 6, section 1.4	RVAAP CC-RVAAP-80: Group 2 Propellant Can Tops, Paragraph 1 describes the initial identification of 5 clusters of ferrous items in 2011 and that soils in the vicinity of three of the clusters were sampled at that time. A review of the previous report dated January 27, 2012 (Final Investigation Report for CC Site CC-RVAAP-80 Group 2 Propellant Can Tops ..." identified propellants in soils from all three of the clusters. It is understood the concentrations were below Facility Wide Clean-Up Goals (FWCUGS); however, these compounds should be identified in this section. In fact a summary table showing these "hits" from the 2011 sampling event would be very useful in this plan. It is also important to note that although the primary focus and title of the current evaluation highlights propellant can tops, a number of propellant cans were also identified in the study area. This should also be mentioned in this section. This section should explain the physical characteristics of propellant cans and tops/lids and how they were used as a munition and an		The text in the paragraph that discusses the results of the previous Site inspection now reads as follows: "The soil samples were analyzed for target analyte list (TAL) metals, and common propellants used by the Department of Defense (DoD) including nitrocellulose, nitroglycerine, nitroguanidine, and perchlorate. One (1) of the three samples was also analyzed for the RVAAP full suite, (including explosives, propellants, volatile organic compounds; VOCs, semi-volatile organic compounds; SVOCs, and poly chlorinated bi-phenyls; PCBs). The three samples did not reveal any analytes exceeding the facility-wide cleanup goals (FWCUGs). The data obtained through this site inspection will be used to determine the need for a Remedial Investigation or support project closeout in the SI phase." The text in this section (in three places) was revised to read "...propellant cans and tops..."

		explanation of why they are located at this location. Based on their use, why is it expected or not expected that residual propellants remain in media surrounding them. This information has never been satisfactorily provided in any of the reports on the Group 2 Propellant Can Tops area. This information would help to alleviate some of the discomfort Ohio EPA has with this area of concern.		A history or the physical characteristics, their use and origin of the propellant tops and cans was provided by the Baltimore District Corps of Engineers. The entire document has been attached to the WP document as Appendix H and the following summary of this history has been inserted into Section 1.4 : In order to identify the types of propellant tops and cans found at the Group 2 Area, the types of artillery ammunition must be discussed. There are basically three types of artillery ammunition; Fixed, Semi-Fixed and Separate Loading. • **Fixed:** ammunition in which the projectile is permanently attached to a case that contains the primer and the propellant in distinction from separate-loading ammunition • **Semi-fixed:** ammunition consisting of complete rounds that can be loaded as a unit but have a cartridge case which is not fixed to the projectile and can be removed in order to remove increments of the propelling charge. • **Separate loading:** ammunition in which the projectile, propelling charge and primer are shipped and loaded separately rather than as a unit. The propellant grains for all three types of ammunition are packed into cloth bags (increments) and securely stitched to prevent spillage of the propellant grains which would

				potentially change the desired range of the projectile fired. The fixed and semi-fixed ammunition are loaded as one unit with the propellant located in the cartridge case in tar impregnated fiberboard containers. These containers have steel tops/bottoms and a clip to hold the projectile in place. When secured within the fiberboard container the cartridge case has a closure disk which secures the propellant within the case. As long as the fiberboard container is intact it is physically impossible for the propellant to come in contact with the steel ends. For separate loading ammunition the projectile, primer, fuze and propelling charge are shipped separately. There is no evidence of projectiles, primers and/or fuzes having been discovered on the site. The propellant containers are manufactured as a heavy steel cylinder with locking cap which supports and protects the propellant during shipping and storage. The propellant cans and tops for separate loading charges are identical to those found on the site. The propellant bags (increments) are tightly placed within the protective wrapper to prevent any movement and any contact with the steel of the can in order to prevent the risk of propellant being ignited by a spark and/or static electricity. Cardboard packing material is then placed on top of the propellant increments and the cap inserted and locked in the top of the can. At no time does the propellant come in contact with the steel of the can. During the firing of artillery projectiles it is critical that the propellant grains

				maintain their shape and integrity and as such the individual grains cannot be subjected to rough handling which would cause them to crack or break. Given the care taken to prevent damage to the propellant grain and prevention of contact with the steel can, it is extremely unlikely that the propellant grains would break, much less be reduced to dust. Additionally, as the powder bag would not allow release. Shipping containers/caps are not munitions rather the means used to transport the propellant to the appropriate firing point. Currently shipping containers and packing materials are classified as material potentially presenting an explosive hazard (MPPEH) until inspection and verification that propellant has been removed. Upon completion of this inspection process the items would be immediately reclassified as material documented as safe (MDAS) and as such able to be released to the public. All caps recovered to date at Former Ravenna Army Ammunition Plant (RVAAP) have been classified as MDAS. Given the former mission of RVAAP it is no surprise that propellant was stored and containers renovated at the facility. A review of the Historical Summary of Ravenna Arsenal by the Baltimore Corps of Engineers District determined that it became necessary to repack certain propellant charge 155mm and 8 inch from wooden overpack to cartridge storage cases. The project was set up at the Depot Bundling Building, and over a period of seven months many hundreds of thousands were

				repacked into cartridge storage cases. This would explain why there were empty propellant storage cans on site but provides no suggestion on why individual ends and debris were located at the Group 2 area. It is likely that the items recovered were most likely excess and/or were deemed unserviceable for use in repacking although there is no specific historical data to support this. Given the activities which took place on other ammunition storage facilities and the types of debris recovered it is a reasonable assumption. The protection of the propellant grains and safety of workers during shipping and handling was critical therefore every effort was/is made to minimize movement of the propellant grains and completely eliminate the possibility of contact with the steel containers. Therefore, potential for propellant residue to be located on the steel shipping container or cap is highly unlikely. The Baltimore District provided a detailed discussion which is provided in Appendix H of this WP.
2	Page 9, Section 2.4.2.	This section provides an overview of the operational sequence of activities. Provide a descriptive word in Number 2, i.e., "Collect ISM surface and subsurface (using Geoprobe) soil samples ..." or others as appropriate.		Item No. 2 has been revised to read as follows: 2. Identify, collect, certify as safe and dispose of the propellant tops and cans associated the anomalies identified during the previous site investigation. 3. Collect ISM five (5) surface and three (3)

				subsurface soil samples within the areas of the referenced anomalies
3	Page 10, Section 2.6.	Management Roles and Responsibilities General. This section needs to be updated to include Gregory F. Moore of the US Army Corps of Engineers.		Acknowledged. The text has been revised as noted.
4	Page 21, Section 2.11.5. 2	Emergency Response and General Notifications. This section needs to be updated to include Gregory F. Moore of the US Army Corps of Engineers.		Acknowledged. The text has been revised as noted.
5	Page 23, Section 2.13,	Paragraph 1 refers the reader to Appendix B Figure 5 and describes where soil samples are proposed to be collected. Ohio EPA believes that based on a review of the "scatter' of the identified ferrous anomalies on Figure 5 that an additional ISM surface sample location should be added north of Cluster 2 in the area surrounding anomaly points 60105 , 60106, 60107, and 60108. This section also mentions that one sample will be collected for the full RVAAP suite of analyses. Please clarify that this particular sample will be a "discreet" sample and not an ISM sample. Also, how will the decision be made where to collect this sample? Ohio EPA suggests the sample be collected where the		Due to the addition of a new section 2.13 which describes the collection of MPPEH Propellant Cans and Tops, this section “Collecting Surface Soil Samples is now numbered 2.14. An additional ISM surface soil sample has been added in the area of the referenced anomalies (increasing the number of surface ISM samples to 5) and is shown on the revised Figure 5 in Appendix B. The one sample collected for the full RVAAP suite of analyses will be collected as an ISM sample with the exception of the VOC aliquot, which will collected as a discreet sample – consistent with past sampling at the site. The discreet volatile aliquot will be collected in the area of the highest concentration of ferrous

		highest concentration of ferrous anomalies (propellant cans or lids) are present. Please clarify how the use of the incremental sampling methodology will not destroy propellants including perchlorates prior to analysis.		anomalies (propellant cans or tops) as recommended. The ISM preparation method involves the combination of short duration grinding and cool down periods so as not to affect/impact the integrity of the contaminants of concern (propellants and perchlorate).
6	Section 2.14	Disposal of IDW, Page 24. This section describes the handling of Investigation Derived Waste but does not define what type of waste is anticipated. Ohio EPA requires that any metallic/ferrous waste found at the surface be collected and disposed of per ORC 3734.03 and OAC 3745.27.05C. This material can be recycled based on descriptions provided. Ohio EPA can even provide contacts with Portage County Solid Waste Management to facilitate this recycling at your request. If any waste is left in place below the surface, the area must be classified as a solid waste management unit for future land use purposes.		The text has been revised to read as follows: The potential types of IDW include the propellant cans and tops, the dedicated plastic liners and sampling implements from the soil sampling activities and a limited volume of decontamination fluids. Within 90 days of the generation of IDW, PIKA will characterize and properly dispose or recycle (per ORC 3734.03 and OAC 3745.27.05C) of all IDW at approved off-site facilities in compliance will all applicable federal, state, and local rules, laws, and regulations.
7	Section 2.20	Site Inspection (SI) Report, page 27 provides a description of activities that will be made part of the SI Report. Ohio EPA notes that the last of these is the location of the recovered ferrous items. We understand that removal was not intended to be part of the investigation, but Ohio EPA requires that these solid waste materials be removed per our Solid Waste Regulations that are cited in Question 6, above.		As noted above in response to the General Comment the project scope has been revised to re-acquire the anomaly locations identified in the 2012 limited SI, recover the propellant cans and tops at those locations and certify them as MDAS for recycling/disposal, as appropriate. The text in this section has been revised as follows: “PIKA will prepare and submit a preliminary draft, draft and final SI report for this project

		The report should also provide a clear summary table of all identified compounds within the body of the report. This table should include the data from 2011.		with the preliminary draft being submitted within 90 calendar days following the completion of the field investigation activities. The SI report will document the process and procedures used in conducting the investigation; and describe all the soil sampling activities conducted during this project. The SI report will include details about premobilization, mobilization, site preparation, sample collection, decontamination, analytical results (including the results from the 2012 limited SI) waste management, event chronology, final site inspection, and mapping. The report will also document the collection, certification and disposal/recycling of the propellant cans and tops as MDAS. The SI report maps will delineate the boundaries of the site, locations of ISM sample area boundaries."
Appendix A – Scope of Work				
8	Section 1.2 Area of Concern	There is no page numbers present. An acronym was used and not defined, RRD. It is assumed it is referring to range related debris. Please include this acronym on the list on page vii. Based on photographs and information presented in January 27, 2012, Final Investigation Report on the Propellant Can Tops area, propellant cans were also		The Revised Statement of work dated 10March2015 will be included in Appendix A and has page numbers. The acronym RRD is defined in the Statement of Work on Page 3, first paragraph above Section **1.0 General Information**. The acronym has also been added to the list of Acronyms in the WP Table of Contents. Both the revised statement of work (provided in Appendix A) and the WP now reflect the

		identified, please provide this information in this section.		presence of propellant cans and tops.
9	Section 4.0	Paragraph 1 states that a contractor will collect and dispose of all metallic items within the AOC. Ohio EPA supports this statement and encourages its fulfillment		The text has been revised to reflect that all propellant cans and tops associated with the ferrous anomalies identified in the 2012 SI will be collected, removed and certified as MDAS. Other ferrous items will be identified for the OHARNG to collect and dispose/recycle as appropriate.
Appendix C – Points of Contact				
10		Gregory F. Moore with the US Army Corps of Engineers should be added to this contact list.		Acknowledged. The text has been revised as noted.
Appendix F-Cumulative Documentation and Correspondence and G-Comment Response Table				
11		In Appendix F, an April 3, 2013, e-mail memo from Jay Trumble of the US Army Corps of Engineers to Brian Stockwell of PIKA International Inc. explains that the Army intends to descope the collection of can tops from the task order to complete the site inspection; however, a response to Ohio EPA comments based on the April 3, 2013, e-mail in Appendix G and dated June 18, 2013, states, "the removal will occur as originally discussed." These discrepancies will need to be clarified prior to moving forward with the Site Investigation.		As noted above in response to the General Comment the project scope has been revised to re-acquire the anomaly locations identified in the 2012 limited SI, recover the propellant cans and tops at those locations, certify and dispose/recycle them as MDAS.

DOCUMENT: Revised Draft Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops, Dated September 8, 2015
REVIEWER: Comments by Ohio EPA, Kevin Palombo
DATE: October 29, 2015

CMT #	PAGE # LINE #	COMMENT	Recommendation /Requirement	RESPONSE
Project Work Plan				
1	Page 26, Section 2.13	An expression is used in this section, "PIKA will clear the locations of the previous anomalies of all propellant can tops ... "and," ... the UXO Technicians will clear the area within a one meter radius ... ". Does this expression mean that the propellant can lids will be removed? Ohio EPA understands from other locations in the documents that these materials will be removed and properly disposed.		Yes. The text relates more to the land, than the metal. Clearing means that all of the propellant cans and can tops at each reacquired anomaly location will be picked up, then the metal detector will be used to make sure another can top isn't lying just below the ground surface at the same location. The ordnance professionals will stop when that location doesn't have any cans or tops left. The Text has been revised as follows: "Once reacquired, PIKA will mark each anomaly with a pin flag, inspecting the area within a 1 meter radius, removing all propellant cans and tops. "
2	Appendix B, Figure 5	Figure 5 provides the proposed samples locations for the collection of ISM samples. How was the size of each decision unit determined? It appears some are much larger than others, even though they have a similar number of anomalies. Wouldn't a larger decision unit around the same number of anomalies allow for the possibility of more diluted sample result? Why was the red circle in the northwest part of Figure 5 left partially completed? It is assumed the whole area of the circle is the decision unit. Please provide explanations for these questions.		The goal of the sampling in the SI is to determine if a release occurred. As the can tops, and cans were found in five clusters, and scattered across the site, the soil at the location of the clusters represents the best place to find evidence of a release. The sample locations in themselves are not decision units, but an attempt to represent what impact if any, the work with the cans and tops had on the soil. As the samples relate to the top deposition, they should be representative. During the first part of this SI, the sample areas were; MI sample area 1 equaled 198 square meters;

				MI sample area 2 equaled 553 square meters; and MI sample area 3 equaled 330 square meters. The primary objective of the Figure was to incorporate the anomalies identified and selected by the stakeholders to ensure that they were included in each of the incremental samples for that decision unit. Once mobilized, and the anomalies reacquired, each of the IS decision unit areas will be refined in the field to a shape that reflects the included anomalies and surveyed. As for the incomplete red circle in the northwest portion of the figure – the reviewer is correct. It should be displayed as a complete circle. This was the result of a production error and has been corrected.
3	Page 27, Section 2.14, Sentences 4 and 5	Please explain that ISM surface soil samples will be collected within the designated ISM from 0-1 foot and from 1-4 feet below ground surface (bgs). It is understood that propellant can tops and lids were identified at most locations within the top nine inches of the ground surface. It is also understood that the shallow (0-1 foot) samples will be analyzed for TAL metals, and common propellants and perchlorate. Is there a chance soils collected so shallow may have oxidized or in other ways reacted so that the results might be biased low?		To clarify this section, sentences 4, 5 and 6 have been revised to read as follows: “Five (5) surficial ISM samples (0-1‘ bgs) and three (3) subsurface ISM samples (1-4’ bgs) (eight primary, plus quality assurance (QA) samples) will be collected from the designated decision units, depicted on Figure 5 in Appendix B.” The soil samples collected from the 0-1 foot interval are being collected where direct contact with the soil is possible. The sampling will show the current conditions, and identify a risk (if any) that proves that a RI (nature and extent) is necessary. We do not estimate that the past work with the cans/tops would have resulted in a release, but

				in case it did, the 1-4 ft samples can show if anything is moving downward through the soil.
Appendix D – Sampling and Analysis Plan				
4	page 19, Section 5.6.1 sentence 3	Section 5.6.1 sentence 3 states, "A total five ISM surface soil samples will be collected from 0 to one (1) foot bgs ..." Sentence 4 states, "No sediment samples are anticipated to be sampled." What does it mean that "no sediment samples are anticipated to be collected?" This Sampling and Analysis Plan does not agree with page 27, Section 2.14 of the Revised Draft Project Work Plan. Please make the correction. Ohio EPA anticipates samples will also be collected from 1-4 feet bgs at locations shown on Figure 5, and as provided in the Work Plan.		The WP discusses Surface and Subsurface IS in the same Section of the document - Page 27, Section 2.14, whereas the format of the SAP (based upon the RVAAP facility-wide document) separates the discussion of the two types of samples into separate sections. Subsurface Soil [samples] are presented in Section 5.5 (5.5.1 identifies the Rationale for the 3 subsurface IS) and separately discusses Surface Soil and Sediment [samples] in Section 5.6 (5.6.1 identifies the Rationale for the 5 surface IS). The title of Section 5.6 also includes the potential for the collection of sediment samples. Since Sediment Sampling is not part of the project scope - the statement "No sediment samples are anticipated to be collected." Was included to close out that potential sample matrix. This portion of the text was moved to the end of the paragraph to provide better continuity and revised to read: "Sediment samples are not included in this investigation scope of work."
Appendix E – Quality Assurance Project Plan				
5	Page 4, Section 2.4.2, paragraph	Section 2.4.2, paragraph 2, last sentence states, "Multiple smaller areas where anomalies are found may be combined into one designated ISM sample area." This is unclear, please provide		Agree that the text as stated is confusing. This sentence has been deleted as it does not provide additional clarity to the discussion. As noted above in response to Comment 2, once

	2	additional clarification.		mobilized, and the anomalies reacquired, each of the IS decision unit areas will be refined in the field to a shape that reflects the specified anomalies, the boundaries of which will then be surveyed. There are five clusters of can tops on the site. We currently have more than five total surficial samples scoped. Based upon the history, we do not believe the cans and tops could be the source of a release, but if they are, sampling in the same location as the can tops would yield the highest results. The exact location of the northwestern sample can be determined in the field. It is estimated that the individual aliquots will be placed near where can tops/cans were identified/currently exist in that portion of the site.
6	Table 4-1	This table provides a soil Reporting Limit of 250 ug/Kg. Will this reporting limit for these compounds exceed the CUGs? Will you report data that is above the Method Detection Limit (MDL) but below the Reporting Limit (RL) as "J" value, or not at all? Why is the RL so much higher than the MDL?		Upon review of Table 4-1, the Reporting limits were found to be incorrect and have been revised. Also, upon completing that review, it was determined that a revision to the DOD QSM was issued since this project was initiated in 2012, (Version 5.0, July 2013). So that revision has been made in the QAPP text. The project will be now performed in the TestAmerica – Sacramento Lab who is approved for Version 5.0. The SVOC extraction will now be performed using 3550 (Sonication) as per the QSM Version 5.0. In addition, since typically

				laboratories update their MDLs and RLs periodically, the Section 4 tables (Tables 4-1 through 4-5) were reviewed and revised by TestAmerica to reflect their current values for all analytes listed in the tables. Please see attached. Yes, Upon comparison, these revised reporting limits will satisfy the CUGs. YES, results between the MDL and RL will be reported and flagged as a “j” value.

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

4.1 Data Quality Objectives (DQOs)

DQOs summaries for this investigation will follow Tables 4-1 and 4-2 in the FWQAPP. All QC parameters stated in the specific U.S. Environmental Protection Agency (USEPA) SW-846 methods will be adhered to for each chemical listed. Laboratories are required to comply with all methods as written: recommendations are considered requirements. Concurrence with the *DoD Quality System Manual (QSM) for Environmental Laboratories* (Environmental Data Quality Workgroup, Version 5.0~~4.2~~, 201~~3~~0), and the Louisville QSM Supplement (USACE, 2007) is expected. The contract laboratory will provide Level IV data packages.

The contract laboratory will deliver an electronic data deliverable (EDD) that is automated data review (ADR) compatible. The contract laboratory must identify variances to the established library prior to any analysis being performed. No variances to the DoD QSM Environmental Laboratories and the Louisville QSM Supplement are anticipated.

4.2 Level of Quality Control Effort

QC efforts will follow Section 4.2 of the FWQAPP. Field Measurements will include field duplicates and equipment rinsate blanks. Laboratory QC measurements will include method blanks, laboratory control samples (LCSs), laboratory duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples. LCS measurements will include the standard mid-level analyte concentration, plus QC method reporting level (MRL) low-level concentration. It is recognized that the laboratory will routinely perform and monitor the QC/MRL; however, guidance check limits will be utilized, as advisory and corrective action will not be required for individual analyte variances. The QC/MRL will be successfully analyzed at the beginning of the analytical sequences as required by the DoD QSM. Additionally, the lab will analyze the QC/MRL sample at the close of the analytical sequence.

4.3 Accuracy, Precision, and Sensitivity of Analysis

Accuracy, precision, and sensitivity goals will follow Section 4.3 of the FWQAPP. The accuracy and precision required for the specified analytical parameters listed in Section 2, Table 2-1, are incorporated in Tables 4-1 and 4-2 of the FWQAPP and are consistent with the analytical requirements found in the DoD QSM.

Laboratories will make all reasonable attempts to meet the reporting levels in Tables 4-3 through 4-9 of the FWQAPP for each individual sample analysis. When samples require dilution, both the minimum dilution and quantified dilution must be reported. All samples will be screened to determine optimum dilution ranges. Dilution runs will be performed to quantify high target analyte concentrations within the upper half of the calibration range, thus reducing the degree of dilution as much as possible. In addition, a five-times-less diluted run will be performed to report other target analyte reporting levels as low as possible without destroying analytical detectors and instrumentation. If there are matrix interferences, non-target analyte, or high-target analyte concentrations that preclude analysis of an undiluted sample, the laboratory project manager will contact PIKA, forward analytical and chromatographic information from diluted runs, and obtain direction on how to proceed. The PIKA PM will then contact the USACE CELRL, and Ohio EPA to discuss the data and the path forward.

The analyte lists and detection limits for the analyses listed in Section 2.5 are included in Tables 4-1 through 4-5.

Table 4-1

Volatile Organic Compounds (VOC) Method 8260 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		ug/Kg		ug/L	
1,1,1-Trichloroethane	71-55-6	.036	5.0	0.19	1
1,1,2,2-Tetrachloroethane	79-34-5	0.68	5.0	0.15	1
1,1,2-Trichloroethane	79-00-5	0.44	5.0	0.31	1
1,1-Dichloroethane	75-34-3	0.29	5.0	0.15	1
1,1-Dichloroethene	75-35-4	0.26	5.0	0.14	1
1,2-Dibromoethane	106-93-4	0.27	10.0	0.22	2
1,2-Dichloroethane	107-06-2	0.73	5.0	0.22	1
1,2-Dichloroethene, Total	540-59-0	0.89	5.0	0.11	1
1,2-Dichloropropane	78-87-5	0.60	5.0	0.15	1
2-Butanone	78-93-3	1.40	10.0	0.35	2
2-Hexanone	591-78-6	0.74	10.0	0.17	2
4-Methyl-2-pentanone	108-10-1	0.92	10.0	0.18	2
Acetone	67-64-1	1.40	20.0	2.1	10
Benzene	71-43-2	0.26	5.0	0.13	1
Bromochloromethane	74-97-5	0.94	5.0	0.14	1
Bromodichloromethane	75-27-4	0.53	5.0	0.14	1
Bromoform	75-25-2	0.40	5.0	0.1	1
Bromomethane	74-83-9	0.86	5.0	0.29	1
Carbon disulfide	75-15-0	0.49	10.0	0.16	2
Carbon tetrachloride	56-23-5	0.53	5.0	0.15	1
Chlorobenzene	108-90-7	0.29	5.0	0.12	1
Chloroethane	75-00-3	0.45	5.0	0.34	1
Chloroform	67-66-3	0.26	5.0	0.12	1
Chloromethane	74-87-3	0.50	5.0	0.25	1
cis-1,2-Dichloroethene	156-59-2	0.89	5.0	0.1	1
cis-1,3-Dichloropropene	10061-01-5	0.64	5.0	0.22	1
Dibromochloromethane	124-48-1	0.26	5.0	0.13	1
Ethylbenzene	100-41-4	0.34	5.0	0.15	1
Methylene Chloride	75-09-2	0.84	5.0	0.35	1
m-Xylene & p-Xylene	179601-23-1	0.81	5.0	0.18	1
o-Xylene	95-47-6	0.33	5.0	0.1	1

Table 4-1 (continued)

Volatile Organic Compounds (VOC) Method 8260 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		ug/Kg		ug/L	
Styrene	100-42-5	0.31	5.0	0.15	1
Tetrachloroethene	127-18-4	0.61	5.0	0.15	1
Toluene	108-88-3	0.61	5.0	0.25	1
trans-1,2-Dichloroethene	156-60-5	0.38	5.0	0.11	1
trans-1,3-Dichloropropene	10061-02-6	0.75	5.0	0.15	1
Trichloroethene	79-01-6	0.60	5.0	0.13	1
Vinyl chloride	75-01-4	0.36	5.0	0.22	1
Xylenes, Total	1330-20-7	0.81	5.0	0.18	1.5

[a] Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

Table 4-2

Semivolatile Organic Compounds (SVOC) Method 8270 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		ug/Kg		ug/L	
1,2,4-Trichlorobenzene	120-82-1	83.0	330	1.4	10
1,2-Dichlorobenzene	95-50-1	75.0	330	1.5	10
1,3-Dichlorobenzene	541-73-1	78.0	330	1.5	10
1,4-Dichlorobenzene	106-46-7	77.0	330	1.4	10
2,4,5-Trichlorophenol	95-95-4	83.0	330	2	10
2,4,6-Trichlorophenol	88-06-2	84.0	330	2	10
2,4-Dichlorophenol	120-83-2	89.0	330	2.6	10
2,4-Dimethylphenol	105-67-9	167	500	2.2	10
2,4-Dinitrophenol	51-28-5	214	2000	20	60
2,4-Dinitrotoluene	121-14-2	89.0	330	2	10
2,6-Dinitrotoluene	606-20-2	99.0	330	2	10
2-Chloronaphthalene	91-58-7	81.0	330	1.3	10
2-Chlorophenol	95-57-8	88.0	330	1.6	10
2-Methylnaphthalene	91-57-6	85.0	330	1.5	10
2-Methylphenol	95-48-7	58.0	330	0.93	10
2-Nitroaniline	88-74-4	84.0	1600	2	50
2-Nitrophenol	88-75-5	82.0	330	1.9	10
3,3'-Dichlorobenzidine	91-94-1	94.0	1600	0.96	50
3-Methylphenol & 4-Methylphenol	15831-10-4	330	1000	1.15	10
3-Nitroaniline	99-09-2	167	1600	1.4	50
4,6-Dinitro-2-methylphenol	534-52-1	81.0	2000	2.2	60
4-Bromophenyl phenyl ether	101-55-3	85.0	330	1.1	10
4-Chloro-3-methylphenol	59-50-7	92.0	330	2	10
4-Chloroaniline	106-47-8	58.0	330	2	10
4-Chlorophenyl phenyl ether	7005-72-3	93.0	330	1.1	10
4-Nitroaniline	100-01-6	88.0	1600	1.5	50
4-Nitrophenol	100-02-7	280	2000	6.1	60
Acenaphthene	83-32-9	83.0	330	1.1	10
Acenaphthylene	208-96-8	85.0	330	1.1	10
Anthracene	120-12-7	86.0	330	1	10
Benzo[a]anthracene	56-55-3	92.0	330	1	10
Benzo[a]pyrene	50-32-8	94.0	330	1	10
Benzo[b]fluoranthene	205-99-2	95.0	330	1.2	10
Benzo[g,h,i]perylene	191-24-2	110	330	1.4	10
Benzo[k]fluoranthene	207-08-9	113	330	0.96	10
Benzoic acid	65-85-0	289	1600	20	75
Benzyl alcohol	100-51-6	170	510	2.6	10
bis (2-chloroisopropyl) ether	108-60-1	79.0	330	1.3	10

Table 4-2 (continued)

Semivolatile Organic Compounds (SVOC) Method 8270 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		ug/Kg		ug/L	
Bis(2-chloroethoxy)methane	111-91-1	88.0	330	1	10
Bis(2-chloroethyl)ether	111-44-4	81.0	330	1.5	10
Bis(2-ethylhexyl) phthalate	117-81-7	98.0	330	1	10
Butyl benzyl phthalate	85-68-7	95.0	330	1.4	10
Carbazole	86-74-8	95	330	1.2	10
Chrysene	218-01-9	84	330	1	10
Dibenzo(a,h)anthracene	53-70-3	102	330	2	10
Dibenzofuran	132-64-9	86	330	1.1	10
Diethyl phthalate	84-66-2	90	330	0.93	10
Dimethyl phthalate	131-11-3	87	330	0.88	10
Di-n-butyl phthalate	84-74-2	97	330	1.1	10
Di-n-octyl phthalate	117-84-0	97	330	1.5	10
Fluoranthene	206-44-0	95	330	1	10
Fluorene	86-73-7	92	330	0.93	10
Hexachlorobenzene	118-74-1	89	330	1.4	10
Hexachlorobutadiene	87-68-3	82	330	1.3	10
Hexachlorocyclopentadiene	77-47-4	62	1600	5	50
Hexachloroethane	67-72-1	81	330	1.4	10
Indeno[1,2,3-cd]pyrene	193-39-5	96	330	3.4	10
Isophorone	78-59-1	93	330	1	10
Naphthalene	91-20-3	82	330	1.3	10
Nitrobenzene	98-95-3	76	330	1.6	10
N-Nitrosodi-n-propylamine	621-64-7	84	330	1.4	10
N-Nitrosodiphenylamine	86-30-6	86	330	1	10
Pentachlorophenol	87-86-5	51	1600	5	60
Phenanthrene	85-01-8	94	330	1	10
Phenol	108-95-2	83	330	1.1	10
Pyrene	129-00-0	94	330	1.4	10

a Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

Table 4-3

Pesticides Method 8081 DoD and Polychlorinated Biphenyls (PCBs) Method 8082 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		ug/Kg		ug/L	
Method 8081					
4,4'-DDD	72-54-8	0.26	1.7	0.012	0.05
4,4'-DDE	72-55-9	0.22	1.7	0.012	0.05
4,4'-DDT	50-29-3	0.4	1.7	0.012	0.05
Aldrin	309-00-2	0.21	1.7	0.006	0.05
alpha-BHC	319-84-6	0.22	1.7	0.007	0.05
alpha-Chlordane	5103-71-9	0.2	1.7	0.006	0.05
beta-BHC	319-85-7	0.33	1.7	0.007	0.05
delta-BHC	319-86-8	0.16	1.7	0.011	0.05
Dieldrin	60-57-1	0.091	1.7	0.012	0.05
Endosulfan I	959-98-8	0.1	1.7	0.006	0.05
Endosulfan II	33213-65-9	0.1	1.7	0.012	0.05
Endosulfan sulfate	1031-07-8	0.092	1.7	0.012	0.05
Endrin	72-20-8	0.11	1.7	0.012	0.05
Endrin aldehyde	7421-93-4	0.11	1.7	0.025	0.1
Endrin ketone	53494-70-5	0.34	1.7	0.02	0.1
gamma-BHC (Lindane)	58-89-9	0.17	1.7	0.006	0.05
gamma-Chlordane	5103-74-2	0.1	1.7	0.012	0.05
Heptachlor	76-44-8	0.19	1.7	0.007	0.05
Heptachlor epoxide	1024-57-3	0.12	1.7	0.006	0.05
Methoxychlor	72-43-5	1.3	3.4	0.042	0.1
Toxaphene	8001-35-2	20	67	0.51	2
Method 8082					
Aroclor-1016	12674-11-2	3.4	33	0.15	1
Aroclor-1221	11104-28-2	5.2	33	0.53	1
Aroclor-1232	11141-16-5	6.4	33	0.16	1
Aroclor-1242	53469-21-9	7.4	33	0.25	1
Aroclor-1248	12672-29-6	5.7	33	0.24	1
Aroclor-1254	11097-69-1	2.7	33	0.19	1
Aroclor-1260	11096-82-5	2.9	33	0.22	1

a Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

Table 4-4

Explosives - Method 8330B
Propellants - Method 8330 Modified and 353.2
Perchlorate - Method 6860

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		mg/Kg		ug/L	
1,3,5-Trinitrobenzene	99-35-4	0.02	0.25	0.031	0.15
1,3-Dinitrobenzene	99-65-0	0.05	0.25	0.05	0.15
2,4,6-Trinitrotoluene	118-96-7	0.02	0.25	0.05	0.15
2,4-Dinitrotoluene	121-14-2	0.02	0.25	0.05	0.13
2,6-Dinitrotoluene	606-20-2	0.03	0.25	0.05	0.13
2-Amino-4,6-dinitrotoluene	35572-78-2	0.1	0.25	0.03	0.15
2-Nitrotoluene	88-72-2	0.08	0.25	0.088	0.5
3-Nitrotoluene	99-08-1	0.07	0.25	0.057	0.5
4-Amino-2,6-dinitrotoluene	19406-51-0	0.02	0.25	0.05	0.15
4-Nitrotoluene	99-99-0	0.08	0.25	0.088	0.5
HMX	2691-41-0	0.03	0.25	0.036	0.15
Nitrobenzene	98-95-3	0.05	0.25	0.05	0.15
Nitroglycerin	55-63-0	0.13	0.5	0.33	1.5
PETN	78-11-5	0.16	0.5	0.3	1.5
RDX	121-82-4	0.04	0.25	0.036	0.15
Tetryl	479-45-8	0.05	0.25	0.05	0.15
Nitroguanidine (8330 modified)	556-88-7	0.02	0.25	2.4	20
Perchlorate (6860)	14797-73-0	0.15	5	0.082	0.5
Nitrocellulose (353.2)	9004-70-0	0.78	5	0.475	2

[a] Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

Table 4-5

Target Analyte List (TAL) ICP Metals - Methods 6010 DoD

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit[a]	Method Detection Limit	Reporting Limit[a]
		mg/Kg		ug/L	
Aluminum	7429-90-5	5.6	20	48	200.0
Antimony	7440-36-0	0.94	3	9.8	30.0
Arsenic	7440-38-2	1.3	4	12.0	40.0
Barium	7440-39-3	0.2	2	2.5	20.0
Beryllium	7440-41-7	0.03	0.3	0.3	3.0
Cadmium	7440-43-9	0.03	0.3	0.5	3.0
Calcium	7440-70-2	10	50	100.0	500.0
Chromium	7440-47-3	0.14	1	2.0	10.0
Cobalt	7440-48-4	0.25	1	3.0	10.0
Copper	7440-50-8	0.22	1.5	2.1	15.0
Iron	7439-89-6	2	10	20.0	100.0
Lead	7439-92-1	0.26	1	2.5	10.0
Magnesium	7439-95-4	4.5	50	40.0	500.0
Manganese	7439-96-5	0.25	1	2.5	10.0
Mercury	7439-97-6	0.0086	0.04	0.1	0.25
Nickel	7440-02-0	0.24	1	2.4	10.0
Potassium	7440-09-7	10	100	93.0	1000
Selenium	7782-49-2	1.4	4	13.0	40.0
Silver	7440-22-4	0.09	0.5	0.84	5.0
Sodium	7440-23-5	20	100	250.0	1000
Thallium	7440-28-0	0.84	3	9.0	30.0
Vanadium	7440-62-2	0.19	2	1.9	20.0
Zinc	7440-66-6	0.4	2	3.0	20.0

a Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

4.4 Completeness, Representativeness, and Comparability

Completeness, representativeness and comparability goals identified in Section 4.3 and Tables 4-1 and 4-2 of the FWQAPP will be imposed for this investigation.