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FINAL ACCIDENT PREVENTION PLAN FOR ADDITIONAL PCB SOURCE DELINEATION  
SAMPLING, ROCK CORING AND SEDIMENT TRAP INSTALLATION AT SOLID WASTE  
MANAGEMENT UNIT 17 ( SWMU 17) PCB CAPACITOR BURIAL POLE YARD NSA CRANE  
IN  
05/01/2015  
TETRA TECH INC

**FINAL  
ACCIDENT PREVENTION PLAN**

**FOR**

**ADDITIONAL PCB SOURCE DELINEATION SAMPLING,  
ROCK CORING,  
AND  
SEDIMENT TRAP INSTALLATION  
AT  
SWMU 17  
PCB CAPACITOR BURIAL/POLE YARD  
NAVAL SUPPORT ACTIVITY (NSA) CRANE  
CRANE, INDIANA**

**Prepared for:**

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**Submitted by:**

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**Prepared under:**

**Contract No. N62470-08-D-1008  
Contract Task Order F270**

**Revision 0  
May 2015**

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## ATTACHMENTS

I	Site-Specific Training Documentation Form and Employee Training/Qualifications/Medical Clearance
II	Utility Locating and Excavation Clearance Standard Operating Procedure
III	Equipment Inspection Checklist
IV	OSHA Poster

## Acronyms

§	Section
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
BBP	Blood borne Pathogen
BG	Background
BLS	Bureau of Labor Statistics
C	Centigrade or Celsius
CESCO	Certified Environmental and Safety Compliance Officer
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long - Term Environmental Action Navy
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
TO	Task Order
DART	Days Away/Restricted Duty/Transfer
dB	decibels
DEET	n,n-diethyl-meta-toluamide
DOD	Department of Defense
DOT	Department of Transportation
EM	Engineer Manual
EPA	Environmental Protection Agency
F	Fahrenheit
FOL/SSHO	Field Operations Leader/Site Safety and Health Officer
FSP	Field Sampling Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDW	Investigative Derived Waste
IM	Interim Measures
lbs	pounds
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligrams per cubic meter
mm	millimeter
NAICS	North American Industry Classification System

NRR	Noise Reduction Rating
NSA	Naval Support Activity
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PCB	Polychlorinated Biphenyl
PHSO	Project Health and Safety Officer
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
RAC	Risk Assessment Code
RCIR	Recordable Case Incident Rate
RPM	Remedial Project Manager
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
TSS	Technical Support Services
TP	Technical Paper
TWA	Time-Weighted Average
USACE	United States Army Corps of Engineers

### 1.0 SIGNATURE SHEET

By their signature, the undersigned hereby certify that this Accident Prevention Plan (APP) has been prepared in accordance with the United States Army Corps of Engineers (USACE) Engineering Manual (EM) 385-1-1 (15 September 2008 version), and has been reviewed and approved for use during field operations at Naval Support Activity (NSA) Crane, Indiana.

Approved by:

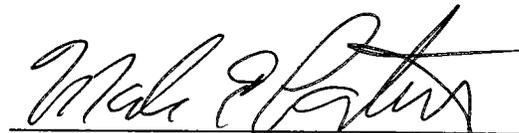
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5-29-15  
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Signature

5/28/15  
Date

## **2.0 BACKGROUND INFORMATION**

### **2.1 CONTRACTOR**

Tetra Tech, Inc. (Tetra Tech) will conduct the field activities identified in this Accident Prevention Plan (APP).

### **2.2 CONTRACT NUMBER**

This work is authorized under the Comprehensive Long - Term Environmental Action Navy (CLEAN) contract, administered through the Naval Facilities Engineering Command, Mid-Atlantic (NAVFAC), as defined under Contract No. N62470-08-D-1008; Contract Task Order (CTO) F270.

### **2.3 PROJECT NAME**

Field Investigation at the Polychlorinated Biphenyl (PCB) Capacitor Burial/Pole Yard, SWMU 17

### **2.4 PROJECT DESCRIPTION**

This APP covers this RCRA Phase III Facility Investigations to determine the nature and extent of PCB contamination at SWMU 17.

### **2.5 LOCATION**

NSA Crane is located in a rural, sparsely populated region of south-central Indiana, approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky immediately east of NSA Crane Village and Burns City. SWMU 17 is located in the north-central portion of NSA Crane. See Figure 2-1.

### **2.6 PHASES OF WORK REQUIRING ACTIVITY HAZARD ANALYSIS (AHA)**

The specific tasks anticipated to be involved with this effort are listed below:

- Mobilization/Demobilization
- Surface and subsurface soil sampling and soil/bedrock boring via:
  - Direct Push Technology (DPT)
  - Portable gasoline powered drill
  - Hand auguring

- Trench Excavation
  - Sediment trap (check dam) installation
- Decontamination of sampling and excavation equipment
- IDW management
- Vault/Pipeline CCTV Survey and Smoke Test
- Surveying via Global Positioning System (GPS)
  - Vegetation Management

### 3.0 STATEMENT OF SAFETY AND HEALTH POLICY

Tetra Tech is committed to providing our employees with a safe and healthful workplace. It is the goal of Tetra Tech to continue excellent safety performance on NAVFAC contracts to support the Navy in their safety efforts. Specifically, Tetra Tech will perform work in a manner that is consistent with the Zero Incident Philosophy. It is our goal to plan and perform the work in a manner that integrates safety and health considerations so that worker injuries or illnesses, environmental releases/impacts, or property damage are eliminated. In addition to the line and staff management functions described in this APP, each individual performing work under this contract has the responsibility for his/her own personal health and safety, as well as for assisting in assuring the health and safety of co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that employees “recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees.” This employee responsibility includes observing specified health and safety requirements and communicating with the designated Field Operations Leader on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee’s failure to adhere to the requirements of this APP, or to observe specified safety requirements and restrictions, or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and reporting of hazards.

This APP establishes the requirements that the Site Safety and Health Officer (SSHO) must follow to respond to changing conditions by knowing when to stop work and call for additional guidance from a Certified Industrial Hygienist (CIH)/Certified Safety Professional (CSP). The Project Health and Safety Manager (PHSM) will provide the SSHO with additional information, or request additional information, in order to fully evaluate the situation. This type of communication provides the SSHO with the necessary support and knowledge to equip the workers with the required protection either through adjustment to the work procedures, or through additional techniques, tools, or equipment. Personal protective equipment (PPE) may be altered to provide additional protection to the workers, based on the information provided by the SSHO to the PHSM. This APP also delineates health and safety responsibilities and assigns those responsibilities to project and office personnel.

**3.1 TETRA TECH SAFETY STATISTICS**

Table 3-1 presents safety statistics for Tetra Tech for the last 3 calendar years compared to the national averages for our industry. This comparison uses data collected by the United States Department of Labor, Bureau of Labor Statistics (BLS) for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

**TABLE 3-1  
 COMPARISON OF TETRA TECH AND 2011 BLS DATA FOR  
 NAICS CODE 541 (TRIR AND LWDIR CASE RATES)**

	<b>NAICS 541620 Professional and Business Services 2013</b>	<b>Tetra Tech 2012</b>	<b>Tetra Tech 2013</b>	<b>Tetra Tech 2014</b>
<b>Total Recordable Incident Rate (TRIR)</b>	1.00	0.67	0.69	0.51
<b>Lost Workday Incident Rate (LWDIR)</b>	0.40	0.10	0.15	0.12

The data comparison illustrates that Tetra Tech’s performance compares favorably with the most-recent national averages for the environmental engineering and hazardous waste services industries. Raw data for these statistics can be found in the Occupational Safety and Health Administration (OSHA) Form 300A attached as Figure 3-1.

**Tetra Tech Man Hours Worked**

2012	24,904,295
2013	24,812,849
2014	23,586,978

**Tetra Tech Experience Modification Rates (Policy Year October 1 - September 30):**

2011-2012	0.76
2013-2014	0.80
2014-2015	0.83

## **4.0 RESPONSIBILITIES AND LINES OF AUTHORITY**

### **4.1 STATEMENT OF RESPONSIBILITY**

Tetra Tech, as the employer for staff that will be engaged in performing the work presented in this APP, fully recognizes and accepts ultimate responsibility for protecting the safety and health of our employees, and for the implementation of an effective Safety and Occupational Health program. No person shall be required or instructed to work in surroundings or under conditions that are unsafe or dangerous to his or her health. Each employee is responsible for complying with applicable safety and occupational health requirements, wearing prescribed safety and health equipment, reporting unsafe conditions/activities, preventing avoidable accidents, and working in a safe manner.

### **4.2 IDENTIFICATION AND ACCOUNTABILITY**

This section defines responsibility for safety and health for Tetra Tech employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

#### **4.2.1 Navy Personnel**

The Navy personnel primarily responsible for this project are Ms. Linda Cole who is the Remedial Project Manager (RPM) and Mr. Thomas Brent who is the Facility Point of Contact (POC).

#### **4.2.2 Tetra Tech Personnel**

##### **4.2.2.1 Project Manager– Thomas E. Johnston, PhD**

The Tetra Tech PM is responsible for the overall direction and implementation of health and safety for this work. The PM coordinates closely with the RPM who is responsible to oversee the project implementation, including scoping, data review, and evaluation. This includes the responsibility for ensuring that:

- Work is appropriately planned and executed in accordance with contractual, regulatory, and internal requirements
- Adequate resources (including personnel, equipment, and supplies) are assembled, and made available to the FOL/SSHO to safely and effectively accomplish the work.
- Ensure implementation of this APP through coordination with the HSM, and the PHSM, as applicable.
- Conduct periodic inspections.

- Participate in the incident investigations.
- Ensure APP has the required approvals before any site work is conducted.
- Ensure that the PHSM and HSM are informed of project scope changes that require modifications of the APP.
- Assume overall project responsibility for health and safety.
- Ensure that adequate resources are provided to the field staff to carry out their responsibilities as outlined below.

Dr. Johnston has 37 years of professional experience in the environmental field. He has managed and participated in numerous environmental investigations for the United States Department of Energy and the United States Department of Defense. He has also served as corporate and contract quality assurance (QA) managers (QAMs) at various times throughout his career. His investigations have included projects at Los Alamos, New Mexico; the Hanford Reservation in Hanford, WA; the Naval Industrial Reserve Ordnance Plant in Fridley, MN; the Portsmouth Naval Shipyard in Kittery, ME; the Naval Support Activity (NSA) Crane in Crane, IN; the Naval Support Activity Panama City in Panama City Beach Florida, and the Naval Air Station Jacksonville in Jacksonville, FL; and numerous others. These investigations have included chemical, radiochemical, or chemical warfare agent contaminants. As a project manager he ensures that environmental investigations are safely completed within budgetary and schedule constraints to the satisfaction of clients and that regulatory requirements are satisfied. His training certifications include:

- OSHA 1910.120 24-hr OSHA Hazardous Waste Operations and Emergency Response Training, 1999
- Data Quality Objectives Training, USEPA Region VI, 1994
- Quality Management Plan/Quality Assurance Project Plan Training, USEPA Region VI, 1994
- 8 Hour Refresher 29 CFR 1910.120 OSHA Refresher, annually, 2014

#### **4.2.2.2 Health and Safety Manager – Matthew Soltis, CIH, CSP**

The HSM is responsible for the development and administration of the company health and safety program. The HSM will act in an advisory capacity to PM and site personnel for project-specific health and safety issues. The Tetra Tech PM will establish a liaison between the RPM and the HSM on matters relating to health and safety. In the fulfillment of the duties of this position, the HSM will enlist the support of safety and occupational health professionals, as appropriate. The HSM is responsible for the following actions:

- Developing, maintaining, and overseeing implementation of this APP
- Visiting project sites as needed to audit the effectiveness of the APP
- Remaining available to respond to project emergencies
- Developing modifications to the APP, as needed

- Evaluating occupational exposure monitoring/air sampling data and adjusting APP as necessary
- Serving as a Quality Control staff member
- Approving the APP by signature

Mr. Soltis is an occupational safety, health and security professional with over 30 years of professional experience. He is dual-certified in comprehensive practice for both occupational safety and industrial hygiene (CSP and CIH) and he has achieved national recognition in his areas of expertise by the American Industrial Hygiene Association, and has been elected as a Fellow of that organization. He has provided technical and management services to a wide diversity of clients both in the United States and overseas. This experience has involved numerous industries including manufacturing, construction, chemical processing, energy generation/transmission, R&D, and environmental sectors. Mr. Soltis has also served as Adjunct Professor for the Indiana University of Pennsylvania Safety Sciences Department, teaching course work in the fields of safety engineering and industrial hygiene.

The work under this contract, including this field effort, is subject to a comprehensive health and safety program developed, designed, and implemented by Mr. Soltis. Mr. Soltis serves as Corporate Manager of Health and Safety for Tetra Tech Technical Support Services (TSS) and as the HSM for the planned work addressed in this APP. He training experience includes:

- 40-Hour HAZWOPER Training, 29 CFR 1910.120 OSHA, 1988
- 8 Hour Refresher 29 CFR 1910.120 OSHA Refresher, annually, 2014
- 8-Hour Supervisory Training, 29 CFR 1910.120 OSHA, 1990
- OSHA 10-hour Construction Safety Training #31-003300669
- FEMA IS-200 ICS for Single Resources and Initial Action Incidents. June, 2009

#### **4.2.2.3 Project Health and Safety Officer – James K. Laffey, CESCO**

The PHSO is responsible for developing this APP in accordance with applicable OSHA and USACE EM 385 1-1 regulations. Specific responsibilities include:

- Providing information regarding site contaminants and physical hazards associated with the site
- Establishing air monitoring and decontamination procedures
- Assigning personal protective equipment based on task and potential hazards
- Determining emergency response procedures and emergency contacts
- Stipulating training requirements and reviewing training and medical surveillance certificates
- Providing standard work practices to minimize potential injuries and exposures
- Modifying this APP, as necessary

Mr. Laffey has served as a PHSO for a wide variety of Environmental Investigation/Remediation Projects for USACE since 1993. He is a certified Environmental and Safety Compliance Officer (CESCO) #464375803 by the National Registry of Environmental Professionals. His experience involves CERCLA investigations, remedial action projects, and baseline characterization studies (estimated at over 100 different projects). In this capacity, he is responsible for identifying site chemical and physical hazards and developing the site-specific APP, providing technical guidance to field personnel to control or minimize site hazards. He is a certified instructor for all the OSHA HAZWOPER training programs including the 40-hour initial training, 8-hour supervisory training, and 8-hour annual refresher training. He is certified by the FEMA and the USEPA as an Incident Command System Instructor for IS 100 through 400. His training experience includes:

- OSHA Construction Safety and Health 30-hour Training #36-60070909, 2010
- OSHA 29 CFR 1910.120 40-hour HAZWOPER Training, 1990
- OSHA 29 CFR 1910.120 8-hour Annual Refresher Training 2015
- OSHA 29 CFR 1910.120 Supervisory 1991 and Refresher Training 2015
- Safety in Excavation Training Course, 2002
- American Red Cross, First Aid and CPR/AED 2010

#### **4.2.2.4 Field Operations Leader/Site Safety Officer (FOL/SSHO) – James Goerd**

The FOL/SSHO is responsible for implementation of the project work plans in accordance with the APP, with the assistance of the FOL/SSHO. The FOL manages field activities, executes the SAP, and enforces safety procedures as applicable to the SAP. Other duties include:

- Ensuring that the proper notifications are made prior to beginning work
- Verifying training and medical clearance of onsite personnel status in relation to site activities
- Selecting, applying, inspecting, and maintaining personal protective equipment
- Implementing Hazard Communication, Respiratory Protection Programs, and other health and safety programs as needed
- Providing site-specific training for onsite personnel
- Investigating accidents and injuries

Mr. Goerd has over 20 years of professional environmental experience in both the government sector and private industry. He has experience with Department of Defense (DoD) munitions response program (MRP) project management and execution. Mr. Goerd has conducted numerous on-site facility compliance inspections at a wide range of facilities. He has performed multimedia environmental sampling, including

surface water, groundwater, soils, sediments, and air. He is an experienced professional in the preparation of technical/cost proposals for environmental scopes of work; preparation of project quality control guidelines/specifications and quality assurance plans. He has experience in writing field reports, quality assurance project plans, and other investigative documents. Mr. Goerdt has coordinated the preparation of environmental permitting and investigation project documents which include RCRA air quality assessments, quality assurance project plans, RCRA facility investigation reports, and RCRA air permits, including development of graphics and figures, data analysis and interpretation. He also has experience in waste characterizations and air sampling techniques. He has experience with well purging techniques; sample collection, documentation, packaging, and shipping; decontaminating procedures; sampling protocols; and technical report writing. He has experience in the preparation of Phase I site assessment reports.

Mr. Goerdt has experience in the use of various field monitoring equipment such as multi-parameter water quality meters, turbidity meters, PIDs and FIDs, as well as equipment calibration and maintenance. He has experience in the use of field X-Ray Fluorescence (XRF) analyses. He has experience in the use of Global Positioning Systems (GPS) in the field to both locate sample locations and map sample locations and features. He has experience utilizing the SDI Rapid Assay field test kit for PCBs. His training and certifications include:

- OSHA 1910.120 40-Hour HAZWOPER Training, December 2012
- OSHA 1910.120 8-Hour HAZWOPER Refresher, 2014
- OSHA Construction Safety and Health 30-hour Training #36-600801274, 2011

As the Site Safety Officer the FOL/SSHO is also responsible for ensuring that corrective measures have been implemented, appropriate internal and NSA Crane authorities have been notified, and follow-up reports have been completed. These duties may include the following:

- Select, inspect, implement, and maintain personal protective equipment
- Establish work zones and control points
- Implements air-monitoring program for onsite activities
- Verify training and medical status of onsite personnel status in relation to site activities
- Coordinate emergency services
- Provide site specific training for onsite personnel
- Investigate accidents and injuries
- Developing and maintaining current chemical inventories and Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) files for hazardous chemicals that will be used/stored at that workplace

- Ensuring that onsite personnel who may use hazardous chemicals have access to and review pertinent Safety Data Sheets (SDSs) prior to using or dispensing such chemicals
- Ensuring compliance with container labeling requirements
- Providing input to the PHSO regarding the need to modify this APP or other health and safety documents as per site-specific requirements

Compliance with the requirements stipulated in this APP is monitored by the FOL/SSHO and coordinated through the PHSO and HSM. The FOL/SSHO must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed. The FOL/SSHO is also responsible for informing the RPM of major incidents and associated corrective actions.

#### **4.2.2.5 Site Personnel - Various**

In addition to the line and staff management functions, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that "each employee recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees." This employee responsibility includes observing specified health and safety requirements and communicating with the designated FOL/SSHO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues. Site Personnel are responsible to:

- Report any unsafe or potentially hazardous conditions to the FOL/SSHO.
- Report injuries, illnesses, spills, fires, and property damage to the FOL/SSHO.
- Maintain knowledge of the information, instructions, and emergency actions contained in this APP.
- Comply with rules, regulations, and procedures set forth in this APP and any revisions that are instituted.
- Initiate the Incident Report when involved in an incident/accident if able to do so.
- Inspect the tools and equipment, including PPE, daily prior to use.
- Conduct daily operations check of electronic equipment and annotate in the team logbook.
- Assist the FOL/SSHO with implementation and compliance with the APP

#### **4.2.2.6 Subcontractors and Suppliers**

Tetra Tech directs the subcontractor's supervisor regarding the work and the manner in which tasks are to be performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained and are in compliance with applicable regulations; and allocating

sufficient time, materials, and equipment to safely complete activities in accordance with this APP and their individual Environmental Health and Safety plans. Subcontractors will attend the Tetra Tech daily health and safety meeting prior to starting field work.

- Individuals employed by subcontractors/vendors will receive:
  - Site-specific briefing regarding the hazards present on the work site
  - Required safety activities
  - Individual roles and responsibilities for safety practices
- While on site subcontractors/vendors will be under the direct supervision of the FOL/SSHO.

#### **4.3 STOP WORK AUTHORIZATION**

ALL employees are empowered, authorized, and responsible to STOP WORK at any time when an imminent and uncontrolled safety or health hazard is perceived. In a Stop Work event (immediately after the involved task has been shut down and the work area has been secured in a safe manner) the employee shall contact the PM and the Corporate Health and Safety Manager. Through observations and communication, all parties involved shall then develop, communicate, and implement corrective actions necessary and appropriate to modify the task and to resume work.

#### **4.4 COMPETENT AND QUALIFIED PERSON(S)**

The competent and qualified person for this project is Mr. James Goerd. His resume and qualifications are listed in Section 4.2.2.5. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate or control these hazards and conditions. The FOL/SSHO has five years of field experience in environmental sampling, and safety and has detailed knowledge of and experience in air sampling situations.

#### **4.5 REQUIREMENT OF DESIGNATED COMPETENT PERSON ON SITE**

Work tasks at SWMU 17 will only be performed when the designated competent person is physically on the job site.

#### **4.6 REQUIREMENTS OF PRE-TASK SAFETY AND HEALTH ANALYSIS**

The FOL/SSHO will conduct daily pre-shift tailgate safety meetings discussing the planned site activities, the hazards associated with each task, and the training required of personnel involved in these tasks. The

related personal protective equipment or related work equipment will be inspected by the competent/qualified person before any work is started.

Tetra Tech requires that an Activity Hazard Analysis (AHA) be prepared for each job task to be performed at this site to identify hazards before they occur and provide mitigation measures. The AHAs focus on the relationship between the worker, the task, the tools, and the work environment. The AHAs are reviewed at the tailgate safety meeting at the beginning of each work day. These sessions inform each person of the potential hazards for each task and provide steps to take to eliminate or reduce hazards to an acceptable risk level. The AHAs are presented in the Section 10.0.

Personnel will be encouraged to report to the FOL/SSHO any conditions or practices that they consider detrimental to their health or safety, or those they believe violate applicable health and safety standards. Such reports may be made orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment are encouraged to bring the matter to the immediate attention of the FOL/SSHO for resolution. Job site activities presenting danger to life or limb should be stopped immediately and reported to the FOL/SSHO for resolution. Near miss incidents are to be reported to the FOL/SSHO who will record the information in the site logbook and in the Tetra Tech TOTAL System.

At least one copy of this APP will be available to site personnel. Each vehicle used on the job site will contain a copy of the APP to ensure quick and easy access by employees. In addition to a review of the AHAs, minor changes and any other relevant topics will be discussed by the FOL/SSHO at the daily tailgate safety meeting. However, significant revisions must be discussed with the HSM and PM and approved prior to implementation.

It is the goal of Tetra Tech to continue its excellent safety performance on USACE contracts. Specifically, Tetra Tech will perform the work in a manner that is consistent with the Zero Incident Philosophy. In accordance with this philosophy, it is our stated goal to plan and perform the work in a manner that integrates safety and health considerations so that it is accomplished without experiencing any worker injuries or illnesses, environmental releases/impacts, or property damage events.

#### **4.7 LINES OF AUTHORITY**

Personnel who will be working on this project are covered by this APP. These documents shall be rigorously enforced during this field effort. Violators of the APP will be verbally notified upon first violation, and the violation will be noted by the FOL/SSHO in the field logbook. Upon second violation, the violator will be notified in writing, and the Tetra Tech PM and the violator's supervisor will be notified. A third violation will result in a written notification and the violator's eviction from the site. The written notification will be sent to the human resources department and the HSM.

Any violations that are deemed to be serious, intentional, or otherwise egregious will be subject to immediate corrective action, up to and including removal from the site, and will not require adherence to this progressive, three-step disciplinary process.

In the Tetra Tech Health and Safety Program Summary, it is stated by the company Chief Executive Officer Mr. Daniel L. Batrack, "Management is responsible for ensuring that all aspects of the workplace, including offices and project locations, are safe and that any risks, hazards, and safety violations are brought to their attention, investigated, and corrected promptly. Tetra Tech's associates are responsible for complying with the H&S policy, programs and standards, and conducting their work safely and without detriment to themselves, other employees, other individuals or property.

Compliance with this policy is mandatory. Willful violation or negligent disregard of this policy will be considered cause for disciplinary action up to and including termination."

#### **4.7.1 Policies and Procedures Regarding Noncompliance**

An employee's failure to adhere to the requirements of this Accident Prevention Plan, the Project Specific Work and Safety Plans, or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

#### **4.7.2 Manager and Supervisor Accountability**

The purpose of the Tetra Tech corporate Health and Safety Program is to define the health and safety standards required on a corporate wide basis. The corporate Health and Safety Program applies to all Tetra Tech employees and sets forth minimum requirements for subcontractors working under contract to Tetra Tech. The responsibilities, organizational structure, recordkeeping requirements, and evaluation of Tetra Tech's corporate Health and Safety Program are outlined in detail in the Program Administration and Organizational Structure document:

- Senior Vice President of Administration has overall responsibility for the Tetra Tech corporate Health and Safety Program.
- Corporate Health and Safety Director
- Operational Unit Health and Safety Managers individuals assigned to health and safety administration within each Tetra Tech operating unit
- Operations Managers individuals who manage an office(s) within an operating unit of Tetra Tech

- Office Health and Safety Representative who is assigned to health and safety program-related functions within an office or long-term project location
- Project Managers who are responsible for managing a particular project or job.
- Site Safety Coordinators who provide health and safety oversight for a particular project site.
- Field personnel who are required to participate in appropriate health and safety programs and maintain their field-ready status.
- Each and every employee of Tetra Tech is responsible for upholding the standards established by the company.

An organization chart depicting the lines of authority is included as Figure 4-1.

**5.0 SUBCONTRACTORS AND SUPPLIERS**

Tetra Tech will employ subcontractors in the performance of work covered by this APP. Subcontractor personnel are required to read and comply with the sections of this Tetra Tech APP. The subcontractor personnel entering the site must sign the Site-Specific Training Documentation form included in the APP and the individual AHAs included in the APP.

**5.1 IDENTIFICATION**

The principal subcontractors for various scopes of work during projects conducted under this CTO are detailed below:

Subcontractor: TBD  
Assignment  
Address:  
Telephone:  
Project Contact:

Subcontractor: TBD  
Assignment:  
Address:  
Telephone:  
Project Contact:

**5.2 SAFETY RESPONSIBILITES OF SUBCONTRACTORS AND SUPPLIERS**

Subcontractor personnel must comply with the applicable 29 CFR 1910.120 training and medical surveillance requirements. Subcontractors are responsible for providing PPE needed to protect personnel as specified by their safety and health planning documents and by this APP, and are directly responsible for assuring the health and safety of their employees. Subcontractors who have not met OSHA training, medical surveillance, and PPE requirements are not permitted to enter areas where exposure to hazardous materials is possible.

This APP shall be rigorously enforced during this field effort. Subcontractor personnel who violate the APP will be verbally notified upon first violation and the violation will be noted by the FOL/SSHO in a field logbook. Upon second violation, the violator will be notified in writing, and the Tetra Tech PM and the violator’s supervisor will be notified. A third violation will result in a written notification and the violator’s

eviction from the site. The written notification will be sent to the Subcontractor, Tetra Tech Contracts Department, and the HSM.

Enforcement of violations of the APP and AHAs is conducted by the FOL/SSHO during remedial actions. Tetra Tech will monitor the work practices of its subcontractor workers onsite, and unequivocally enforce all aspects of the AHAs. Subcontractors are responsible for enforcing all health and safety policies applicable to site activities on this project. Disciplinary action will be enforced against the subcontractor manager and personnel for noncompliance violations.

**NOTE:** Any violations that are deemed to be serious, intentional, or otherwise egregious will be subject to immediate corrective action, up to and including removal from the site.

## **6.0 TRAINING**

Personnel who may be exposed to hazardous conditions and who will participate in site activities are required to meet the training requirements outlined in 29 CFR §1910.120, HAZWOPER. Furthermore, site personnel must satisfy any specialized training requirements that are presented in the AHAs for tasks to be completed on this project. Health and safety-related information will be communicated to employees through meetings, postings, written communications, and reporting of hazards.

### **6.1 NEW HIRE HEALTH AND SAFETY ORIENTATION**

Tetra Tech requires all new employees to attend orientation training which includes a review and sign off on the Employee Handbook. This employee handbook is a general guide to various personnel policies including the Health and Safety Program and employee benefits of Tetra Tech. Each new hire is required to view a video that explains basic safety policies at Tetra Tech. Prior to working in the field on their own they are required to spend a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.

### **6.2 MANDATORY TRAINING AND CERTIFICATIONS**

Tetra Tech personnel qualification and training certification documentation will be obtained by the PM and included in Attachment I and maintained on-site. Mandatory training and certifications applicable to this project include the following:

- 40 hours of introductory hazardous waste site training prior to performing work at SWMU 17.
- 8 hours of refresher training within the past 12 months before being cleared for site work. (Field personnel who have had introductory training more than 12 months prior to site work must complete this training again).
- 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site personnel operating in a supervisory capacity.

Documentation of Tetra Tech introductory, supervisory, and refresher training as well as site-specific training, will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement.

### 6.3 SITE-SPECIFIC SAFETY AND HEALTH TRAINING

The FOL/SSHO will provide site-specific training to Tetra Tech employees who will perform work on this project. In addition, a brief meeting will be held at the beginning of each day to discuss operations planned for that day and to review the appropriate AHAs with the planned task participants. Based on field activities, a short meeting may also be held at the end of the day to discuss the operations completed and any problems encountered.

Prior to accessing active work areas of the sites or participating in any intrusive activities, site personnel and visitors will first be required to undergo a site-specific safety and health training session conducted by the FOL/SSHO, which will include a review of the APP and signing of the Site-Specific Training Documentation form.

Before site activities begin, the Tetra Tech FOL/SSHO will present a briefing for site personnel who will participate in on-site activities. The following topics will be addressed during the pre-work briefing:

- Names of the personnel listed in the organizational chart and designated alternates
- Site history
- Work tasks
- Hazardous chemicals that may be encountered
- Physical hazards that may be encountered
- PPE, including types of respiratory and hearing protection to be used for work tasks
- Mandatory training and certification requirements (e.g., HAZWOPER, first aid, etc.)
- Environmental surveillance (air monitoring) equipment use and maintenance
- Action levels and situations requiring an upgrade or downgrade of level of protection
- Site control measures including site communications and control zones
- Decontamination procedures
- Emergency communication signals and codes, including incident reporting procedures
- Environmental accident/emergency procedures
- Personnel exposure and accident emergency procedures
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes

Any other health and safety-related issues that may arise before site activities begin will be covered during the pre-work briefing.

#### **6.4 HAZARD COMMUNICATION TRAINING**

In accordance with the OSHA Hazard Communication Standard (29 CFR 1920.1200 and 29 CFR 1926.59), copies of SDSs for hazardous chemical materials that are used during site operations or that may be present on site will be available on site from the SSHO. The SSHO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1920.1200 and 29 CFR 1926.59, EM 385 1-1, and the HAZCOM program. Training will include, but is not be limited to, the hazards or potential hazards associated with work activities, and any hazardous chemical materials brought to on the site.

#### **6.5 FIRST AID AND CARDIO PULMONARY RESUSCITATION TRAINING**

The FOL/SSHO will identify those individuals who have current first aid and cardiopulmonary resuscitation (CPR) training. At a minimum two people including the SSHO will be current in CPR/first aid. The names of all CPR/first aid-qualified workers will be posted on the site bulletin board and will be added to this APP when the project starts.

#### **6.6 BLOODBORNE PATHOGENS TRAINING**

Individuals on site who have first aid and CPR certification and who may provide emergency medical treatment shall have completed training in accordance with the Tetra Tech Blood borne Pathogens Program and OSHA Blood borne Pathogen Standard, 29 CFR 1910.1030. The Hepatitis B Vaccine Declination (mandatory) (in the event of accidental needle stick or other exposure to blood during first aid, etc.) will be one of the topics covered in the site orientation training in accordance with 29 CFR 1910.1030.

#### **6.7 TRAINING DOCUMENTATION**

Attachment I (Site Specific Training Documentation) documents the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities. This training documentation identifies personnel who, through record review and attendance of the site-specific training, are cleared for participation in site activities. This document shall be maintained at the site to identify and maintain an active list of trained and cleared site personnel.

#### **6.8 PERIODIC SAFETY AND HEALTH TRAINING**

Tetra Tech supervisors and employees are required to maintain their training and certifications and participation in the medical surveillance program required for field work. This is accomplished throughout the year by attending classroom sessions, taking on-line instruction, participating in webinars, attending

professional conferences and obtaining annual or bi-annual physical examinations. In addition to other corporate training Tetra Tech requires all employees to review and sign off on the Employee Handbook bi-annually which contains the Corporate Health and Safety Program.

## **6.9 EMERGENCY RESPONSE TRAINING**

Tetra Tech personnel who are involved in emergency response activities are required to attend and maintain their certifications.

## **7.0 SAFETY AND HEALTH INSPECTIONS**

It is Tetra Tech's internal policy that the job sites involving work for NAVFAC are subject to audits by corporate safety staff.

### **7.1 SPECIFIC ASSIGNMENT OF RESPONSIBILITY FOR A MINIMUM DAILY JOB SITE SAFETY AND HEALTH INSPECTION DURING PERIODS OF WORK ACTIVITY**

The Tetra Tech FOL/SSHO will conduct safety and health inspections during this field effort to ensure safe work areas and compliance with the APP.

#### **7.1.1 Proof of Inspector's Training/Qualifications**

See Section 4.2.2.2

#### **7.1.2 Inspection Frequency**

Daily site safety inspections shall be conducted by the FOL/SSHO

#### **7.1.3 Documentation Procedures**

The FOL/SSHO will record any deficiencies in the Field Log Book that is maintained onsite for the site practices.

#### **7.1.4 Deficiency Tracking System and Follow-up Procedures**

The items noted during field audits will be communicated to the Tetra Tech HSM who maintains a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution.

Results from field audits are also regularly communicated throughout Tetra Tech through training and electronic means as a method of continuous program improvement. The FOL/SSHO will follow up on deficiencies to ensure that they are resolved.

#### **7.1.5 External Inspections/Certifications**

The Tetra Tech HSM or a designated representative may conduct an unannounced inspection during this project.

## **8.0 ACCIDENT REPORTING**

When an incident occurs, the FOL/SSHO will verbally notify the PM. If the incident is an injury requiring more than first aid or property damages exceeding \$2,000 the PM will immediately notify the RPM.

### **8.1 EXPOSURE DATA**

If required by the RPM, the FOL/SSHO will calculate exposure data on a monthly basis. Man-hours worked are obtained from hours charged to a project for payroll purposes.

### **8.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS**

Accidents or incidents, as well as near-miss events, are to be reported within 24 hours by either completing the written event report form or using the Tetra Tech web-based incident reporting process. Within five working days, a complete investigation report must be submitted to the RPM.

Tetra Tech employees have been educated that prompt and accurate reporting of any incidents they encounter is one of their personal health and safety responsibilities. On this project, the FOL/SSHO are responsible for assuring that the incidents and serious near miss events are reported via the Tetra Tech TOTAL incident reporting system. The HSM is responsible for assuring that the incidents and serious near-miss events are adequately investigated. The HSM is also responsible for collecting, tracking, and trending incident data (e.g., recordable cases, employee hours worked, etc.). Accidents involving near misses, injuries, or illnesses must be immediately reported to the PM and the HSM, and documented on the Tetra Tech Incident Report form provided at the end of this section.

Hazardous work conditions or unsafe work practices will be corrected in a timely manner, both in the field and in the office. Upon discovery of an unsafe condition at a field site, the degree of hazard must be assessed. Action may range from complete shutdown of the operation to phased correction.

The Tetra Tech employees working on this project have "Stop Work" authority in the event that a potentially serious action or condition is observed. Tetra Tech will shut down a project during which life threatening, severe environmental impact, or significant equipment or property damage conditions may exist. Employees shall follow specific information for emergency evacuation and PPE usage as described in this APP.

### **8.3 IMMEDIATE NOTIFICATION OF MAJOR INCIDENTS**

Any occupational incidents meeting the definitions presented below that occur on this project will be immediately reported to the RPM as soon as possible, but not later than 24 hours from the time of the event. Incidents that must be reported include those that result in any of the following:

- Fatalities
- Permanent total disability
- Permanent partial disability
- Hospitalization of 3 or more people resulting from a single occurrence
- Property damage of \$200,000 or more

With consultation with the PHSO, the FOL will coordinate with the Tetra Tech PM in making any such notifications to the RPM.

### **8.4 INCIDENT REPORTING PROCEDURES**

Following the prescribed incident reporting procedure is necessary for documenting the information obtained at the time of the incident.

#### **8.4.1 TOTAL Incident Reporting System**

TOTAL is Tetra Tech's new online incident reporting system. Site employees can use TOTAL to directly report health and safety incidents, notify key personnel, and initiate the process for properly investigating and addressing the causes of incidents, including near-miss events.

An incident is considered any unplanned event. It may include several types of near misses, events where no loss was incurred, or incidents that resulted in injuries or illness, property or equipment damage, chemical spills, fires, or damage to motor vehicles. Some examples of incidents are as follows:

- Work-related injury or illness
- Suspected hazardous substance exposure over the allowable exposure limit
- Automobile or vehicle-related incidents
- Significant property or equipment damage
- An unplanned fire or explosion
- An unplanned spill or release (including air releases) to the environment
- A permit or permit equivalent exceedance
- Unexpected contact with damage to aboveground or below ground utilities

A near miss incident is described as an undesired event or workplace condition, which under slightly different circumstances had a reasonable probability of resulting in one of the outcomes described above. Some examples of near miss incidents are as follows:

- Tools falling from overhead work near workers below
- Unexpected contact without damage to aboveground or below ground utilities
- Discovery of an unknown and potentially hazardous material or anomaly

Incidents, including near-miss incidents, involving Tetra Tech personnel shall be reported and investigated.

TOTAL is an intuitive system that guides users through the necessary steps to report an incident within 24 hours of its occurrence. TOTAL is a tool to better track incidents, analyze root causes, implement corrective action plans, and share lessons learned. TOTAL is maintained on the secure Tetra Tech Intranet site at <https://my.tetrattech.com/>.

#### **8.4.2 How to Access TOTAL to Report an Incident**

Once on the “My Tetrattech” web site, TOTAL can be found under the “Health and Safety” tab, by clicking on “Incident Reporting.” Select “Report an Incident (TOTAL)” then, near the bottom of the screen, click on “Launch TOTAL Application.” This connects the user directly to TOTAL. Next, click on “Enter new incident”, and follow the steps as presented. The system was designed to be “fail safe” in that the user will not be able to skip any required information. TOTAL can also be accessed directly from the internet using the following web address: <http://totalhs.tetrattech.com/>.

**Note:** When accessing the system from outside the Tetra Tech intranet system or when operating in a wireless mode, a VPN connection will be required. The speed of the application may be dependent upon outside factors such as connection speed, signal strength, etc. Enter the system using your network user name and password. The user name should be in the following format - TT\firstname.lastname.

If any Tetra Tech personnel are injured or develop an illness as a result of working onsite, and they are at a remote location where they cannot establish reliable internet connection with TOTAL to report an incident, then the employee will complete a hard-copy Tetra Tech “Incident Report Form.”

Tetra Tech’s Incident Reporting and Investigation Program requires that employees report all incidents as soon as possible, but within 24 hours. An initial report must be completed on TOTAL within that time frame.

Figure 8-1 is a print out of the screens found online in the TOTAL system. It can be used as a reference during the incident information gathering phase and prior to completing the form on line.

## **9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL**

The follow sections further describe the plans and/or identify the location of the information.

### **9.1 SITE LAYOUT PLANS**

This project will not erect any temporary support facilities. The primary activities of this project will occur outside on or near the site. The task activities must remain mobile, therefore management, supplies, and recordkeeping activity will be supported from the site vehicles.

### **9.2 EMERGENCY RESPONSE PLANS**

The emergency response agencies listed in the APP are capable of providing the most effective response, and as such, are designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The RPM and the POC will be notified if these response agencies are contacted.

#### **9.2.1 Procedures and Tests**

In the event of an emergency situation such as fire or explosion, the FOL/SSHO will activate an air or vehicle horn for approximately 15 seconds, indicating the initiation of evacuation procedures. The personnel in both restricted and non-restricted areas will evacuate and assemble near the support zone, or other safe area, as identified by the FOL/SSHO.

Prior to start of work at any project site, the FOL/SSHO will identify and mark the location of an evacuation assembly area for that project site. The location should be upwind of the site as determined by the wind direction. For efficient and safe site evacuation and assessment of the emergency situation, the FOL/SSHO will have the authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given.

The FOL/SSHO must establish that access for emergency equipment is provided and that the equipment that may cause combustion has been shut down once the alarm has been sounded. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification will commence. The FOL/SSHO will brief site personnel each day as to the location of the evacuation assembly area. Prior to the start of activities at the site, the FOL/SSHO will establish safe egress routes from the site to the

evacuation assembly area. The FOL/SSHO will prepare a drawing, or map, that diagrams these safe egress routes.

### **9.2.2 Spill Plans**

It is not anticipated that bulk quantities of potentially hazardous materials (greater than 55-gallons) may be handled during the site activities. However, if Tetra Tech field crew members discover a spill or leak they will employ the following measures.

- Take immediate actions to stop the leak or to control the spill.
- Notify the FOL/SSHO immediately.
- Avoid contacting container contents.
- The potential hazards will be evaluated to determine the proper personal protection levels, methods, and equipment necessary for the cleanup.
- Spread the absorbent material in the area of the spill covering completely.
- If necessary, the spill area will be evacuated, isolated, and secured.

It is not anticipated that a spill will occur of such magnitude that the field crew cannot handle it. Should this occur, however, the FOL/SSHO will notify appropriate emergency response agencies and the POC immediately.

### **9.2.3 Firefighting Plan**

Workers will only fight incipient stage fires using fire extinguisher available at the work site. Fire extinguishers are intended to fight only fires that have recently occurred and can be reasonably extinguished immediately. Workers will only attempt to fight a fire that can be reasonably extinguished within 30 seconds to 1 minute.

### **9.2.4 Posting of Emergency Telephone Numbers**

The list of emergency telephone numbers will be maintained at the telephone communications points in the site vehicle. See Table 9-1.

**TABLE 9-1**  
**EMERGENCY CONTACTS**  
**CRANE, INDIANA**

CONTACT	TELEPHONE
Base Emergency Numbers* (Fire Department, Base Security, Ambulance) <ul style="list-style-type: none"> <li>• If dialing from an on-base phone:</li> <li>• If dialing from cell or off-base phone:</li> </ul>	9-1-1 (812) 854-3300 or (812) 854-1333
Base Environmental Office	(812) 854-3114
Bedford Ambulance	(812) 279-6545
Bloomington Hospital (Bloomington, Indiana)	(812) 336-9515
Bedford Medical Center (Bedford, Indiana)	(812) 275-1200
Indiana Utility One Call	811
Poison Control Center	(800) 222-1222
National Response Center	(800) 424-8802
Navy RPM, Linda Cole	(847) 688-2600 x 243
Base Contact, Thomas Brent	(812) 854-6160
Tetra Tech PM, Thomas Johnston	(412) 921-8615-office (412) 417-3396 - cell
FOL/SSHO, James Goerd	(412) 921-8425-office (412) 443-0244-cell
Tetra Tech Office, Pittsburgh	(412) 921-7090
Tetra Tech CLEAN HSM, Matthew M. Soltis	(412) 921- 8912-office (412) 260-6681-cell
Tetra Tech PSHO, James K. Laffey	(412) 921-8904-office (412) 370-6668-cell

\*NOTE: On-base extensions 3300 and 1333 are the primary emergency phone numbers. From NSA Crane phones, on Base extensions must be preceded by "854". Off-base numbers can only be reached by dialing "991" first. Emergencies involving site activities should subsequently be reported to the Environmental Protection Department (x -3114/1132/6160).

### **9.2.5 Man Overboard/Abandon Ship**

Not applicable.

### **9.2.6 Medical Support (Onsite/Offsite)**

Tetra Tech will ensure that a minimum of two people have current certifications in CPR/AED, first aid, and blood borne pathogens. Other than rendering basic CPR and first aid, these employees are not expected to perform emergency medical duties. However, they are authorized to perform emergency rescue or other duties up to the level of their training. Emergency medical assistance will be acquired.

Life-threatening medical emergencies will be handled by the calling 9-1-1. Others will be referred to the local hospitals. Maps to these facilities are provided in Figure 9-1.

Tetra Tech personnel are instructed to perform a drive-by of the nearest hospital prior to commencing site activities to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are well mapped. If emergency medical assistance is not required, Tetra Tech personnel may contact WorkCare (occupational medicine provider) as detailed in the APP.

#### **9.2.6.1 Medical Data Sheet**

Each field team member, including visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet (see Figure 9-2). This shall be provided to the SSHO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention. Any pertinent information regarding allergies to medications or other special conditions should be documented. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel.

### **9.3 SUBSTANCE ABUSE POLICY**

The Tetra Tech Substance Abuse policy prohibits the unlawful manufacture, distribution, dispensation, possession, or use of alcohol, illegal drugs or intoxicants on any Company-owned or leased space, client facility, or work site. Use of these substances, regardless of whether it is determined that such use occurred during the work hours or at a company work location, or whether such use actually affected an employee's ability to perform his or her job, is a violation of this policy.

In order to enforce this policy, the Company may investigate potential violations and require personnel to undergo drug/alcohol screening, including urinalysis, blood tests or other appropriate tests. The Company

may also conduct searches of all areas of the Company premises, including, but not limited to work areas, rest rooms, break areas, personal articles, employee's clothes, desks, work stations, lockers, and personal and Company-owned vehicles.

Violation of this policy or any of its provisions may result in disciplinary action up to and including termination of employment. Employees may be subject to discipline up to and including termination for refusing to cooperate with searches or investigations, refusing to submit to screening, or failing to execute consent forms when required by supervisors.

Employees who are convicted of any criminal drug statute for a violation occurring in the workplace are required to notify their Human Resources Representative no later than five days after the conviction. It shall also be the responsibility of each employee who observes or has knowledge of another employee in a condition which impairs the employee to perform his or her job duties or who presents a hazard to the safety and welfare of others to promptly report that fact to his or her immediate supervisor.

#### **9.4 SITE SANITATION PLAN**

Housekeeping is an important issue at each work site. The work sites shall be kept as clean as possible during task operation, taking into consideration the nature of the work. The FOL/SSHO is responsible to ensure that housekeeping occurs on a continuous basis.

Drinking water is provided for each site worker. An adequate supply of cool potable water is provided at the sites for both drinking and personal cleansing.

Public accessible toilets will be utilized while on site. The work conducted under this task order will be by mobile crews at normally unattended locations. Transportation is readily available to nearby toilet and/or washing facilities.

Showers, changing rooms, clothes drying facilities and food service are available near the site. Heavy duty plastic trash bags will be used to collect waste. Waste receptacles will be provided on site as needed.

#### **9.5 ACCESS AND HAUL ROAD PLAN**

Not applicable.

#### **9.6 RESPIRATORY PROTECTION PLAN**

Not applicable.

## **9.7 HEALTH HAZARD CONTROL PLAN**

The primary health hazards associated with this project are physical, chemical and biological hazards associated with sample collecting. The APP describes mitigation measures to reduce these hazards. Detailed task-specific hazards and controls are provided in the AHAs in Section 10.0

## **9.8 HAZARD COMMUNICATION PROGRAM**

Site operations will be compliant with the provisions of the OSHA Hazard Communication 29 CFR 1910.1200(f) Standard.

### **9.8.1 SDS**

Tetra Tech will provide SDSs for chemicals brought onsite. The contents of these documents will be reviewed by the FOL/SSHO with the user(s) of the chemical substances prior to any actual use or application of the substances onsite. The SDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

### **9.8.2 Chemical Inventory**

The FOL/SSHO is responsible to develop and maintain an accurate chemical inventory list for the chemicals that will be used and stored at that workplace.

### **9.8.3 Container Labeling**

When a chemical is brought onsite, the FOL/SSHO is responsible for its receipt will verify that the container is properly labeled with the following information:

- Name, Address and Telephone Number
- Product Identifier
- Signal Word
- Hazard Statement
- Precautionary Statement(s)
- Pictograms

#### **9.8.4 Training**

Any new chemicals brought onsite that may present new hazards may require additional training. The FOL/SSHO will ensure that the appropriate training is conducted for the site personnel required to use the chemical.

#### **9.9 PROCESS SAFETY MANAGEMENT PLAN**

Not applicable

#### **9.10 LEAD ABATEMENT PLAN**

Not applicable

#### **9.11 ASBESTOS ABATEMENT PLAN**

Not applicable

#### **9.12 RADIATION SAFETY PROGRAM**

Not applicable

#### **9.13 ABRASIVE BLASTING**

Not applicable

#### **9.14 HEAT/COLD STRESS MONITORING PLAN**

It is necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat and cold stress. While it is unlikely, if such conditions are encountered use the following information on heat and cold stress recognition, prevention and control.

Ambient temperature extremes (hot or cold working environments) may occur during performance of hazardous waste work depending on the project schedule. Work performed when ambient air temperatures are below 50 degrees Fahrenheit (°F) may result in varying levels of cold stress (frost nip, frost bite, and/or hypothermia) depending on environmental factors such as temperature, wind speed, and humidity; physiological factors such as metabolic rate and moisture content of the skin; and other factors such as work load and the protective clothing being worn. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on factors similar to those presented above for cold stress.

In either case, these conditions can be debilitating and, when extreme, they can be fatal. An understanding of the importance in preventing heat/cold stress, coupled with the worker's awareness of the signs and symptoms of overexposure, can significantly reduce the potential for adverse health effects. If this hazard is present during site operations, each worker will be provided with information necessary to protect themselves, and site management will be instructed to permit frequent breaks in mild temperature rest areas having hot/cold fluids available for consumption. When site personnel are required to wear semi-permeable (Saranex, Tyvek) or impermeable protective clothing to perform their assigned tasks and ambient temperatures are 70°F or higher, biological monitoring may be performed and data compared to the most recent recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH).

#### **9.14.1 Heat Related Disorders**

There are four heat related disorders to monitor while performing work onsite.

##### **9.14.1.1 Heat Rash**

Also known as prickly heat, this condition affects the skin. It occurs in situations where the skin remains wet most of the time. The sweat ducts become plugged and a skin rash soon appears.

###### **9.14.1.1.1 Signs and Symptoms**

- Skin rash will appear on affected areas of the body.
- Tingling or prickling sensation will be felt on the affected areas.

##### **9.14.1.2 Heat Cramps**

Heat cramps are muscle pains, usually in the lower extremities, the abdomen, or both, that occur after profuse sweating with accompanying salt depletion. Heat cramps most often afflict people in good physical condition, who overwork in conditions of high temperature and humidity. Untreated, heat cramps may progress to heat exhaustion.

###### **9.14.1.2.1 Signs and Symptoms**

- Cramps in the extremities and abdomen that begin suddenly during vigorous activity. Heat cramps can be mild with only slight abdominal cramping and tingling in the extremities, but more commonly present intense and incapacitating pain in the abdomen and extremities.
- Respiration rate will increase, decreasing after the pain subsides.

- Pulse rate will increase.
- Skin will be pale and moist.
- Body temperature will be normal.
- Generalized weakness will be noted as the pain subsides.
- Loss of consciousness and airway maintenance are seldom problems with this condition.

Treatment for heat cramps is aimed at eliminating the exposure and restoring the loss of salt and water.

### **9.14.1.3 Heat Exhaustion**

Heat exhaustion is a more severe response to salt and water loss, as well as an initial disturbance in the body's heat-regulations system. Like heat cramps, heat exhaustion tends to occur in people working in hot environments. Heat exhaustion may progress to heat stroke. Treatment for heat exhaustion is similar in principle to that for heat cramps.

#### 9.14.1.3.1 Signs and Symptoms

- Heat exhaustion may be accompanied present by a headache, fatigue, dizziness, or nausea with occasional abdominal cramping.
- More severe cases of heat exhaustion may result in partial or complete temporary loss of respiration and circulation due to cerebral ischemia.
- Sweating will be profuse.
- Pulse rate will be rapid and weak.
- Respiration rate will be rapid and shallow.
- The skin will be pale and clammy.
- The body temperature will be normal or decreased.
- The person could be irritable and restless.

### **9.14.1.4 Heat Stroke**

Heat stroke is caused by a severe disturbance in the body's heat-regulating system and is a profound emergency: The mortality rate ranges from 25 to 50 percent. It can also occur from having too much exposure to the sun or prolonged confinement in a hot atmosphere. Heat stroke comes on suddenly. As the sweating mechanism fails, the body temperature begins to rise precipitously, reaching 106°F (41°C) or higher within 10 to 15 minutes. If the situation is not corrected rapidly, the body cells -- especially the very vulnerable cells in the brain -- are literally cooked, and the central nervous system is irreversibly damaged. The treatment for heat stroke is aimed at maintaining vital functions and causing as rapid a decrease of body temperature as possible.

#### 9.14.1.4.1 Signs and Symptoms

- The person's pulse will be strong and bounding.
- The skin will be hot, dry, and flushed.
- The worker may experience headache, dizziness, and dryness of mouth
- Seizures and coma can occur.
- Loss of consciousness and airway maintenance problems can occur.

#### **9.14.1.5 Controlling Heat Stress**

The following control measures are only guidelines for heat related emergencies. Actual training in emergency medical care or basic first aid is recommended. Employees will monitor one another for signs of heat stress. If indications of heat stress occur, the following corrective measures will be performed:

- Inform affected workers of the signs and symptoms of heat stress and encourage co-worker observations.
- Schedule tasks that are physically-demanding in early morning and late afternoon timeframes when heavy loads would be less of an issue.
- Notify the FOL/SSHO who may perform biological monitoring to determine the extent of the heat related condition.
- The FOL/SSHO may alter the work regime that will provide adequate rest periods for cooling down. This may require additional shifts of workers.
- The FOL/SSHO may also recommend cooling devices such as vortex tubes or cooling vests be worn beneath protective garments.
- When conditions where heat related disorders may be experienced, the FOL/SSHO through site-specific training and safety briefing will inform site personnel of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.
- Provide adequate liquids to replace lost body fluids.
- Personnel must replace water and salt lost from sweating.

- Personnel must be encouraged to drink more than the amount required to satisfy thirst.
- Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.
- Approximately 1 cup of cool water every 20 minutes is recommended.
- Replacement fluids can be commercial mixes such as Gatorade®.
- Move affected persons into a shaded cool rest area (below 77°F is best).
- Personnel shall remove impermeable protective garments during rest periods.
- Personnel shall not be assigned other tasks during rest periods.
- One of the following biological monitoring procedures may be utilized by the FOL/SSHO to monitor heat stress concerns.
- Heart rate (HR) shall be measured by the pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute.
- If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of rest period stays the same.
- If the pulse rate is 100 beats/minute at the beginning of the next rest period, the following work cycle should be shortened by 33%.
- The length of the initial work period will be determined by using the table below.

**TABLE 9-2**

**PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES**

Work-Rest Regimen	Work Load		
	Light	Moderate	Heavy
<b>Continuous</b>	80.0°F	80.0°F	77.0°F
75% Work - 25% Rest, Each Hour	87.0°F	82.4°F	78.6°F
50% Work - 50% Rest, Each Hour	88.5°F	85.0°F	82.2°F
25% Work - 75% Rest, Each Hour	90.0°F	88.0°F	86.0°F

Body temperature shall be measured orally with a digital thermometer with disposable probe covers or an aural/temporal temperature sensor as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.7°F at the beginning of the next rest period, the following work cycle shall be further shortened by 33%. OT should be measured at the end of the rest period to make sure that it has dropped below 99°F. At no time shall work begin with the oral temperature above 99°F.

**NOTE:** External temperatures in excess of those stated above shall be regarded as inclement weather.

#### 9.14.1.5.1 Temperature Extremes – Heat Stress Indication

Temperature extremes are considered inclement weather. Steps should be taken to the extent possible protect site personnel from the effects of heat stress and the sun. Control measures include:

- Watch for signs of heat stress/exhaustion, see Table 9-3.
- Provide fluid replacement.
- Provide adequate number of breaks within a cooler environment.

Care should be exercised when working outdoors due to harmful effects of the sun. To reduce the potential for sunburn and melanoma use the following measures:

- Wear a hat that shades the face, neck, and ears.
- Apply sunscreen with a SPF of 15 or higher liberally on any exposed skin at least 15 minutes before going outside, then at least every two hours, more if you are sweating a lot.
- Plan/provide suitable equipment to offer shade to avoid the midday sun since the sun's ultraviolet rays are most intense between 10 AM and 4 PM and can damage your skin even on hazy days. Portable canopies over the sample station are an example of this.
- Wear wrap-around sunglasses to protect the eyes and delicate skin around them.

**TABLE 9-3**  
**HEAT STRAIN SYMPTOMS**

Stop work if any worker demonstrates any of the following:

Heart Rate	Sustained (several minutes) heart rate minus worker's age > than 180 beats per minute (bpm) measured at any time.
Body Core Temperature	> 101.3°F (38.5° C)
Recovery Heart Rate	> 110 bpm (measured 1 minute after peak work effort)
Other symptoms	Sudden and sever fatigue, nausea, dizziness, or headache

Individuals may be at greater risk of heat stress when:

- Profuse sweating is sustained over hours
- Weight loss over a shift is > 1.5% of beginning body weight
- 24-hour urinary sodium excretion is less than 50 nmoles

#### 9.14.1.5.2 First Aid for Heat Stroke

Take the following steps to treat a worker with heat stroke:

- Call NSA Crane Emergency Dispatch Center and notify FOL/SSHO.
- Move the affected individual to a cool shaded area.
- Cool the worker using methods such as:
  - Soaking their clothes with water.
  - Spraying, sponging, or showering them with water.
  - Fanning their body.

#### 9.14.1.5.3 First Aid for Heat Exhaustion

Treat victim suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

#### 9.14.1.5.4 First Aid for Heat Cramps

Individuals with heat cramps should:

- Stop all activity, and sit in a cool place.
- Drink clear water, juice or a sports beverage.
- Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention if any of the following apply:
  - The person has heart problems.
  - The person is on a low-sodium diet.
  - The cramps do not subside within one hour.

#### 9.14.1.5.5 First Aid for Heat Rash

Workers experiencing heat rash should:

- Try to work in a cooler, less humid environment when possible.
- Keep the affected area dry.
- Dusting powder may be used to increase comfort.

### 9.14.2 Cold Stress Related Disorders

Just as heat can present a problem for on-site personnel during certain activities, so can cold temperatures. Just as the heat related disorders are magnified by environmental conditions and the tasks to be completed, so are the cold related disorders. As above, the focus is on recognizing conditions contributing to cold related disorders and selecting the most appropriate control measure.

The ACGIH cold stress Threshold Limit Values (TLVs) are recommended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body temperature from falling below 36°degrees centigrade (°C) or (96.8°F) and to prevent cold injury to body extremities (deep body temperature is the core temperature of the body determined by conventional methods for rectal temperature measurements). For a single, occasional exposure to a cold environment, a drop in core temperature to no lower than 35°C (95°F) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

Fatal exposures to cold among workers have almost always resulted from accidental exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. The clinical presentations of victims of hypothermia are shown in Table 9-4. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (96.8°F); lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

**TABLE 9-4**  
**PROGRESSIVE CLINICAL PRESENTATIONS OF HYPOTHERMIA\***

Core Temperature		Clinical Signs
°C	°F	
37.6	99.6	"Normal" rectal temperature
37	98.6	"Normal" oral temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
32	89.6	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated but react to light; shivering ceases
31	87.8	
30	86.0	Progressive loss of consciousness; muscular rigidity increases; pulse and blood pressure difficult to obtain; respiratory rate decreases
29	84.2	
28	82.4	Ventricular fibrillation possible with myocardial irritability
27	80.6	Voluntary motion ceases; pupils nonreactive to light; deep tendon and superficial reflexes absent
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema
22	71.6	Maximum risk of ventricular fibrillation
21	69.8	
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover
17	62.6	Isoelectric electroencephalogram
9	48.2	Lowest artificially cooled hypothermia patient to recover

\* Presentations approximately related to core temperature. Reprinted from the American Family Physician, published by the American Academy of Family Physicians.

#### 9.14.2.1 Signs and Symptoms

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering occurs when the body temperature has fallen to 3°C (95°F). This must be taken as a sign of danger and exposure to cold should be immediately terminated when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

#### **9.14.2.2 Control Measures**

Since prolonged exposure to cold air or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided.

- Adequate insulating dry clothing to maintain core temperatures above 36°C (96.8°F) must be provided to workers if work is performed in air temperatures below 4°C (40°F).
- Wind chill cooling rate and the cooling power of air are critical factors. [Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.]
- The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.
- An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Table 9-5.
- The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.
- Unless there are unusual or extenuating circumstances, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia.
- Older workers or workers with circulatory problems require special precautionary protection against cold injury.
  - The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which should be considered.
  - The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.
- Acclimatization – With exposure the body does undergo changes that will permit it to adjust to the cold weather better.

**TABLE 9-5**  
**COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS EQUIVALENT TEMPERATURE**  
**(under calm conditions)\***

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
Equivalent 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 < 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.

- Dehydration – Water and salt loss magnifies conditions associated with hypothermia. Warm, sweet nonalcoholic fluids should be employed for fluid replacement. Soup, non-caffeinated drinks including decaffeinated teas, coffees, etc. are suitable for this purpose.
- Diet – A balanced diet can provide the body with the necessary nutrients to aid in combating cold stress. Restrictive diets avoiding salts, carbohydrates, etc. may rob you of certain elements that you need. Caffeine and alcoholic drinks may increase the effects of a cold environment through the loss of water and salts.
- Caffeine and alcoholic drinks may increase the effects of a cold environment through the loss of water and salts.
- Engineering Controls such as wind shields/barriers may be used to control the potential effects of cold stress.
- Administrative controls such as worker rotation; work/warm regimens; required fluid intake; scheduling the work for warmer weather; assigning more workers to the task to complete it quicker.
- Overall physical condition should always be considered when combating cold stress.
  - Older persons and those on certain medications (blood pressure control) are vulnerable to cold environment and cold stress disorders.
- Environmental monitoring results will tell you if the conditions are such that cold related disorders can occur.
  - Biological monitoring will provide real time information as to the progression of the cold related disorders within your field crew.

#### **9.14.2.3 Monitoring**

- Core temperature
  - Ensure that it does not drop below 96.8°F
- Weight Loss
  - Monitoring weight loss may be indicative of water and salt loss through dehydration.
  - >2% changes in body weight are indicative of water loss.
- Visual observation of signs and symptoms of overexposure.

#### **9.14.2.4 Special Conditions - Evaluation and Control**

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -32°C (-25.6°F). Superficial or deep local tissue freezing will occur only at temperatures below -1°C (30.2°F) regardless of wind speed.

At air temperatures of 2°C (35.6°F) or less, it is imperative that workers who become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and be treated for hypothermia.

TLVs recommended for properly clothed workers for periods of work at temperatures below freezing are shown in Table 9-6.

- Caffeine and alcoholic drinks may increase the effects of a cold environment through the loss of water and salts.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents:

- If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 16°C (60.8°F), special provisions should be established for keeping the workers' hands warm.
- For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized.

Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below -1°C (30.2°F).

- If the air temperature falls below 16°C (60.8°F) for sedentary, 4°C (39.2°F) for light, -7°C (19.4°F) for moderate work and fine manual dexterity is not required, then gloves should be used by the workers.
- To prevent contact frostbite, the workers should wear anti-contact gloves.
- When cold surfaces below -7°C (19.4°F) are within reach, a warning should be given to each worker by the supervisor to prevent inadvertent contact by bare skin.
- If the air temperature is -17.5°C (0°F) or less, the hands should be protected by mittens.

**TABLE 9-6**  
**THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT\***

Air Temperature - Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks								
-26° to -28°	-15° to -19°	(Norm Breaks)	1	(Norm Breaks)	1	75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Norm Breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	Non-emergency work should cease
-35° to -37°	-30° to -34°	55 min	3	40 min	2	30 min	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min	4	30 min	1	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

**NOTES:**

- Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at -35°C (-30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
- The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
- If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: (1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/M<sup>2</sup>; (2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder ranges, since windy conditions rarely prevail at extremely low temperatures.
- TLVs apply only for workers in dry clothing.

\* Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labor.

- Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.
- Provisions for additional total body protection are required if work is performed in an environment at or below 4°C (39.2°F). The workers should wear cold protective clothing appropriate for the level of cold and physical activity:
- If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use may be of a type impermeable to water.
- With more severe work under such conditions, the outer layer should be water repellent, and the outerwear should be changed as it becomes wetted.
- The outer garments should include provisions for easy ventilation in order to prevent wetting of inner layers of sweat.
- If work is done at normal temperatures or in a hot environment before entering the cold area, the employee should make sure that clothing is not wet as a consequence of sweating.
- If clothing is wet, the employee should change into dry clothes before entering the cold area.
- The workers should change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots.
- The optimal frequency of change should be determined empirically and will vary individually and according to the type of shoe worn and how much the individual's feet sweat.
- If exposed areas of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should be supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

#### **9.14.2.5 Work - Warming Regimen**

If work is performed continuously in the cold at an equivalent chill temperature (ECT) or below -7°C (19.4°F), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The workers should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing should be provided as necessary to prevent workers from returning to work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of the diuretic and circulatory effects.

For work practices at or below -12°C (10.4°F) ECT, the following should apply:

- The worker should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods should be taken in heated shelters and opportunity for changing into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become accustomed to the working conditions and required protective clothing.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the worker.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized.
- Unprotected metal chair seats should not be used.
- The worker should be protected from drafts to the greatest extent possible.
- The workers should be instructed in safety and health procedures.

- The training program should include as a minimum instruction in:
  - Proper rewarming procedures and appropriate first aid treatment.
  - Proper clothing practices.
  - Proper eating and drinking habits.
  - Recognition of impending frostbite.
  - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
  - Safe work practices.

**Note:** This information has been adopted from the 2010-1011 "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices" by the American Conference of Governmental Industrial Hygienists (ACGIH).

As conditions may vary, it will be at the discretion of the Field Operations Leader and the Site Safety Officer to temporarily suspend or terminate activities as conditions dictate. All site activities will be terminated in the advent of electrical storms, tornadoes, and other hazardous weather conditions.

#### **9.15 CRYSTALLINE SILICA MONITORING PLAN**

Not applicable.

#### **9.16 NIGHT OPERATIONS LIGHTING PLAN**

Not applicable.

#### **9.17 FIRE PREVENTION PLAN**

Combustible materials will be protected from heat, flames, and sparks by moving or covering them. Flammables will be kept in closed containers. Safety cans will be used, when required. The site workers have training on the use of portable fire extinguishers. Each site vehicle has at least a 5-lb dry chemical, ABC fire extinguisher.

#### **9.18 WILD LAND FIRE MANAGEMENT PLAN**

Not applicable.

**9.19 HAZARDOUS ENERGY CONTROL PLAN**

Not applicable.

**9.20 CRITICAL LIFT PLAN**

Not applicable.

**9.21 CONTINGENCY PLAN FOR SEVERE WEATHER**

The FOL/SSHO will monitor the weather forecast daily. In preparation for an approaching storm, all equipment will be secured, and all doors and windows of the equipment will be closed. All tools and supplies will be stored in a designated secure location.

**9.22 FLOAT PLAN**

Not applicable.

**9.23 SITE-SPECIFIC FALL PROTECTION & PREVENTION PLAN DEMOLITION PLAN**

Not applicable.

**9.24 DEMOLITION PLAN**

Not applicable.

**9.25 EXCAVATION/TRENCHING PLAN**

Not applicable.

**9.26 EMERGENCY RESCUE (TUNNELING)**

Not applicable.

**9.27 UNDERGROUND CONSTRUCTION FIRE PREVENTION AND PROTECTION PLAN**

Not applicable.

**9.28 COMPRESSED AIR PLAN**

Not applicable.

**9.29 FORMWORK AND SHORING ERECTION AND REMOVAL PLANS**

Not applicable.

**9.30 PRECAST CONCRETE PLAN**

Not applicable.

**9.31 LIFT SLAB PLANS**

Not applicable.

**9.32 STEEL ERECTION PLAN**

Not applicable.

**9.33 SITE SAFETY AND HEALTH PLAN FOR HTRW WORK**

This Site Safety and Health Plan (SSHP) establishes policies and procedures to protect workers and the public from the potential hazards posed during field operations at SWMU 17. It was developed using historical site background information regarding known or suspected chemical contaminants, information obtained on previous site visits, and knowledge of potential physical hazards that may be associated with the proposed work at the site.

This SSHP will be modified, as necessary, if new information becomes available, and changes will be made with the approval of the Tetra Tech FOL/SSHO and the HSM. Requests for modifications to the SSHP should be directed to the FOL/SSHO. The FOL/SSHO will notify the HSM, who will then notify affected personnel of the changes.

**9.33.1 Site Description and Contamination Characterization**

The PCB Capacitor Burial/Pole Yard (SWMU 17) has been in use since the 1970s. There is reported information indicating that capacitors and transformers were buried at SWMU 17 in the early 1970s. Excavation activities in and around the dumping area found electrical insulators, transformers and miscellaneous debris.

In addition, utility poles impregnated with creosote and potentially contaminated with PCBs, were also stored in this area.

NSA Crane intends to utilize the area for different purposes than its current use. In September, 2004 more than 2930 tons of soil was excavated to 2 feet and the site was covered with clean fill. Due to contractual obligations, excavation operations ceased before all of the contaminated soils were removed. The vertical extent of this contamination remains ill defined. PCB contaminated soil was found in the drainageways downgradient of the areas where previous excavations occurred.

The use of PCBs as a dielectric cooling fluid ceased in 1977. The fact that burial disposal occurred up to 1970 is the first indicator that PCBs will be encountered associated with this debris. Intact or partially damaged intact capacitors and transformers may have a date of manufacture label (Pre 1977 assume PCBs), labels indicating the device contains PCBs, or may contain PCBs (1977 or later). This would indicate the dumping area was used past 1977.

If there are no labels, or the labels are defaced and you cannot make it out, assume the device contains PCBs.

#### **9.33.1.1 Chemical Exposure Potential**

Based on previous sampling data and historical site information, the contaminants of concern associated with this site are PCBs. It is not anticipated that levels will be encountered that are of concern to field workers. It is recommended that exposure (via inhalation, ingestion, or skin contact) to these contaminants be minimized through the use of PPE, good work hygiene practices, and area wetting techniques, if necessary.

Based on the maximum concentration of PCBs previously sampled at the site, in a worst case scenario, the amount of dust-in-air that would have to be generated to reach the current occupational exposure limit is well within the visible range (>2.5 mg/m<sup>3</sup>).

As a precaution, workers will watch for the generation of visible dust and utilize area wetting techniques if dust is generated to knock down airborne dusts. The greatest potential will be associated with excavation activities.

#### **9.33.1.2 COCs Properties and Exposure Signs/Symptoms**

PCBs were widely used for many applications, especially as dielectric coolants in transformers, capacitors, and other associated electrical equipment. Due to PCB's toxicity and classification as a persistent organic

pollutant (bioaccumulative properties), PCB production was banned by the United States Congress in 1979 and by the Stockholm Convention on Persistent Organic Pollutants in 2001. Concerns about the toxicity of PCBs are largely based on compounds within this group which share a structural similarity and toxic mode of action with dioxin and furans. Toxic effects such as endocrine disruption and neurotoxicity are also associated with other compounds within the group.

The most commonly observed health effects in people exposed to extremely high levels of PCBs are skin conditions, such as chloracne and rashes, but these were known to be symptoms of acute systemic poisoning dating back to 1922. Studies in workers exposed to PCBs have shown changes in blood and urine that may indicate liver damage. In Japan in 1968, 280 kg of PCB-contaminated rice bran oil was used as chicken feed, resulting in a mass poisoning, known as Yushō disease, in over 14,000 people. Common symptoms included dermal and ocular lesions, irregular menstrual cycles, and lowered immune responses. Other symptoms included fatigue, headaches, coughs, and unusual skin sores. Additionally, in children, there were reports of poor cognitive development.

#### **9.33.1.3 *Inhalation, Ingestion, and Direct Contact***

It is important to keep in mind that the planned work area is outdoors, with ample natural ventilation that will reduce any airborne particulates through dilution and dispersion and the work being conducted is non-intrusive.

As a result of this, although possible, it is very unlikely that workers participating in these activities will encounter any airborne concentrations of the above COCs that would represent an occupational exposure concern. Examples of onsite practices that are to be observed that will protect workers from exposure via inhalation include:

- Positioning the excavator upwind
- Using area wetting to control and knock down airborne dust clouds.
- During dumping of the dirt from the bucket the bucket will be placed onto the spoils pile to minimize dust generation as the bucket is unloaded.
- The operator will work in an enclosed cab, if dusty conditions cannot be controlled.

Potential exposure concerns to these Contaminants of Concern (COC) may also occur through ingesting or coming into direct skin contact with contaminated soils. However, the likelihood of worker exposure concerns through these two routes is also considered very unlikely, provided that:

- Workers follow good personal and work hygiene practices such as no hand-to-mouth activities on site (eating, drinking, smoking, etc.)

- Workers employ good sample collection/sample handling practices including wearing proper gloves whenever handling potentially-contaminated media, including soils, hand tools, and sample containers. Cleaning the outside of sample containers of residual soils as well as single and reusable sampling tools.
- Be diligent in the decontamination process as well as site control to minimize migration
- Working from what is suspected to be the least contaminated area to the most to avoid cross contamination.

### **9.33.2 Hazard/Risk Analysis**

The potential hazards associated with the site activities also include physical hazards and biological hazards. The potential for encountering various hazards will depend on the work being conducted, the location of that work, and the time of year. Specific hazards are discussed below. There are also environmental hazards associated with the physical location of the site (such as vehicular traffic) and weather conditions such as heat, noise, and flora and fauna contact. An AHA has been developed for each planned activity and operation occurring in each major phase of work for the project. Each AHA identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. The AHA is used to augment daily health and safety meetings, and is intended to heighten safety and hazard awareness on the job. A pre-task briefing will be documented, and may be combined with the daily tailgate safety meeting. AHAs are the focal point for safe conduct of work on a project. Since each task is described and evaluated, workers should be better prepared to perform work safely. The FOL/SSHO will discuss the risks and precautions associated with each task identified in the Work Plan. Daily tailgate safety meetings are held at the start of each shift. Prior to the day's activity, the safety meeting discusses the potential chemical, physical, and environmental hazards that could be encountered, along with preventive safety measures. During a work day, if there are any changes or new conditions to be addressed, the FOL/SSHO will update the AHA and ensure the workers review the amended AHA. Attendance is mandatory for the employees involved in the specific work identified by the AHA. Amended AHAs must be reviewed by the PHSM. If a change must be implemented immediately and the PHSM cannot be contacted, the FOL/SSHO may implement the change and forward a copy of the change to the PHSM as soon as possible, leaving a voicemail phone message for the PHSM. The AHAs for this project are located in Section 10.0 of the APP. The FOL/SSHO will modify these AHAs as appropriate, add new AHAs for new tasks, and train the employees who perform the tasks on the appropriate AHA. The FOL/SSHO will forward any modified or new AHAs to the PHSM for review and approval.

### **9.33.2.1 Classic Safety**

In the site hazard assessment, preliminary site-specific hazards will be identified through the AHAs generated during development of the SSHP to determine the appropriate safety and health procedures needed to protect workers from the identified physical, biological, chemical, and natural hazards. This section is intended to provide information on some of the most commonly encountered hazards associated with the tasks anticipated at SWMU 17. This section will also reference some of the common safe work practices, PPE, and administrative controls generally used to mitigate potential hazards. Some of these hazards can be regarded as most severe or as more commonly-encountered in remedial activities such as these, and are further addressed in the following subsections.

#### **9.33.2.1.1 Slips, Trips, and Falls**

Planned activities associated with hazardous waste operations/construction operations will bring field personnel into areas where potential slip, trip, and fall hazards. These hazards may include the following:

- Uneven terrain due to excavation
- Plastic protective covers (e.g., associated with temporary decontamination pads)
- Work place clutter (e.g., tangled hoses)

Hazards of this nature and the potential consequences of injury from a slip, trip or fall are magnified when personnel are maneuvering and carrying equipment on these work sites. Control measures may include the following:

- Selecting the best approach routes to work areas and locations, keeping in mind that these may not be the shortest routes
- Where necessary, using rope ladders and associated mechanisms to aid in ascent and descent
- Applying traction grit such as sand over slippery surfaces
- Maintaining good housekeeping practices.

The FOL/SSHO will evaluate all walking/working surfaces to ensure these comply with the objectives stipulated in 29 CFR 1926 Subparts C – General Safety and Health; G – Signs, Signals and Barricades; Subpart L – Scaffolds; Subpart M – Fall Protection; and Subpart X – Stairways and Ladders. Requisite strength, heights and widths, and fall protection will be evaluated.

#### 9.33.2.1.2 Head and Back Injuries

At a minimum, workers will don safety shoes/boots and safety glasses prior to performing any or investigation activities. Hard hats will be worn when overhead hazards are present or heavy machinery (e.g., direct-push rigs, drill rigs) is in use. This will prevent minor injuries caused by bumping one's head while working around and under equipment and vegetation. Personnel are instructed in proper lifting techniques and will not lift heavy items without assistance. Each worker will not lift more than 50 pounds. Objects heavier than 50 pounds, and those with uneven weight distribution, may require assistance from another person. Supervisors will use mechanical lifting equipment whenever possible to minimize worker exposure to lifting hazards.

#### 9.33.2.1.3 Falling Objects

The items raised will be slowly lowered to the ground using a grapple and/or skip bucket. No personnel will work under equipment at any time. Also, the supervisor will verify that an adequate area is clear of personnel while the equipment is in operation.

#### 9.33.2.1.4 Heavy or Awkward Lifting

Hazards associated with heavy or awkward lifting become more predominant in the early morning hours (prior to muscles becoming limber) and later in the day (as a result of fatigue). The following provisions will be used to minimize hazards of this nature:

- Use machinery, lifting assist devices (two wheeled carts or dollies), or multiple personnel for heavy lifts, where possible.
- Use proper lifting techniques.
- Plan your lifts
  - Place heavy items on shelves between the waist and chest and lighter items on higher shelves.
  - If the load must be carried to another location, plan and inspect the route to ensure that slipping/tripping hazards are absent.
- Stretch and limber muscles prior to and after extended periods/frequent lifts.
- “Test” the lift, i.e., before attempting to fully lift or move an object, give the object a “nudge” to assess its approximate weight and your ability to safely lift and move it without injury.

- If you are unsure that you can complete the lift without hurting yourself, either get a lifting aid (such as a dolly or mechanical hoist), get help from others, or both.
- Move as close to the load as possible, and ensure that good hand holds are obtainable. Wear gloves where necessary to improve hand holds.
- Lift with your legs not your back, bend your knees and avoid turning and twisting when lifting, carrying, or depositing loads.
- Break lifts into steps if the vertical distance from the starting point to the placement of the lift is excessive.
- Periods of high-frequency lifts or extended-duration lifts should include sufficient breaks to guard against fatigue and injury.
- Assess the area available to maneuver the lift.
  - Rearrange the area, remove clutter, and minimize the necessity of twisting and turning.
- Evaluate area of the lift.
  - Conditions of the walking/working surfaces where the lift will occur, over the planned path of travel, and at the location the load will be deposited.
  - Conditions such as poor housekeeping/clutter, slippery surfaces, and rough or uneven terrain may magnify the potential for injury during a lift.
- Your overall physical condition
  - Report previous injuries on your Medical Data Sheet.
  - DO NOT attempt to lift items that will put you at risk.
  - Break loads that you must carry into smaller manageable loads, and get assistance whenever significant lifting tasks are involved.

By evaluating applicable contributing factors, planning your lifts, and incorporating feasible control measures, the potential for injury associated with lifting can be minimized.

#### 9.33.2.1.5 Noise

Site activities will not expose site personnel to equipment or conditions exceeding occupational noise exposure limit action levels. However, if abnormal conditions exist and site personnel are exposed to noise

equal to or exceeding the OSHA 8-hour Time-Weighted Average sound level [85 decibels adjusted (dBA)] the FOL/SSHO will ensure the following measures are employed:

- Effective use of hearing protection will be implemented by personnel working near the excessive noise sources.
- Site workers will evacuate to a safe area until the noise subsides
- Engineering and/or administrative controls may be used to reduce employee exposures to noise.

Workers on site will be informed to observe the “noise rule of thumb” on this project, described as follows:

- In general, if a worker must raise his/her voice to be heard by someone standing next to him/her (within 2 feet), noise levels may be exceeding 85 dBA and hearing protection will be required.

### **9.33.2.2 Biological Hazards**

Biological hazards may be encountered on site. Workers should anticipate the increased likelihood of encountering these hazards. Insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be more serious such as anaphylactic shock, which can lead to severe reactions in the circulatory, respiratory, and central nervous system and, in some cases, even death. The FOL/SSHO will identify personnel with a known reaction to bites and stings at the pre job safety orientation meeting. Personnel will not attempt to capture or feed any wild or semi wild animals such as cats, rats, or ground squirrels due to the possibility of a bite or parasitic infestation. Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard, including lung diseases and allergies. Personnel will not touch visual droppings.

#### **9.33.2.2.1 Insects**

Insects, including bees, wasps, hornets, spiders and ticks, may be present at this site making the chance of a bite or sting very possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect will notify the SSHO. Field personnel who may have insect allergies will provide this information to the SSHO prior to commencing work, and will have allergy medication on site. The following is a list of preventive measures: Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply DEET (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing. Wear proper protective clothing (work boots, socks and pants). When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.

Mild insect stings or bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snake bite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought immediately. Immediate medical care is essential for persons who are allergic to insect bites/stings. If an allergic person receives spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim.

#### 9.33.2.2.1.1 Spiders

Various spiders may be encountered at the SWMU 17; however, two spiders are potentially in the area that are poisonous – the Black Widow and Brown Recluse. The Black Widow spider varies from dark brown to black in color. Its body is 1/4 inch wide and overall size is 1-1/2 inches with legs extended. Only the female is poisonous and can be determined by the red or yellow hourglass marking the underside of the abdomen. The Brown Recluse has a characteristic fiddle-shaped pattern on their head region. The spider is golden brown with the fiddle being dark brown or black. This spider is not hairy and the fiddle pattern is often shiny. They are about 1/4 to 3/4 inch long. The victim will experience the following if a Black Widow or Brown Recluse spider has bitten them:

- The spider's bite will feel like a sharp pinprick or may not even be noticed.
- In 15 minutes or less, the person will feel a dull numbing pain in the bitten area.
- A faint red bite mark appears.
- Black Widow bites in the lower part of the body or legs will cause the victim will have muscle stiffness or cramps in their abdomen.
  - If the bite is on the upper body or arms, the victim will have muscle stiffness or cramps affecting the shoulders, back, or chest.
  - Additionally, the victim may experience headache, chills, fever, heavy sweating, dizziness, nausea, vomiting, and severe abdominal pain.
- Brown Recluse bite severity may vary.
  - The symptoms may vary from no harm to a very severe reaction.
  - Often there is a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness, and joint pain.
  - Where the bite occurs there is often tissue death and skin is sloughed off. In some severe cases, a wound may develop that lasts several months.

- First aid procedures for spider bites are as follows:
  - Clean the bitten area with soap and water or rubbing alcohol.
  - Do not apply a constricting band because the black widow venom's action is swift; there is little to be gained by trying to slow absorption with a constriction band.
  - To relieve pain, place an ice pack over the bite.
  - Keep the victim quiet and monitor breathing.
  - Seek immediate medical attention.
  - If possible, catch the spider to confirm its identity, even if the body is crushed.

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

See Section 4.0 of the APP.

### **9.33.4 Training**

See Section 6.0 of this APP.

### **9.33.5 Personal Protective Equipment**

The levels of personal protection to be used for work tasks at the SWMU 17 site have been selected based on the nature of the planned work activities and on the known or anticipated hazards; types and concentrations of contaminants that may be encountered onsite; and contaminant properties, toxicity, exposure routes, and matrixes.

PPE is selected by the PHSO when writing the SSHP, and is confirmed through a rigorous review process by the Tetra Tech HSM. To assure proper PPE has been selected, both the physical and chemical hazards present at the job site are taken into account in both developing and reviewing safety-related documents.

The anticipated levels of protection selected for use by field personnel during site activities is the U.S Environmental Protection Agency (EPA) Level D. If site conditions performed during site activities warrant a higher level of protection, the field personnel will withdraw from the site, immediately notify the Tetra Tech PHSO, and obtain further instructions.

PPE levels can be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed.

PPE has been selected based on the results of task-specific hazard assessments. Through the completion of employee training (e.g., introductory 40-hour hazardous waste training, annual refresher training, etc.),

Tetra Tech employees have been informed of the proper selection, use, and care of PPE items provided to them. After PPE is provided to an employee, the responsibility for using and caring for it appropriately is the responsibility of that employee. The FOL/SSHO is responsible for assuring that these responsibilities are fulfilled through daily observations and work area inspections at the sites. The FOL/SSHO is also responsible for assuring that appropriate and adequate supplies of PPE are maintained such that they are readily available for issuance/replacement and in a clean and sanitary manner and location. The site personnel will use the procedures presented in the AHAs to obtain optimum performance from PPE.

The levels of personal protection to be used for work tasks have been selected based on the nature of the planned work activities and on the known or anticipated hazards. Specific PPE selected for this project is listed, by task, in the AHAs located in Section 10.0 of the APP. The PPE minimum is as follows:

- Safety glasses with side shields when there is a possibility of splashing liquids
- Hard hat if near overhead hazards
- Shirts and long pants
- Water resistant shoe/boots with slip-resistant soles
- Tyvek® coverall type suits if a chance of soiling clothing

#### **9.33.6 Medical Surveillance**

Personnel performing onsite work that will result in exposure to contaminant-related health and safety hazards shall be enrolled in a medical surveillance program that complies with OSHA standards 29 CFR 1910.120 (f) and 29 CFR 1926.65(f). Site personnel will have had a physical examination, conducted by a board certified occupational medicine physician, which meets the requirements of Tetra Tech's medical surveillance program. Certification of medical surveillance program participation is appended to the SSHP. The certification shall include:

- Employee name
- Date of last examination
- Name of examining physician(s).

The required written occupational physician's opinion shall be made available upon request to the USACE Contracting Officers Representative. The medical records shall be maintained in accordance with 29 CFR 1910.1020. Attachment I contains the certification of participation in a medical surveillance program.

### **9.33.7 Exposure Monitoring/Air Sampling Program**

It is not anticipated that direct reading instruments will be used at this site to determine potential worker exposure to particulates and particulate based contaminants. This determination is based on the ability, through work practices, to control airborne dust generation and exposure to associated contaminants. This measure is further supported given remedial removal of contaminated soils has occurred in the past further reducing soil contaminant levels. As a precaution, workers will watch for the generation of visible dust and utilize area wetting techniques if dust is generated.

### **9.33.8 Heat and Cold Stress**

See Section 9.14 of this APP.

### **9.33.9 Standard Operating Procedures, Engineering Controls and Work Practices**

In addition to the task-specific work practices and restrictions identified in the AHAs found in Section 10.0 of the APP, the following general safe work practices are to be followed when conducting work on-site.

- Personnel engaged in onsite activities will practice the "buddy system" to ensure the safety of personnel involved in this operation.
- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists is prohibited.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area.
- The use of waterless hand cleaning products is acceptable if followed by actual hand-washing as soon as practicable upon exiting the site.
- Avoid contact with potentially contaminated substances including puddles, pools, mud, or other such areas.
- Avoid, kneeling on the ground or leaning or sitting on equipment.
- Plan and mark entrance, exit, and emergency evacuation routes.

- Rehearse unfamiliar operations prior to implementation.
- Establish appropriate safety zones including support, contamination reduction, and exclusion zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Non-essential vehicles and equipment should remain within the support zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report injuries, illnesses, and unsafe conditions, practices, and equipment to the FOL/SSHO.
- Observe co-workers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

#### **9.33.9.1 Material Handling Procedures**

Tetra Tech personnel should notify supervisors or designated safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities, such that the Tetra Tech may evaluate safe operational procedures with regard to the required task.

- Proper lifting techniques (use of knees and not back) must be used when lifting any object:
- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift especially for heavy (>40 lbs.) or awkward loads.
  - If site personnel are not capable of lifting 40 lbs., seek assistance from a team member to split the load.
- Make sure the path of travel is clear prior to the lift.

#### **9.33.9.2 Drum/Container/Tank Handling**

During the execution of the contract, the only type of generated waste materials will be in the form of used PPE.

### **9.33.9.3 Comprehensive AHA of Treatment Technologies**

See Section 10.0 of the APP.

### **9.33.10 Site Control Measures**

This section outlines the means to delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas.

#### **9.33.10.1 Control Zones**

It is anticipated that a three-zone approach will be used during work at this site. This approach will be comprised of an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this approach will control access to site work areas, restricting access by the general public, minimizing the potential for the spread of contaminants, and protecting individuals who are not cleared to enter work areas. Site personnel entering the exclusion zone and contamination reduction corridor will log-in and log-out with the FOL/SSHO on a daily basis. This information will be kept in the FOL/SSHO project log book.

#### **9.33.10.2 Exclusion Zone**

The exclusion zone will be considered those areas of active operations plus an established safety zone depending on the task. Exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility site personnel and visitors, as necessary.

A pre-startup site visit will be conducted to identify proposed subsurface investigation locations, conduct utility clearances, and provide notices concerning scheduled activities.

#### **9.33.10.3 Contamination Reduction Zone**

The contamination reduction zone (CRZ) will be a buffer area between the exclusion zone and any area of the site where contamination is not suspected. This area will also serve as a focal point in supporting exclusion zone activities. This area will be marked using barrier tape, cones, and postings to inform and direct facility personnel. Decontamination will be conducted at a central location. Equipment potentially contaminated will be bagged and taken to that location for decontamination.

#### **9.33.10.4 Support Zone**

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The support zones will be established at areas of the site away from potential exposure to site contaminants during normal working conditions or foreseeable emergencies.

#### **9.33.10.5 Site Visitors**

Site visitors for the purpose of this document are identified as representing the following groups of individuals from:

- Personnel invited to observe or participate in operations by Tetra Tech
- Regulatory personnel (i.e., DoD, USEPA, OSHA)
- Authorized Navy Personnel
- Other authorized visitors

Non-Tetra Tech personnel working on this project are required to gain initial access to the base by coordinating with the Tetra Tech FOL or designee and following established base access procedures.

Site visitors will be escorted and restricted from approaching any work areas where they could potentially be exposed to hazardous chemicals. If a visitor has authorization from the client and from the Tetra Tech Project Manager to approach our work areas, the FOL must assure that the visitor first provides documentation indicating that he/she/they have successfully completed the necessary OSHA introductory training, receive site-specific training from the SSHO, and that they have been physically cleared to work on hazardous waste sites.

#### **9.33.10.6 Site Security**

Site security will be accomplished using Tetra Tech field personnel. Tetra Tech will retain complete control over active operational areas. As this activity takes place at a Navy facility open to public access, the first line of security will take place using exclusive zone barriers, site work permits, and any existing barriers at the sites to restrict the general public. The second line of security will take place at the work site referring interested parties to the Base Contact. The Base Contact will serve as a focal point for base personnel, interested parties, and serve as the final line of security and the primary enforcement contact.

### **9.33.10.7 Communication**

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crew members will not be necessary. External communication will be accomplished by using cellular telephones at approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities at the site, it is strongly recommended that cell signal strength be checked in the work areas and the relevant project phone numbers are programmed on site worker cell phones. The FOL will determine and arrange for telephone communication procedures. Workers should enter the emergency and important phone numbers from Table 9-1 in Section 9.2.4 into their cell phones prior to beginning work.

### **9.33.11 Personal Hygiene and Decontamination**

This section provides decontamination procedures and guidelines for developing site and activity specific decontamination procedures.

#### **9.33.11.1 Responsibilities**

The PHSO shall ensure that decontamination measures are adequately addressed in the Site Specific Health and Safety Plan. The FOL/SSHO is responsible for establishing a decontamination area. The FOL/SSHO also ensures that adequate decontamination procedures are followed to prevent contamination of individuals or the environment beyond the exclusion zone. The PM will ensure that sufficient information has been provided to the PHSO to prepare adequate decontamination procedures for inclusion in the SSHP.

#### **9.33.11.2 Decontamination**

Decontamination involves physically removing contaminants and/or converting them chemically into harmless substances. Decontamination, proper PPE donning procedures, and safety zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

The decontamination will consist of a soap/water wash and rinse for outer protective equipment (e.g., boots, gloves, PVC splash suits, etc.). This function will take place at an area adjacent to the drilling operations bordering the support zone.

This decontamination procedure will consist of:

- Equipment drop

- Soap/water wash and rinse of outer gloves and outer boots, as applicable
- Soap/water wash and rinse of the outer splash suit, as applicable
- Wash hands and face, leave contamination reduction zone

The FOL/SSHO will determine the organization and materials used. Factors that are considered include: the extent and type of hazard expected, meteorological conditions, topography, levels of protection selected, and availability of equipment and supplies.

#### **9.33.11.3 Contamination Avoidance**

Avoiding contamination is the first and best method for preventing the transfer of contamination to personnel or to non-contaminated areas. Each person involved in site operations must regularly practice the methods, listed below, for contamination reduction.

- Know the limitations of the protective equipment being used.
- Do not sit or lean against anything in a contaminated area.
- Waste containers should be checked for incompatible materials.
- Do not set sampling equipment directly on contaminated areas.
- Use the proper tools to safely conduct the job.

#### **9.33.11.4 Decontamination Guidance**

Personnel decontamination will consist of a soap/water wash and rinse for outer protective equipment (boots, gloves, splash suits, etc.). This function will take place at an area adjacent to the site activities.

Decontamination procedures will be reviewed with site personnel prior to entering the EZ. Each person will be given precise instructions and be acquainted with the procedure for moving through the decontamination line. Progress through the decontamination line will be deliberate, organized to minimize hazard contamination for personal.

#### **9.33.11.5 Closure of the Decontamination Line**

When the decontamination line is no longer needed, it will be closed down by site personnel. The disposable items used during the operation will be double-bagged and contained onsite, or removed to an approved off-site disposal facility. Decontamination and rinse solutions may be discarded onsite if approved by regulatory agencies. If not, they will be removed to an approved disposal facility. Reusable clothing should be dried and prepared for future use. If gross contamination had occurred, additional decontamination or disposal of these items may be required. Cloth items must be bagged and removed from the site for final

cleaning or disposal. Wash tubs, pails, containers, etc., must be thoroughly washed, rinsed, and dried before removal from the site.

### **9.33.12 Sampling Equipment Decontamination**

Sampling equipment will be decontaminated as stated per the requirements in the Work Plan. MSDS/SDS for any decontamination solutions (such as Alconox®, methanol, isopropanol, hexane, etc.) will be obtained and used to determine proper handling/disposal methods and protective measures (PPE, first-aid, etc.). The sampling equipment used will require a complete decontamination between locations and prior to removal from the site.

The equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.

The FOL/SSHO will be responsible for evaluating equipment arriving onsite and that which is to leave the site. Equipment will only be authorized access or exit with this authorization.

Evaluation will consist of a visual inspection to ensure that visible contamination has been effectively removed.

### **9.33.13 Emergency Equipment and First Aid**

The following emergency equipment will be strategically placed and maintained onsite:

- A first aid kit meeting the requirements of OSHA and EM 385-1-1, Section 03.B.01, will be readily available at each work site by having the kit available and ready for use.
  - The location of each first aid kit shall be clearly marked, and kits shall be protected from the weather and maintained clean.
  - The kit must contain all the items listed in Figure 9-4 Requirements for Basic Unit Packages (from Section 3 of the EM 385-1-1 Manual) and include one pocket mouthpiece or CPR barrier and latex gloves.
  - The kit will be inspected weekly and items shall be replaced as they are used.
  
- Eye wash units (or bottles of disposable eyewash solution) are maintained during sampling activities due to the small quantities of corrosive preservatives and well construction activities due to the caustic nature of the cement/grout products.
  - These units are acceptable due to extremely small quantity of the corrosives.

- These will be used as adjunct support until access to a fixed unit or the medical provider at Union Hospital.
- These units will be maintained in a clean location and inspected each week.
- Fire extinguishers will be maintained onsite and shall be immediately available for use in the event of an emergency. 2A:10BC for general support activities.
- If fuel will be transferred from portable fuel cans, they will be Underwriters Laboratory (UL) approved safety cans properly labeled.
  - If greater than 25 gallons is stored onsite a 5A:60BC fire extinguisher will be mounted within 50 feet of the fueling location.
- Fire extinguishers will be inspected monthly to ensure:
  - Sufficient charge
  - No physical damage
  - Tamper indicators are in place
  - Inspection tag documents inspection
- Site personnel will be trained in the use of the fire extinguisher as part of site specific training.

#### **9.33.13.1 First Aid**

Tetra Tech personnel will perform rescue operations from emergency situations and may provide initial medical support for injury/illnesses requiring only "Basic First-Aid and Cardio Pulmonary Resuscitation (CPR)" level support, and only within the limits of training obtained by site personnel.

Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location. Medical attention above First-Aid level support will require assistance from the designated emergency response agencies. At least two Tetra Tech site personnel will be trained to this level while working onsite.

#### **9.33.14 Emergency Response and Contingency Procedures**

In the event of an emergency during onsite work, the primary response action by onsite personnel will be to safely evacuate, assemble at an area unaffected by the emergency, and notify the POC. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person.

Site personnel will record any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets which will be filed onsite.

The local NSA Crane emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The POC will be notified if these response agencies are contacted.

Tetra Tech personnel will provide insipient emergency prevention activities such as:

- Initial (e.g., non-structural) fire-fighting support (fire extinguisher) and prevention
- Initial spill control and containment measures and prevention
- Evacuate personnel from emergency situations
- Initial medical support for injury/illness requiring only first-aid level support

#### **9.33.14.1 Pre-Emergency Planning**

Based on the nature of the planned activities, emergencies resulting primarily from physical hazards could be encountered. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following:

- Coordinating with the NSA Crane Emergency Response personnel prior to the commencement of work to ensure that Tetra Tech emergency action activities are compatible with existing emergency response procedures.
- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency.
- Creating and maintaining documents onsite that can be important in the event of an emergency situation, including:
  - A Chemical Inventory of hazardous chemicals onsite
  - Corresponding MSDS/SDS.
  - Completed Medical Data Sheets (Figure 9-2) for onsite personnel.
  - A log book identifying personnel onsite each day.
  - Hospital route maps with directions.

- Emergency Notification - phone numbers.

In the event of an onsite emergency, the FOL/SSHO will be responsible for the following tasks:

- Determining that an emergency situation exists, initiating a site evacuation, accounting for onsite personnel at the assembly area, and determining if/when return to work conditions resume.
- With assistance from the FOL/SSHO, educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention.
- With assistance from the FOL/SSHO, periodically performing practice drills to ensure site workers are familiar with incidental response measures.

#### **9.33.14.2 Personnel and Lines of Authority for Emergency Situations**

In the event of an emergency situation the FOL/SSHO will serve as the Incident Commander until the NSA Crane emergency services arrive on site. Other site personnel will provide support and follow direction from the Incident Commander.

#### **9.33.14.3 Criteria and Procedures for Emergency Recognition and Site Evacuation**

Emergency situations may be encountered during site activities.

##### 9.33.14.3.1 Emergency Recognition

Emergency situations that may be encountered during site activities will generally be recognized by visual observation. Visual observation will also play a role in detecting potential exposure events to chemical hazards. To adequately recognize chemical exposures, site personnel must have an awareness of signs and symptoms of exposure associated with the principle site contaminant of concern. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this SSHP and APP. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The FOL/SSHO will be responsible for performing and documenting surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Site personnel are responsible for reporting perceived hazardous situations.

The above actions will provide early recognition for potential emergency situations, and allow Tetra Tech to instigate necessary control measures. However, if the FOL/SSHO determine that control measures are

not sufficient to eliminate the hazard, Tetra Tech will withdraw from the site and notify the appropriate response agencies.

#### 9.33.14.3.2 Site Evacuation

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to the following: severe weather conditions; fire or explosion; and evidence of personnel overexposure to potential site contaminants.

In the event of an emergency requiring evacuation, personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification from the Tetra Tech FOL/SSHO. Safe places of refuge will be identified prior to the commencement of site activities and will be conveyed to personnel as part of the pre-activities training session. This information will be reiterated during daily safety meetings. Whenever possible, the safe place of refuge will also serve as the telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the Tetra Tech FOL/SSHO or the Emergency Response Team Incident Commander. The FOL/SSHO will perform a head count at this location to account for and to confirm the location of site personnel. Emergency response personnel will be immediately notified of any unaccounted personnel. The FOL/SSHO will document the names of personnel onsite (on a daily basis) in the site Health and Safety Logbook. This information will be utilized to perform the head count in the event of an emergency.

Evacuation procedures will be discussed during the pre-activities training session, prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

#### 9.33.14.3.3 Emergency Alarm Systems

Tetra Tech personnel will be working in close proximity to each other at SWMU 17. As a result, hand signals, two-way radio communications, voice commands, and line of site communication will be sufficient to alert site personnel of an emergency. When project tasks are performed simultaneously on different

sites, vehicle horns will be used to communicate emergency situations. If an emergency warranting evacuation occurs, the following procedures are to be initiated:

Initiate the evacuation via radio communications, hand signals, voice commands, line of site communication, or vehicle horns. The following signals shall be utilized when communication via vehicle horn is necessary:

<b>HELP</b>	three short blasts	( · · · )
<b>EVACUATION</b>	three long blasts	( — — — )

- Report to the designated refuge point.
- Once non-essential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe to the FOL/SSHO (who will serve as the initial Incident Coordinator) pertinent incident details.

**9.33.14.4 Decontamination and Medical Treatment of Injured Personnel**

Based on the nature of the planned activities and on the nature and extent of contamination that may be encountered during these activities, the need for any specific personal decontamination activities in an emergency medical situation is highly unlikely. In the unlikely instance that such efforts become necessary, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of the involved personnel. Decontamination will be postponed if the incident warrants immediate evacuation. As soon as possible and prior to transportation to a medical center the contaminated site worker will be:

- Washed and rinsed
- Contaminated clothing removed and disposed of as hazardous waste
- First aid treatment rendered

**9.33.14.5 Route Maps and Phone Numbers for Emergency Responders**

The closest hospitals are in Bloomington and Bedford. The Emergency Departments are open 24 hours a day, 365 days a year, and are equipped to treat all illnesses and injuries, whether minor, serious or life threatening. The routes to these hospitals are in Figure 9-1.

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 9-1 in Section 9.2.4 provides a list of emergency contacts and telephone numbers. This table must be posted where it is readily available to site personnel.

#### **9.33.14.6 Criteria for Alerting Local Community Responders**

In the event of an emergency situation, the FOL/SSHO will enact emergency notification procedures to secure additional assistance in the following manner:

- Dial emergency numbers listed in Table 9-1 and report the incident.
- Give the emergency operator the:
  - Location of the emergency
  - Type of emergency
  - Number of injured
  - A brief description of the incident.
- Stay on the phone and follow the instructions given by the operator.
- The operator will then notify and dispatch the proper emergency response agencies.

#### **9.34 BLASTING SAFETY PLAN**

Not applicable.

#### **9.35 DIVING PLAN**

Not applicable.

#### **9.36 CONFINED SPACE PROGRAM**

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. Therefore, personnel under the provisions of this APP are not allowed, under any circumstances, to enter confined spaces. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

## 10.0 RISK MANAGEMENT PROCESSES

Work conducted in support of this project will be performed using the Activity Hazard Analysis (AHA) process to guide and direct field crews on a task by task basis. It is the FOL/SSHO's responsibility to review the AHAs with the task participants as part of a pre-task tailgate briefing session.

Daily safety meetings will be conducted during site work and the task-specific AHA(s) will be reviewed prior to initiating any field activities. This effort will ensure that site-specific considerations and changing conditions are incorporated into the planning effort. Use of the APP will provide the line of communication for reviewing task-specific hazards and protective measures associated with each operation. The APP will be used as the primary reference for selecting levels of protection and control measures.

The FOL/SSHO is responsible for making the parties aware of the contents and requirements of the APP. Any problems encountered with the protective measures required will be documented and brought to the attention of the FOL/SSHO.

As an ongoing quality assurance effort, the FOL/SSHO will review operations to ensure the AHAs adequately address potential hazards for the tasks being conducted. Where deficient, they will be corrected and that information shared with the field personnel. Amended AHAs will be forwarded to the PHSO for inclusion in future APPs for similar activities. See Table 10-1.

- Mobilization/Demobilization
- Surface and subsurface soil sampling and soil/bedrock boring via:
  - Direct Push Technology (DPT)
  - Portable gasoline powered drill
  - Hand auguring
- Trench Excavation
  - Sediment trap (check dam) installation
- Decontamination of sampling and excavation equipment
- IDW management
- Vault/Pipeline CCTV Survey and Smoke Test
- Surveying via Global Positioning System (GPS)
  - Vegetation Management

		<h2>Activity Hazard Analysis</h2>					
<b>Activity/Work Task:</b> Mobilization - Demobilization		<b>Overall Risk Assessment Code (RAC)</b> (Use highest code)			L		
<b>Project Location:</b> SWMU 17, NSA Crane		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> N62470-08-D-1008		<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b> April 16, 2015			Frequent	Likely	Occasional	Seldom	Unlikely
<b>Prepared by:</b> J. Laffey, CESCO		Catastrophic	E	E	H	H	M
		Critical	E	H	H	M	L
<b>Reviewed by:</b> J. Carothers, PhD		Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L
<b>Notes:</b> (Field Notes, Review Comments, etc.)		Step 1: Review each <b>"Hazard"</b> with identified safety "Controls" and determine RAC (See above)					
		<b>"Probability"</b> is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					<b>RAC Chart</b>
		<b>"Severity"</b> is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					<b>E= Extremely High</b>
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					<b>H= High</b> <b>M= Moderate</b> <b>L= Low</b>

ACTIVITY / PHASE	HAZARDS	CONTROLS	RAC
<ul style="list-style-type: none"> <li>• Assembling equipment and supplies</li> <li>• Performing initial/exit inspections of the intended work areas</li> <li>• Arranging for utilities, site access, notifying appropriate client contacts</li> <li>• Performing equipment inspections of</li> </ul>	1. Heavy equipment	1. Conduct heavy initial site acceptance inspection prior to performing any work at this site. 2. Use the equipment inspection checklist for excavation equipment in Attachment II. Once the equipment passes inspection the AHA for Excavation Area Safety will be followed.	L
	2. Minor cuts, abrasions or contusions	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	L
	3. Heavy lifting (muscle strains and pulls)	1. Practice safe lifting techniques. Use mechanical lifting devices such as a dolly whenever possible 2. Ensure clear path of travel. 3. Have a good grasp on object. Perform "test lift" to gauge ability to safely make the lift. 4. Lift with legs not back. Obtain help when needed to lift large, bulky, or heavy items).	L

ACTIVITY / PHASE	HAZARDS	CONTROLS	RAC
vehicles and equipment arriving/preparing to leave the site  • Conducting site geographic surveys	4. Vehicular traffic when moving large equipment to the support area	1. Designate and mark vehicle and equipment staging areas. Inform the site personnel of heavy equipment areas and of their responsibility to stay clear of moving vehicles. 2. In high traffic areas, wear a high-visibility vest, shirt or jacket.	L
	5. Slips, Trips, Falls	1. Watch for tree branches, roots, weeds, limbs and other ground hazards. 2. Wear appropriate foot protection to prevent slips and trips. 3. Use caution when working on uneven and wet ground surfaces.	L
	6. Intermittent high noise levels	1. Site personnel are to wear hearing protection if noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approximately 2 feet) of them. 2. FOL/SSHO is responsible for determining and designating when hearing protection is required. 3. Hearing protection is to consist of either ear muffs or plugs that have a noise reduction rating (NRR) of at least 25 decibels (dB).	L
	7. Inclement weather	1. The FOL and/or the SSHO will temporarily suspend outside activities in the event of electrical storms or high winds. 2. It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed. 3. Electrical/Thunderstorms – Where possible employ a lightning detection equipment to warn field personnel of approaching storms. <ul style="list-style-type: none"> <li>• You are <b>not safe</b> anywhere outside.</li> <li>• Run to a safe building or vehicle when you first hear thunder, see lightning or observe dark threatening clouds developing overhead.</li> <li>• Stay inside until 30 minutes after you hear the last clap of thunder.</li> <li>• Do <b>not</b> shelter under trees.</li> </ul>	L
	8. Implement Site Specific Hazard Communication Program	1. Complete the chemical inventory for the project. 2. Procure SDSs for chemicals used exclusively on this project. 3. Label containers used onsite for hazardous materials. 4. Identification of any additional hazard communication training requirements.	L

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (dollies, hand carts, hand knives, etc.)	Visual inspection prior to use by user.	Review of AHA during pre-task tailgate safety briefing with the intended task participants.
<b>Personal Protective Equipment Minimum:</b> Safety toe boots, safety	Initial PPE inspection performed by FOL/SSHO. Ongoing (prior to	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
glasses. Optional items: Hardhat, hearing protection. <b>HTRW:</b> None anticipated for this task.	each use) inspections responsibilities of PPE users.	HAZWOPER training, which is to be verified by the FOL/SSHO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date



## ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> Surface and subsurface soil sampling and soil/bedrock boring via: DPT, portable gasoline powered drill, or hand augering.	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>	<b>L</b>																																		
<b>Project Location:</b> SWMU 17, NSA Crane																																				
<b>Contract Number:</b> N62470-08-D-1008	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2" style="width: 15%;">Severity</th> <th colspan="5">Probability</th> </tr> <tr> <th style="width: 15%;">Frequent</th> <th style="width: 15%;">Likely</th> <th style="width: 15%;">Occasional</th> <th style="width: 15%;">Seldom</th> <th style="width: 15%;">Unlikely</th> </tr> <tr> <td style="background-color: #f08080;">Catastrophic</td> <td style="background-color: #ff0000;">E</td> <td style="background-color: #ff0000;">E</td> <td style="background-color: #ffa500;">H</td> <td style="background-color: #ffa500;">H</td> <td style="background-color: #ffff00;">M</td> </tr> <tr> <td style="background-color: #ffa500;">Critical</td> <td style="background-color: #ff0000;">E</td> <td style="background-color: #ffa500;">H</td> <td style="background-color: #ffa500;">H</td> <td style="background-color: #ffff00;">M</td> <td style="background-color: #90ee90;">L</td> </tr> <tr> <td style="background-color: #90ee90;">Marginal</td> <td style="background-color: #ffa500;">H</td> <td style="background-color: #ffff00;">M</td> <td style="background-color: #ffff00;">M</td> <td style="background-color: #90ee90;">L</td> <td style="background-color: #90ee90;">L</td> </tr> <tr> <td style="background-color: #90ee90;">Negligible</td> <td style="background-color: #ffff00;">M</td> <td style="background-color: #90ee90;">L</td> <td style="background-color: #90ee90;">L</td> <td style="background-color: #90ee90;">L</td> <td style="background-color: #90ee90;">L</td> </tr> </table>	Severity	Probability					Frequent	Likely	Occasional	Seldom	Unlikely	Catastrophic	E	E	H	H	M	Critical	E	H	H	M	L	Marginal	H	M	M	L	L	Negligible	M	L	L	L	L
Severity			Probability																																	
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<b>Notes: (Field Notes, Review Comments, etc.)</b>	<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)</p> <p>"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.</p> <p>"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>																																			

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

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
DPT Drill Rig Site Set Up  Tetra Tech personnel vehicle operation and mobilization.	<ul style="list-style-type: none"> <li>Accidents and injuries resulting from the transport of the drill rig and associated equipment to the site.</li> <li>Material falling from the drill rig during transport.</li> </ul>	<ol style="list-style-type: none"> <li>1. The vehicle operator will perform a walk around inspection to ensure all equipment, augers, rods and tools will be properly secured for/during transport.</li> <li>2. Turn signals brake lights, etc. all function properly.</li> <li>3. There are no materials carried or stored in the cab that will interfere with the safe operation of this motor vehicle on the highways (garbage in and around the pedals).</li> <li>4. All critical fluid levels (brake fluid, motor oil, anti-freeze) are at their recommended levels.</li> <li>5. Seat belts are functioning properly.</li> <li>6. Mirrors are properly adjusted.</li> <li>7. Cell phone use during driving is prohibited unless a hands free device is used.</li> <li>8. If the vehicle weight is greater than 26,001 pounds, the operator will have a Commercial Driver's License (CDL).</li> <li>9. If the vehicle has air brakes, the CDL will have an air brake endorsement.</li> <li>10. The vehicle will be operated within DOT or facility specific guidelines including adhering to the speed limit obeying all posted signs.</li> <li>11. Where necessary, use escort vehicles with flashing lights to warn and control local traffic when moving large equipment to support area.</li> <li>12. Practice defensive driving whenever traveling in a vehicle</li> <li>13. Ensure you have an Orange Vest and a Reflective Triangle in your vehicle at all times along with an Incident Reporting Form IR-C and a disposable camera (phone cameras</li> </ol>	<b>L</b>

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		are acceptable). 14. Keep a safe distance between cars (Use the 4-second rule).	
Preparing the Drill Rig for Use	Injury due to the failure of faulty equipment	1. The FOL, SSHO, and/or a designated "Qualified Person" will determine the operating integrity of the drill rig through the completion of an Equipment Inspection Checklist for Drill Rigs provided in Attachment III Site mobilization/demobilization AHA. 2. These checklists will be used to ensure that back-up alarms are functional, that all moving parts are guarded if such parts are exposed, that all emergency stop controls on equipment have been tested and are functional.	L
Personnel qualifications/ equipment integrity	Injury due to Improper operation	1. Ensure the driller or driller's helper responsible for the transport and/or operation are qualified to do so. 2. This will be determined through the examination of <ul style="list-style-type: none"> <li>• Licenses or certification indicating they are thoroughly trained and competent to perform their assigned task with the equipment used in investigation.</li> <li>• Oversight and monitoring of active operations.</li> <li>• Where deficiencies are noted, these will be identified, and corrected immediately.</li> <li>• If necessary these conditions will also be reviewed during the Tail-Gate Training sessions conducted periodically.</li> </ul> 3. If consistent poor work habits are employed, personnel will be removed and replaced as determined to be necessary	M
Positioning Unit (engaging outriggers. etc.)	Struck by/ Rig stability	1. When moving the drill rig into place: 2. Prior to committing personnel and/or resources, the FOL and/or the SSHO will examine the intended work area to select travel route, placement of the drill rig, and to ensure any potential hazards within the designated work area are eliminated or at least demarcated. 3. The operator in concurrence with the FOL and/or the SSHO should select the best possible approach vantages to move the unit up the slope or around physical obstructions to the selected boring location. 4. Preview travel paths and set up location for subsurface utilities, soft spots, curbs, etc. These items may affect the stability of the rig during operation. Use pads for outriggers to avoid potentially damaging subsurface utilities or to control subsidence during drilling. 5. Operate the unit at a suitable rpm for the terrain and conditions. Furthermore, 6. Ground spotters will be used to move the rig into place to avoid damaging subsurface process lines or overhead power lines. 7. During the time of directing equipment into place <ul style="list-style-type: none"> <li>• Do not place yourself between the rig and an immovable object.</li> <li>• Stay within the operator's line of sight.</li> <li>• Keep all non-essential personnel out of the area.</li> <li>• Do not create distractions when placing the rig by requesting information or the attention of the spotter.</li> </ul>	M

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ul style="list-style-type: none"> <li>• Only one person will direct the actions of the operator.</li> <li>8. The DPT Drill Rig Outriggers (where applicable – depending on manufacturer) that is equipped with outriggers to provide stability to the unit during drilling operations.</li> <li>9. There are a number of factors that can influence the outriggers ability to provide this stability including:                             <ul style="list-style-type: none"> <li>• Are the outriggers fully extended?</li> <li>• Are outrigger pads used to increase the area in which the outriggers are applying pressure? If not cribbing can be used to increase the foot print size.</li> <li>• Is the ground surface in the area of the outrigger placement adequately compacted to support the drill rig?</li> <li>• If not materials can be haul in and compacted to add additional stability.</li> <li>• This may be prevalent where soil borings and test pitting locations overlap.</li> <li>• Ensure the drilling site foundation is stable and as level as possible.</li> <li>• The drill rig is never to be moved unless the mast is fully down and the outriggers are fully retracted.</li> </ul> </li> </ul>	
Pre – Drilling Excavation clearance	1. Utility Damage, injury and property damage	<ol style="list-style-type: none"> <li>1. An excavation or dig permit will be required anytime the ground surface is broken using a mechanized piece of equipment.</li> <li>2. Mark the areas to be drilled in White Paint –</li> <li>3. Also identify it as the area for One-Call</li> <li>4. Contact the Indiana Underground Plant Protection Service at 811.</li> <li>5. Where possible provide drawings and/or coordinates.</li> <li>6. Upon receipt of your permit, make sure all utility owners in the area have responded back.</li> <li>7. During site preparation the discussion was provided concerning the site walk over to inspect for surface monuments that would be indicative of buried utilities.</li> <li>8. During this site walk over you are also examining the area for overhead utilities. The dig permit has NOTHING to do with overhead power lines. DO NOT approach overhead power lines closer than 20-feet.</li> <li>9. Follow NSA Crane Utility Clearance Procedures.</li> <li>10. The Tetra Tech SOP Utility Location and Excavation Clearance can be found in Attachment II.</li> </ol>	L
	2. Lifting, back related injuries and smashed fingers	<ol style="list-style-type: none"> <li>1. Use proper lifting techniques when manually handling rods, augers and tools.</li> <li>2. Use mechanical equipment during lifting whenever possible (hoisting devices).</li> <li>3. Use the buddy system when lifting tools and supplies.</li> <li>4. Stretch in the morning to limber your muscles, tendons, and ligaments prior to engaging in heavy lifting activities.</li> <li>5. Take more breaks in the afternoon to guard against fatigue related injuries.</li> </ol>	L
Drill Rig Operation	1. Excessive Occupational Noise	<ol style="list-style-type: none"> <li>1. Noise levels associated with DPT drilling rigs have ranged from 92 to 107dBA during percussion hammering.</li> <li>2. Due to the magnitude of these levels provisions for hearing protection is required.</li> </ol>	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ol style="list-style-type: none"> <li>3. Unit operator and helper(s) are to wear hearing protection.</li> <li>4. Other persons who must be nearby (within the 35-foot exclusion zone) to perform their job duties are to also wear hearing protection.</li> <li>5. Onsite personnel may use the general rule of thumb when determining if noise levels are excessive                             <ul style="list-style-type: none"> <li>• <i>If noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approx. 2') of them then noise levels are becoming excessive and hearing protection should be employed.</i></li> </ul> </li> <li>6. The SSHO responsible for monitoring the use of hearing protection, ensuring the hearing protection selected have a sufficient noise reduction rating (at least 25 dB).</li> </ol>	
	2. Exposure to site contaminants	<ol style="list-style-type: none"> <li>1. The use of area wetting will be employed to control visible airborne dust.</li> <li>2. Wear surgeons gloves when handling potentially-contaminated media and samples,</li> <li>3. Avoid contact with potentially-contaminated media to the extent possible,</li> <li>4. Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area, hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.).</li> <li>5. Practice good housekeeping to avoid the spread of contamination.</li> <li>6. Work from the least contaminated toward the source to avoid potential cross contamination</li> <li>7. Area wetting will be employed to control visible dust emissions.</li> </ol>	L
Drill rig maintenance activities	1. Struck by, entanglement, crushed	<ol style="list-style-type: none"> <li>1. The drill rig and associated equipment must be maintained in a proper functioning condition.</li> <li>2. Site equipment must be visually inspected daily prior to use.</li> <li>3. Motors must be shut off and electrical, mechanical and hydraulic components locked out of service when making repairs.</li> <li>4. All components where work will be conducted or associated with will be reduced to a zero mechanical state (NO POTENTIAL or KINETIC energy).</li> <li>5. Bleed off pressure on hydraulic lines before undoing fittings. Do not leave tools or parts loose on the unit after maintenance has been performed.</li> <li>6. Equipment must be operated and maintained in accordance manufacturer's guidelines.</li> <li>7. Safety shutoff system must be tested daily and not disabled.</li> </ol>	L
	2. Fire	<ol style="list-style-type: none"> <li>1. All motors must be shut off during refueling.</li> <li>2. Smoking in the vicinity of the drill rig, within the exclusion zones, or areas of the facility are not permitted.</li> <li>3. Smoking will only be permitted in designated areas.</li> <li>4. Fuel containers will not be stored within 10' of the unit motor or other elevated temperature application.</li> <li>5. Fuel will be stored in UL approved safety containers with contents clearly labeled.</li> <li>6. Fire suppression devices will include:                             <ul style="list-style-type: none"> <li>• Water source</li> </ul> </li> </ol>	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ul style="list-style-type: none"> <li>• Portable fire extinguisher(s) 2:A-B-C fire extinguisher must be maintained onsite and on associated motorized equipment.</li> <li>• The number of fire extinguishers will be determined by the SSHO.</li> </ul> 7. Combustible materials will be removed from the intended work area.	
Shaw Portable Gasoline Powered Backpack Drill	1. Equipment malfunction	1. Prior to use, always inspect the unit for defects or damage 2. Check inside the swivel sleeve to ensure that the six Teflon impregnated rotational quad rings are lubricated with silicone grease. 3. Check water tanks, either compression bottles for backpack access only, or larger vehicle mounted tanks with electric pumps. 4. Ensure water hoses are in good condition and not leaking	L
	2. Back strain	1. Ensure that the equipment operator is physically capable to perform this activity. 2. Inspect the area for obstructions such as roots or debris. 3. Wear gloves, safety toe shoes, and safety impact eye protection 4. Adjust belts and straps to result in a pack which exerts its weight (50 lbs.) primarily on the user's hips rather than on their shoulders. 5. The pack should be snug to the body, but not uncomfortably tight, and ride as high as possible on the wearers back. 6. Avoid injury by stopping if strong resistance is encountered (such as if impassable rocky conditions are encountered) 7. Take breaks as needed and consume adequate water for the weather conditions. 8. Use proper lifting techniques when handling water containers.	L
	3. Fire	1. Obtain a Hot Work Permit from NSA Crane before deploying this unit. <ul style="list-style-type: none"> <li>• Call Base POC, Thomas Brent</li> </ul> 2. Mix two stroke engine oil with regular gasoline in a ratio of 30 parts gasoline to 1 part engine oil in a UL approved safety containers with contents clearly labeled. 3. Follow manufacturer's instructions for refueling 4. Equipment must be shut off during refueling. 5. Smoking only permitted in designated areas. 6. Fuel containers will be stored further than 10 feet of the motor. 7. Fuel will be stored in the UL approved container 8. Fire extinguisher(s) must be maintained onsite.	L
	4. Struck by	1. Ensure that the diamond bit is in good condition and attached properly. 2. Check that either the stainless steel or aluminum tube bodies and in good condition and that the extensions are the main building units of the drill string. 3. Connect each piece properly and make sure the connection is secure. 4. Follow the manufacturer's instructions during operations and if the core tube gets stuck.	L

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Drill Unit, Sampling tools and attachments.</p> <p>Shaw Portable Gasoline Powered Backpack Drill, water containers and other accessories.</p> <p>Hand tools</p>	<p>Drill Rig Inspection</p> <ul style="list-style-type: none"> <li>• Inspect unit as part of site mobilization, after maintenance/repair.</li> <li>• Visual examination daily.</li> <li>• Test emergency shutoff switches daily, where applicable</li> </ul> <p>FOL and/or the SSHO will conduct initial site surveys of all work areas prior to committing personnel and/or equipment. Hazards will be eliminated or demarcated. All hazards identified will be discussed at the Tail Gate training session prior to entering the work site.</p>	<p>SSHO or designated "Qualified Person" must be sufficiently experienced and familiar with units to conduct a detailed inspection concerning the units operating integrity. The Driller will carry the necessary certification or licensing as required by the State of Indiana. This license/certification will be maintained onsite.</p> <p>For drilling activities employed to determine levels of contamination in the soils and/or groundwater</p> <ul style="list-style-type: none"> <li>• 40-Hour General Site Worker Hazardous Waste Operations Training</li> <li>• 8-Hour General Site Worker Refresher Training - If it has been greater than 12 months since receiving the 40-hour training or last refresher training.</li> <li>• 8-Hour Supervisory Training [29 CFR 1910.120 (e)(4)] for all personnel operating within the supervisory capacity.</li> <li>• Site-Specific Training – All personnel performing work within designated exclusion zones will have gone through site specific training including                         <ul style="list-style-type: none"> <li>○ Reviewing the contents of the site specific Health and Safety Plan</li> <li>○ Applicable sections of the HSGM.</li> <li>○ Work Plan</li> </ul> </li> <li>• Tail Gate Training Sessions</li> </ul>
<p>Hand tools (dollies, hand carts, hand knives, shovels, etc.)</p> <p>Emergency Equipment –</p> <p>Fire Extinguishers</p> <p>First Aid (with Bloodborne Pathogen provisions)</p> <p>Eye wash units</p>	<p>Visual inspection prior to use by user.</p> <p>Upon receipt then monthly thereafter</p> <p>The SSHO will be responsible for insuring the first aid kits are fully stocked and replenished as supplies are used.</p> <p>The SSHO will be responsible for inspecting the onsite Emergency Eyewash units upon receipt then weekly thereafter.</p>	<p>None required</p> <p>All personnel will have received fire extinguisher training for the types of extinguishers to be employed. This will be through their respective companies or as part of the site-specific training.</p> <p>All personnel designated as first aid providers will have had formal training in first aid and CPR as well as in Bloodborne Pathogen (BBP) control and program elements.</p>
<p><b>Personal Protective Equipment: <u>Minimum:</u></b>                      Steel toe boots, safety glasses, hardhat, hearing protection cotton or leather gloves when handling drill tooling; Nitrile with grip support for handing contaminated tooling.</p>	<p>Initial PPE inspection will be performed by the user (prior to each use).</p> <p>The SSHO will monitor use/ application of PPE by the users. The SSHO will address any deficiencies noted at the occurrence then at Tail Gate Safety Meetings.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSHO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>This is a general component of 40 hour HAZWOPER training, and SSHO must become very familiar with the Operator's Manual for any instrument used.</p>

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p><b>HTRW:</b> Nitrile gloves when handling samples or other potentially-contaminated media.</p>		

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA.

Name (Printed)	Signature	Occupation	Date Reviewed/Training



## ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> Trench Excavation and Sediment Trap Installation	<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>M</b>		
<b>Project Location:</b> SWMU 17 NSA Crane							
<b>Contract Number:</b> N62470-08-D-1008	<b>Severity</b>	<b>Probability</b>					
<b>Date Prepared:</b> April 16, 2015		Frequent	Likely	Occasional	Seldom	Unlikely	
<b>Prepared by:</b> J. Laffey, CESCO		<b>Catastrophic</b>	E	E	H	H	M
<b>Reviewed by:</b> J. Carothers, PhD		<b>Critical</b>	E	H	H	M	L
		<b>Marginal</b>	H	M	M	L	L
	<b>Negligible</b>	M	L	L	L	L	
<b>Notes: (Field Notes, Review Comments, etc.)</b>	<p>Step 1: Review each <b>"Hazard"</b> with identified safety <b>"Controls"</b> and determine RAC (See above)</p> <p><b>"Probability"</b> is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.</p> <p><b>"Severity"</b> is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each <b>"Hazard"</b> on AHA. Annotate the overall highest RAC at the top of AHA.</p>						
	<b>RAC Chart</b>						
					<b>E= Extremely High Risk</b>		
					<b>H= High Risk</b>		
					<b>M= Moderate Risk</b>		
					<b>L= Low Risk</b>		

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
Operator Qualification	Dangerous or improper operation; struck by	<ol style="list-style-type: none"> <li>Operator will provide certification of competency (training certification, union card, etc.) in the equipment type to be operated; attested by an officer of the company that he/she is competent in that type of equipment, and will demonstrate operator competency in the field.</li> <li>The operator will be fully responsible for his/her actions resulting in injury or property damage resulting from erratic or unsafe operation.</li> <li>The operator will be medically qualified to operate the equipment.</li> <li>Deficiencies in eyesight, hearing or overall health will restrict using this person if others are put at risk.</li> </ol>	L
Performing Equipment Inspections	Flying projectiles; cuts and lacerations; pinch/compressions; struck by	<ol style="list-style-type: none"> <li>Complete the Equipment Inspection Checklist for Heavy Equipment has been provided in Attachment III.</li> <li>Equipment maintenance will be performed using manufacturer approved parts.</li> <li>The following PPE will be required for this initial activity: <ul style="list-style-type: none"> <li>Hard hat</li> <li>Safety Glasses</li> <li>Leather/high visibility work gloves</li> <li>Sleeved shirt, long pants (avoid loose or bagging clothing)</li> <li>Steel toed/shank over the ankle workboots</li> </ul> </li> <li>Potential and kinetic energy sources will be secured or controlled during inspection</li> </ol>	L
	High pressure hydraulic lines – Struck by hazards	<ol style="list-style-type: none"> <li>All high pressure air and hydraulic lines that do not have mechanical threaded connections will have connections pinned and will be equipped with a whip check to minimize the lines thrashing should they become disconnected.</li> </ol>	M

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		2. Maintain adequate clearance (fully extended boom + 10-feet during operational checks and demonstration.	
	Hydraulic fluid release – A hydraulic line that ruptures can	1. Attention will be focused on connection points 2. Condition of the hoses <ul style="list-style-type: none"> <li>• Damaged steel braids</li> <li>• Areas of friction wear patterns</li> <li>• Damage or deterioration to the rubber protective outer coating (indicative of overheating)</li> </ul> 3. Suspected poor condition hoses will be replaced. 4. Oil spill pads will be carried on the excavator/back-hoe or in the support vehicle immediately accessible.	M
	Electrocution during utility strike	1. If the terrain permits, the use of a sand bar or similar flat cutting edge on the bucket is recommended to avoid snagging potential buries utilities. 2. If utilities are in the general area, within 5-feet or intersect the trench, move the trench. 3. If there is no choice, then hand digging is required when working within the diameter of the utility + 5-feet to locate the utility also known as pot-holing.	L
Pre-Excavation Site Preparation	Utility Contact or Damage Subsurface and overhead power lines	1. These entries have been marked RED as should this take place, this is considered an emergency and will require public works assistance from NSA Crane. 2. Utility clearance will be completed for the area in which the test pits are to be installed. This will included <ul style="list-style-type: none"> <li>• Notify NSA Crane Public Works</li> <li>• Pit locations and dimensions painted on the ground using white paint and or flags to delineate the boundaries.</li> <li>• Passive methods for anomaly and utility detection will be employed as discussed in Attachment II.</li> </ul> 3. These passive methods include personnel will perform site walkovers to examine the surface, for surface monuments including: <ul style="list-style-type: none"> <li>• Valve or meter boxes</li> <li>• Manhole covers</li> <li>• Direction cable boxes</li> <li>• Utilities entering or exiting buildings.</li> <li>• Storm water manhole covers</li> </ul> 4. In the areas in which the boom and superstructure will be rotated will be examined for the existence of overhead power lines or obstructions (buildings, signs, foundations, etc.). 5. The FOL/SSHO will determine the necessary boundary at each work location: 6. To determine site control boundary for the Excavator/Back-Hoe Operations: <ul style="list-style-type: none"> <li>• The length of a fully extended boom + 10 feet. The boom will be fully extended to determine distance. Cones, caution tape, or other suitable markers will be employed.</li> </ul> 7. Establish an emergency evacuation point and secondary point and communicate its location during the Daily Tail Gate meeting.	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
Preparing the site for work activities.	Struck By; tip over; backing; electrocution; explosion	<ol style="list-style-type: none"> <li>1. Equipment that can be moved over the road will be equipped with slowing moving triangle or emblem for such activity.</li> <li>2. All equipment moved using truck and transport will be <ul style="list-style-type: none"> <li>• Sufficiently chained and ratcheted</li> <li>• Driver will be qualified to operate the vehicle combination weight including CDL endorsement with air brakes.</li> </ul> </li> <li>3. All vehicles and equipment to be employed on roads and highways will comply with DOT requirements.</li> <li>4. Use a ground guide along with a functioning back-up alarm during equipment backing to avoid striking objects or backing into pits and/or ditches (over embankments).</li> </ol>	L
	Slip, trips, and falls	<ol style="list-style-type: none"> <li>1. Practice good housekeeping to keep the ground around the excavation area.</li> <li>2. Use caution when working on uneven and wet ground surfaces</li> </ol>	L
Walking in area around excavation.	Slips trips and falls walking in general area of intended excavation.	<ol style="list-style-type: none"> <li>1. Review general terrain and identified surface conditions.</li> <li>2. Look for ruts, larges rocks and uneven terrain.</li> <li>3. If focus on instrument distracts excessively from attention to terrain, have an assistant help spot hazards in area.</li> <li>4. If lifting or pushing scanning instruments of heavier weights, get help with movements to avoid strains.</li> </ol>	M
	Falling into trench or trench collapses	<ol style="list-style-type: none"> <li>1. At no time will Tetra Tech employees be permitted to enter unprotected area of the excavation.</li> <li>2. Watch for barricaded areas that indicate the swing radius of the excavator to prevent being struck by or crushed between injuries at the rear of the equipment.</li> <li>3. Only authorized persons will be allowed within 6 feet of the excavation.</li> <li>4. At a minimum, barricades shall be erected six feet from the edge of the trench.</li> <li>5. Anyone working within the six foot boundary and not entering the trench must be protected with fall protection.</li> <li>6. Methods of fall protection can be: <ul style="list-style-type: none"> <li>• OSHA approved railing or fall restraint by tethering workers so that they cannot approach the trench close enough to fall in.</li> <li>• Attachment must withstand four times the anticipated load a person would exert walking to the trench or leaning to see in.</li> </ul> </li> </ol>	M
Digging test trenches – <ul style="list-style-type: none"> <li>• Sampling soils</li> <li>• Examining artifacts from test trenches</li> </ul>	Struck by/ caught between	<ol style="list-style-type: none"> <li>1. Personnel will remain a distance of the fully extended boom + 10 feet during excavation.</li> <li>2. Personnel will not place themselves between operating equipment and immovable objects.</li> <li>3. The sampler will signal the operator to collect soils from a specified area in the trench. The operator will collect the soils and swing the bucket to the left side of the trench and set it on the ground. <ul style="list-style-type: none"> <li>• At this time the operator will disengage the controls and signal the sampler to approach and collect the sample.</li> </ul> </li> <li>4. Upon completion of the sample collection, the sampler will move outside the zone.</li> <li>5. The operator will not re-engage the controls until such time the operator is outside of the exclusion zone boundary.</li> <li>6. Soil sampling from the spoils pile will proceed in the same manner.</li> </ol>	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		7. During which time the samples are being collected the operator will cease excavating until such time the samples are collected and the sampler is outside of the exclusion zone.	
	Noise	1. Keep occupational noise levels from exceeding 85dB. 2. Keep the cab closed, this will reduce external input. 3. Wear hearing protection for units without cabs (not recommended) or during the operation of excessively loud machinery or machinery with loose connections (resulting in banging) of the steel components. 4. Operating at excessively high rpms. 5. Use the general rule of thumb <ul style="list-style-type: none"> <li>• If you must raise your voice to be heard by someone standing at arm's length away, then excessive levels are being approached and hearing protection should be employed.</li> </ul> 6. The SSHO will complete the onsite hearing conservation program when hearing protection is employed.	L
	Chemical exposure.	1. Airborne dust clouds will be controlled through area wetting to knock down dust clouds and through the operators ability to place the bucket into the spoils pile and empty thereby not dumping from above creating dust plumes. 2. As the operator is of primary concern as he/she cannot move, the following measures will also be employed: <ul style="list-style-type: none"> <li>• Position where possible the back-hoe/excavator upwind. Use a wind sock or similar wind direction indicating device to determine the wind direction.</li> <li>• Close the cab, use area wetting</li> <li>• Request that the cab filter be changed prior to excavation.</li> <li>• Keep the equipment clean especially inside the cab – Vacuum or wet clean the inside.</li> <li>• No eating drinking or associated hand to mouth activities while in the machine.</li> <li>• Employ good work hygiene practices; diligent decontamination to minimize contaminant exposure.</li> </ul> 3. During back filling, replace soils into the trenches in the lifts in which it was removed. 4. This will permit soils to be placed back in intervals where contamination may have existed without mixing levels/intervals. 5. That way if removal action is required minimal materials at specified depths can be removed	L
Digging test trenches; Site Restoration	Excavation collapse	1. Stack/place spoils at least 2-feet from the excavation edge. This will aid in minimizing sidewall loading. 2. Dig the trench as plumb as possible to avoid, overhanging/loading of a sidewall may cause a collapse. Where necessary to support the excavation stability, bench the top four feet back to permit greater stability. 3. Persons will remain at least 2-feet from unsupported edges, unless, a supported platform with hand rails are employed. 4. If possible, the excavation will not proceed any closer than 5-feet to a utility, foundation, or other surface encumbrance to avoid collapse and damage to these structures.	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ol style="list-style-type: none"> <li>5. Personnel will examine the excavation for zones of weak (class C soils); evidence of fractures or fissures; horizontal longitudinal cracks and previously disturbed soils indicating potential collapse.</li> <li>6. Vibration or traffic control in and around the excavation that may predispose sidewalls to collapse.</li> <li>7. To the extent possible this will be minimize through creating alternate traffic patterns should it be required.</li> <li>8. Weather conditions that may affect the sidewall stability through excessive rains or dryness.</li> <li>9. A ladder sufficient length to provide emergency exit should someone fall in will be maintained onsite.</li> </ol>	
	Slip, trip, and fall	<ol style="list-style-type: none"> <li>1. During back filling the replacement materials will be placed in approximately 1-foot to 1.5 feet lifts and compacted with the bucket. This will minimize settling that may create slip, trip, and fall hazards.</li> <li>2. Test Trenches will not be left unattended. If they are, construction fencing will be installed supporting closure on all sides.</li> <li>3. If trenches are left open overnight, the trench will be fenced on all sides with low intensity blinking lights on all approach routes.</li> <li>4. Signs will be placed on all approach routes indicating – OPEN EXCAVATION – Signs will be black and yellow.</li> <li>5. If trenches are left open the ends will be sufficiently sloped to allow egress.</li> </ol>	L
	Confined spaces/ excavation safety	<ol style="list-style-type: none"> <li>1. Any excavation deeper than 4-feet will be considered a confined space.</li> <li>2. Under no circumstances are personnel permitted to enter a confined space or an open excavation.</li> </ol>	L
	Inclement weather	<ol style="list-style-type: none"> <li>1. To detect electrical/thunderstorms use a lightning detection equipment to warn field personnel of approaching storms.</li> <li>2. Electrical/Thunderstorms – Where possible employ a lightning detection equipment to warn field personnel of approaching storms. <ul style="list-style-type: none"> <li>• You are not safe anywhere outside.</li> <li>• Run to a safe building or vehicle when you first hear thunder, see lightning or observe dark threatening clouds developing overhead.</li> <li>• Stay inside until 30 minutes after you hear the last clap of thunder.</li> <li>• Do not shelter under trees.</li> </ul> </li> <li>3. The survey team leader shall assess heavy rains/ storms and determine whether work will continue.</li> </ol>	L

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Excavator/back-hoe Fence post driver and fence posts and	Complete Heavy Equipment Checklist and any hand tools to be used. Tools will be tagged with	All personnel: <ul style="list-style-type: none"> <li>• 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)]</li> <li>• 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)]</li> </ul>

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>construction fencing Hand tools (hand knives, carpenter tools, fixed and portable ladders, zip ties, etc.)</p>	<p>colored electrical tape. Green tape ok for use. Red tape do not use. All red taped items should be repaired or removed from the site. Each time a tool is used it will undergo a cursory inspection by the user. Noted damage (mushroomed head, splintered handle, etc.) will require removal from service.</p> <p>FOL and SSHO to perform regular (e.g., daily) inspections for housekeeping issues. The results of these efforts will be documented in the Field Logbook</p>	<ul style="list-style-type: none"> <li>• Site Specific Training – All personnel shall review this Abbreviated Health and Safety Plan prior to the commencement of on-site activity.</li> <li>• Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f).</li> <li>• Complete a Medical Data Sheet</li> <li>• Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout.</li> </ul> <p>Supervisory personnel:  8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)]</p> <p>Certification of Equipment Operation – Training documentation; letter from the company; union qualification</p> <p>It is recommended that personnel review potential excavation hazards, so they may recognize and avoid.</p>
<p><b>Personal Protective Equipment: <u>Minimum</u>:</b>  Steel toed work boots; hardhats, safety glasses, work gloves; suitable work attire (long pants; sleeved shirts.  High visibility vest and gloves, Hearing protection  <b>HTRW:</b> PCBs.  Note: Personnel may be required to meet location specific PPE requirements.</p>	<p>Initial PPE inspection performed by SSHO. Ongoing (prior to each use) inspections responsibilities of PPE users.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSHO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>The SSHO will be responsible for the implementation of the following Site Specific Health and Safety Programs:</p> <ul style="list-style-type: none"> <li>• Hazard Communication</li> <li>• Hearing Conservation</li> <li>• Excavation safety</li> </ul> <p><b>AHA Assessment</b> - During the initial walk through the FOL and/or the SSHO shall review the AHA to determine applicability or information that will need added given site specific conditions.</p>

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA.

<b>Name (Printed)</b>	<b>Signature</b>	<b>Occupation</b>	<b>Date Reviewed/Training</b>



### ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> Decontamination	Overall Risk Assessment Code (RAC) (Use highest code)					L
<b>Project Location:</b> SWMU 17, NSA Crane	Risk Assessment Code (RAC) Matrix					
<b>Contract Number:</b> N62470-08-D-1008	<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b> April 16, 2015		<b>Frequent</b>	<b>Likely</b>	<b>Occasional</b>	<b>Seldom</b>	<b>Unlikely</b>
<b>Prepared by:</b> J. Laffey, CESCO	<b>Catastrophic</b>	E	E	H	H	M
	<b>Critical</b>	E	H	H	M	L
<b>Reviewed by:</b> J. Carothers, PhD	<b>Marginal</b>	H	M	M	L	L
	<b>Negligible</b>	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					<b>RAC Chart</b>
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					<b>E=Extremely High</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					<b>H= High</b>
						<b>M= Moderate</b>
						<b>L= Low</b>

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
Personal Decontamination	1. Slips, Trips, Falls	<ol style="list-style-type: none"> <li>Clear intended decon area location of ground hazards.</li> <li>Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards.</li> <li>Wear appropriate foot protection to prevent slips and trips.</li> <li>Use caution when working on uneven and wet surfaces.</li> </ol>	L
Equipment drop Segregated removal of PPE (wash and rinse reusable items, dispose of non-reusable items)	2. Exposure to contaminated media	<ol style="list-style-type: none"> <li>Follow good decontamination practices (work from top down and outside in).</li> <li>Nitrile gloves are to be the last item of PPE removed.</li> <li>Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.</li> </ol>	L
Decontamination of excavation equipment and large tooling (e.g., vehicles, etc.) using pressure washer	1. Noise	<ol style="list-style-type: none"> <li>Pressure washer operator must wear hearing protection (muffs or plugs with NRR of at least 25 dB).</li> <li>Restrict other personnel from decon pad during pressure washing operations.</li> </ol>	L
	2. Flying projectiles	<ol style="list-style-type: none"> <li>Pressure washer operator must exercise care when directing the wand so that it is not pointing at himself/herself or at any other worker.</li> <li>Pressure washer operator must wear full face shield over safety glasses with side shields and brow protection.</li> <li>At SSHO discretion, additional PPE consisting of hardhat, rainsuit, apron, and or boot covers may be required during decon operations - depending on</li> </ol>	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		observations indicating that significant contact with decon overspray and/or windy conditions during washing activities.	
	3. Foot injuries	1. Place items to be decontaminated on ground or on washing/drying racks in a manner that they are secure and will not fall. 2. Wear safety toe safety footwear.	L
	4. Strains/sprains from heavy lifting	1. Practice safe lifting techniques 2. Use mechanical lifting devices such as a dolly whenever possible 3. Ensure clear path of travel 4. Have a good grasp on object 5. Perform "test lift" to gauge ability to safely make the lift 6. Lift with legs not back 7. Obtain help when needed to lift large, bulky, or heavy items.	L
	5. Slips/trips/falls	1. Keep decon areas orderly 2. Maintain good housekeeping 3. Spread light coating of sand on decon pad liner to increase traction.	L
	6. Exposure to contaminated media	1. Follow good decontamination practices (work from top down and outside in). Surgeon's gloves are to be the last item of PPE removed. 2. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.	L

EQUIPMENT	INSPECTION	TRAINING
Hand tools (hand brushes, water sprayers, etc.)	Visual inspection prior to use by user. Check wooden handles for cracks or splinters	None required.
Personal Protective Equipment: <b>Minimum:</b> Nitrile gloves, safety toe boots, safety glasses <b>Optional items:</b> Hardhat, hearing protection. <b>HTRW:</b> PCBs	Initial PPE inspection performed by FOL/SSHO. Ongoing (prior to each use) inspections responsibilities of PPE users.	Initial site specific H&S training to cover review of the APP. Daily tail-gate and pre-task briefings to review appropriate AHAs and other relevant topics. OSHA 40 hour HAZWOPER training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. Also Review of AHA during tailgate safety briefing with the intended task participants.

EQUIPMENT	INSPECTION	TRAINING
		PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the FOL/SSHO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date

		<b>ACTIVITY HAZARD ANALYSIS</b>					
<b>Activity/Work Task:</b> Investigative Derived Waste (IDW) Management		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>			L		
<b>Project Location:</b> SWMU 17, NSA Crane		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> N62470-08-D-1008							
<b>Date Prepared:</b> April 16, 2015							
		<b>Severity</b>	<b>Probability</b>				
			<b>Frequent</b>	<b>Likely</b>	<b>Occasional</b>	<b>Seldom</b>	<b>Unlikely</b>
<b>Prepared by:</b> J. Laffey, CESCO		<b>Catastrophic</b>	E	E	H	H	M
		<b>Critical</b>	E	H	H	M	L
<b>Reviewed by:</b> J. Carothers, PhD		<b>Marginal</b>	H	M	M	L	L
		<b>Negligible</b>	M	L	L	L	L
<b>Notes: (Field Notes, Review Comments, etc.)</b>		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
		"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.				<b>RAC Chart</b>	
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				<b>E= Extremely High</b>	
						<b>H= High</b>	
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				<b>M= Moderate</b>	
						<b>L= Low</b>	

JOB STEPS	HAZARDS	CONTROLS	RAC
Filling, moving 55-gallon drums of IDW	1. Heavy lifting	1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, 2. Ensure clear path of travel 3. Have a good grasp on object 4. Perform "test lift" to gauge ability to safely make the lift 5. Lift with legs not back 6. Obtain help when needed to lift large, bulky, or heavy items.	L
	2. Struck by/pinches compressions	1. Exercise caution when handling drums. 2. Position drums so that there is adequate room between them for placement and repositioning.	L
	3. Falling objects (drums)	1. Do not stack drums on top of each other. 2. Do not place more than 4 drums to a pallet. 3. Leave at least 4 feet of clearance between pallets for clear access.	L
	4. Slips, Trips, Falls	1. Maintain good housekeeping in IDW storage areas, keeping it clear of loose debris and other potential tripping hazards. 2. Wear appropriate foot protection to prevent slips and trips. 3. Use caution when working on uneven and wet ground surfaces.	L

JOB STEPS	HAZARDS	CONTROLS		RAC
	5. Foot hazards	1. Safety toe foot protection will be required for IDW container handling activities.		L
	6. Minor contusions, abrasions, cuts	1. Wear cut-resistant gloves when handling items with sharp or rough edges.		L
EQUIPMENT		INSPECTION	TRAINING	
Hand tools (drum dollies, wrenches, etc.)		Visual inspection prior to use by user. Check wooden handles for cracks or splinters.	All personnel participating in this activity must be current with HAZWOPER training requirements.	
<b>Personal Protective Equipment:</b> <b>Minimum:</b> Safety toe boots, safety glasses <b>Optional items:</b> Hardhat, cotton or leather work gloves. If contact with IDW is likely, wear chemical-resistant coveralls (e.g., surgeon's nitrile gloves under leather/cotton work gloves <b>HTRW:</b> PCBs		Initial PPE inspection performed by FOL/SSHO. Ongoing (prior to each use) inspections responsibilities of PPE users.	Initial site specific H&S training to cover review of the APP. Daily tail-gate and pre-task briefings to review appropriate AHAs and other relevant topics.  PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the FOL/SSHO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.	

I have read and understand this AHA:

Name (Printed)	Signature	Date

		<b>ACTIVITY HAZARD ANALYSIS</b>					
<b>Activity/Work Task:</b> Surveying via Global Positioning System (GPS) , and Vegetation Management		<b>Overall Risk Assessment Code (RAC)</b> (Use highest code)			L		
<b>Project Location:</b> SWMU 17, NSA Crane		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Contract Number:</b> N62470-08-D-1008		<b>Severity</b>	<b>Probability</b>				
<b>Date Prepared:</b> April 16, 2015			Frequent	Likely	Occasional	Seldom	Unlikely
<b>Prepared by:</b> J. Laffey, CESCO		Catastrophic	E	E	H	H	M
<b>Reviewed by:</b> J. Carothers, PhD		Critical	E	H	H	M	L
Notes: (Field Notes, Review Comments, etc.)		Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L
		Step 1: Review each <b>"Hazard"</b> with identified safety <b>"Controls"</b> and determine RAC (See above)					
		<b>"Probability"</b> is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.			<b>RAC Chart</b>		
		<b>"Severity"</b> is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible			<b>E= Extremely High Risk</b>		
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each <b>"Hazard"</b> on AHA. Annotate the overall highest RAC at the top of AHA.			<b>H= High Risk</b>		
					<b>M= Moderate Risk</b>		
					<b>L= Low Risk</b>		

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
Geographical Surveying	Flying projectiles/Struck by	1. When hammering wooden hubs into the ground there is a possibility that shards may break off. To protect from potential eye injury during this activity personnel will wear safety glasses. 2. Crack or damage hubs will not be used. 3. Use a suitable hammer to drive the hubs. The hammer shouldn't be so heavy that and additional person must hold the hub while you drive it into the ground. 4. Inspect the hammer to ensure the head is attached tightly and there are no indication of mushrooming head that could also become a flying projectile should it break off. 5. Use a hub cover to eliminate this hazard while also removing hands and fingers from the potential strike area	L
	Slips, trips, and falls:	1. Remove/identify trip hazards from the work area so they may be avoided. 2. Maintain good housekeeping within the work area. 3. Place the hubs in a bucket or similar device. That way should you fall you are less likely to impale yourself.	L
	Poisonous plants	1. There are areas that are not well maintained (Grass is cut, etc.) and therefore poisonous plants and insects may be encountered.	L

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		2. Watch for Poison Ivy, Poison Oak, and Poison Sumac and avoid if at all possible. 3. If not wear protective clothing that maybe thrown away when the task is complete. 4. Wear barrier creams or PPE, prior to entry into heavy brush. 5. Wash with cool water and soap or an over the counter solutions to remove these oils from the skin. 6. Wash your contaminated clothes separate from your other clothes.	
	Insect bites and stings	1. Use repellants applied liberally to skin and clothing per the manufacturers requirements. 2. Wear light colored clothing – This will assist in controlling heat stress as well as seeing crawling insects on your body easier to detect. 3. Tape pant legs to boots to control insect (Ticks) access into clothing. 4. Snake chaps should be worn in heavy vegetation or areas of reported stings.	L
Vegetation Removal	Cuts/lacerations; Struck by:	1. Wear hard hat, safety glasses, and leather gloves when cutting and removing vegetation. 2. Keep cutting tools within their sheath during periods of travel or non-use. 3. Keep a 15-foot boundary during vegetation removal (by hand). 4. If hand tools (brush hooks, machetes, etc.) are used to clear brush and small trees the following precautions should be followed: 5. Inspect handles are they in good condition (no cracks, splinters, loose heads/cutting apparatus). 6. Check cutting tools edges all blades should be sharp without knicks or gouges in the blade. 7. All hand tools (brush hooks, machetes, etc.) should be kept in a sheath when not in use. 8. A 10-foot perimeter will be established around areas where brush clearing is being conducted.	L

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Machetes; brush axes; sledge hammers; Survey equipment.	Inspect handles; heads; cutting implements	General operating/demonstrated skill of the survey personnel.
<b>Personal Protective Equipment:</b> <b>Minimum:</b>	Inspect PPE to ensure it is in adequate condition	All personnel: <ul style="list-style-type: none"> <li>Site Specific Training – All personnel shall be instructed and attest to the review and understanding of this SSHP prior to the commencement of on-site activity.</li> </ul>

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Safety Glasses; footwear with adequate Lug and ankle support; leather/canvas work gloves.</p> <p><b>Optional items:</b>                      High visibility vests are recommended for these activities in high traffic areas.</p> <p><b>Emergency Equipment</b></p> <ul style="list-style-type: none"> <li>- First Aid Kit</li> <li>- Fire Extinguisher</li> <li>- Map to Hospital</li> <li>- Emergency Contact List</li> </ul>		<ul style="list-style-type: none"> <li>• Periodically, Tailgate Training Sessions will be conducted to review activities in progress, results of site surveys, and upcoming tasks. It is recommended that AHAs be reviewed prior to conducting the identified task.</li> <li>• Complete a Medical Data Sheet</li> </ul> <p>Survey License and/or Certification Proof</p> <p><b>Decontamination Procedures:</b>                      Not required. Good personal hygiene practices are to be employed prior to breaks lunch or other period when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p><b>Inclement Weather</b> – Use the 30/30 Rule – If there is 30 seconds or less between thunder and lightning go inside for 30 minutes or more since the last thunder.</p>

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA.

Name (Printed)	Signature	Occupation	Date Reviewed/Training



## Activity Hazard Analysis

<b>Activity/Work Task:</b> Vault/Pipeline CCTV Survey and Smoke Test	Overall Risk Assessment Code (RAC) (Use highest code)	<b>L</b>
<b>Project Location:</b> SWMU 17, NSA Crane	<b>Risk Assessment Code (RAC) Matrix</b>	
<b>Contract Number:</b> N62470-08-D-1008	<b>Probability</b>	
<b>Date Prepared:</b> April 16, 2015	<b>Severity</b>	Frequent    Likely    Occasional    Seldom    Unlikely
<b>Prepared by:</b> J. Laffey, CESCO	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>
<b>Reviewed by:</b> J. Carothers, PhD	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>
<b>Notes: (Field Notes, Review Comments, etc.)</b>	Step 1: Review each <b>"Hazard"</b> with identified safety <b>"Controls"</b> and determine RAC (See above)	
	<b>"Probability"</b> is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.	<b>RAC Chart</b>
	<b>"Severity"</b> is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	<b>E= Extremely High Risk</b>
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each <b>"Hazard"</b> on AHA. Annotate the overall highest RAC at the top of AHA.	<b>H= High Risk</b>
		<b>M= Moderate Risk</b>
		<b>L= Low Risk</b>

JOB STEPS	HAZARDS	CONTROLS	RAC
Mobilization	1. Slips, trips and falls	1. Remove/identify trip hazards from the work area so they may be avoided. 2. Find a level area to stage equipment. 3. Practice good housekeeping and keep the area free of clutter. 4. Always be on the alert for moving equipment while working near roadway. 5. Wear high visibility clothing if near a roadway.	<b>L</b>
	2. Wildlife	1. Check the area and the pipe for signs of wildlife and note any wild or suspicious acting animals in your work area. 2. Avoid direct contact with bird, bat or other animal droppings. 3. Never touch or handle wild animals – healthy, sick, or deceased, as parasites and other infectious diseases may be present.	<b>L</b>
	3. Insects bites and stings	1. Use repellants applied liberally to skin and clothing per the manufacturers requirements. 2. Wear light colored clothing – This will assist in controlling heat stress as well as seeing crawling insects on your body easier to detect. 3. Tape pant legs to boots to control insect (Ticks) access into clothing. 4. Snake chaps should be worn in heavy vegetation or areas of reported stings.	<b>L</b>

JOB STEPS	HAZARDS	CONTROLS	RAC
Remote operated vehicle (ROV) mounted with a camera system	1. Lifting and lowering (muscle strains and pulls)	1. Practice safe lifting techniques. 2. Use mechanical lifting devices such as a dolly whenever possible 3. Ensure clear path of travel. 4. Have a good grasp on object. 5. Perform "test lift" to gauge ability to safely make the lift. 6. Lift with legs not back. 7. Obtain help when needed to lift large, bulky, or heavy items.	L
	2. Electrical shock	1. Follow manufacturer's instructions when initialize equipment. 2. Make sure cables are securely fastened. 3. Have an appropriate contingency plan in the event of equipment failure. 4. Utility clearance will be completed for the area in which the video inspection is being conducted to detect potential cross boring from other utility services.	L
Confined space entry	1. Suffocation, asphyxiation, entrapment	1. <b>DO NOT ENTER</b> the sewer pipe or a manhole without implementing a Confined Space Entry Program. 2. Notify the PHSO immediately.	L
Smoke Test	1. Obscured vision, burns.	1. The field crew will be of sufficient size to properly operate the smoke generation machine and provide full coverage of the area to visually locate smoke discharged from defects. This must include personnel for traffic control. 2. Personnel performing the smoke testing shall be properly trained and thoroughly experienced in the use of the equipment and procedures 3. If smoke blower is used ensure that proper size for the pipe and follow manufactures instructions for care and operation. 4. Smoke fluid, smoke candles shall produce continuous smoke that can be controlled by the testing crew for the duration of the test. 5. The smoke generated shall be white to gray in color, leave no residue, and shall be non-toxic and non-explosive. 6. The sub-contractor shall supply the smoke SDS sheet to the FOL/SSHO.	L

EQUIPMENT	INSPECTION	TRAINING
Remote control video equipment. Blower, smoke fluid or smoke candles.	Visual inspection prior to use by user.	Training/experience in proper sample collection, handling and chain of custody requirements. Read manufacturer's instructions for video equipment and smoke generating products.

EQUIPMENT	INSPECTION	TRAINING
<p><b>Personal Protective Equipment:</b>  <b>Minimum:</b> leather work gloves, safety toe boots, safety glasses.  <b>Optional:</b> Tyvek if chance of soiling clothing, high visibility vest if in traffic area.</p>	<p>Initial PPE inspection performed by SSHO. Ongoing (prior to each use) inspections responsibilities of PPE users.</p>	<p>OSHA 40 hour HAZWOPER training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. ALSO: Review of AHA during pre-task tailgate safety briefing with the intended task participants.</p> <p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSHO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p>

I have read and understand this AHA:

Name (Printed)	Signature	Date

## 11.0 REFERENCES, MATERIALS AND DOCUMENTATION

United States Army Corps of Engineers. 15 September 2008. Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual.

Available online at: <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em385-1-1/entire.pdf>

The Tetra Tech FOL/SSHO shall ensure the following materials/documents are taken to the project site and used when required. The following documentation is to be posted or maintained at the site for quick reference purposes. For this project, the items so noted below will be maintained in the Tetra Tech work vehicle.

**Chemical Inventory Listing (posted)** - This list represents the chemicals brought onsite, including decontamination solutions, sample preservations, fuel, etc. This list will be maintained in the Tetra Tech Work Trailer.

**Material Safety Data Sheets/Safety Data Sheets (SDSs) (maintained)** - The SDSs will be maintained in the Tetra Tech Work trailer. These documents should match the listings on the chemical inventory list for substances used onsite. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

**Placards and Labels (maintained)** - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using DOT placards and acceptable (Hazard Communication 29 CFR 1910.1200(f)) labels.

**The OSHA Job Safety & Health Protection Poster (posted)** - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL/SSHO shall ensure that this poster is not defaced, altered, or covered by other material. See Attachment IV.

**Site Clearance (maintained)** - This list is found within the training section of the APP. This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The list indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities. This list will be maintained in a vehicle onsite during operations.

**Emergency Phone Numbers and Directions to the Hospital(s) (posted)** - This list of numbers and directions will be maintained at phone communications points and in each site vehicle.

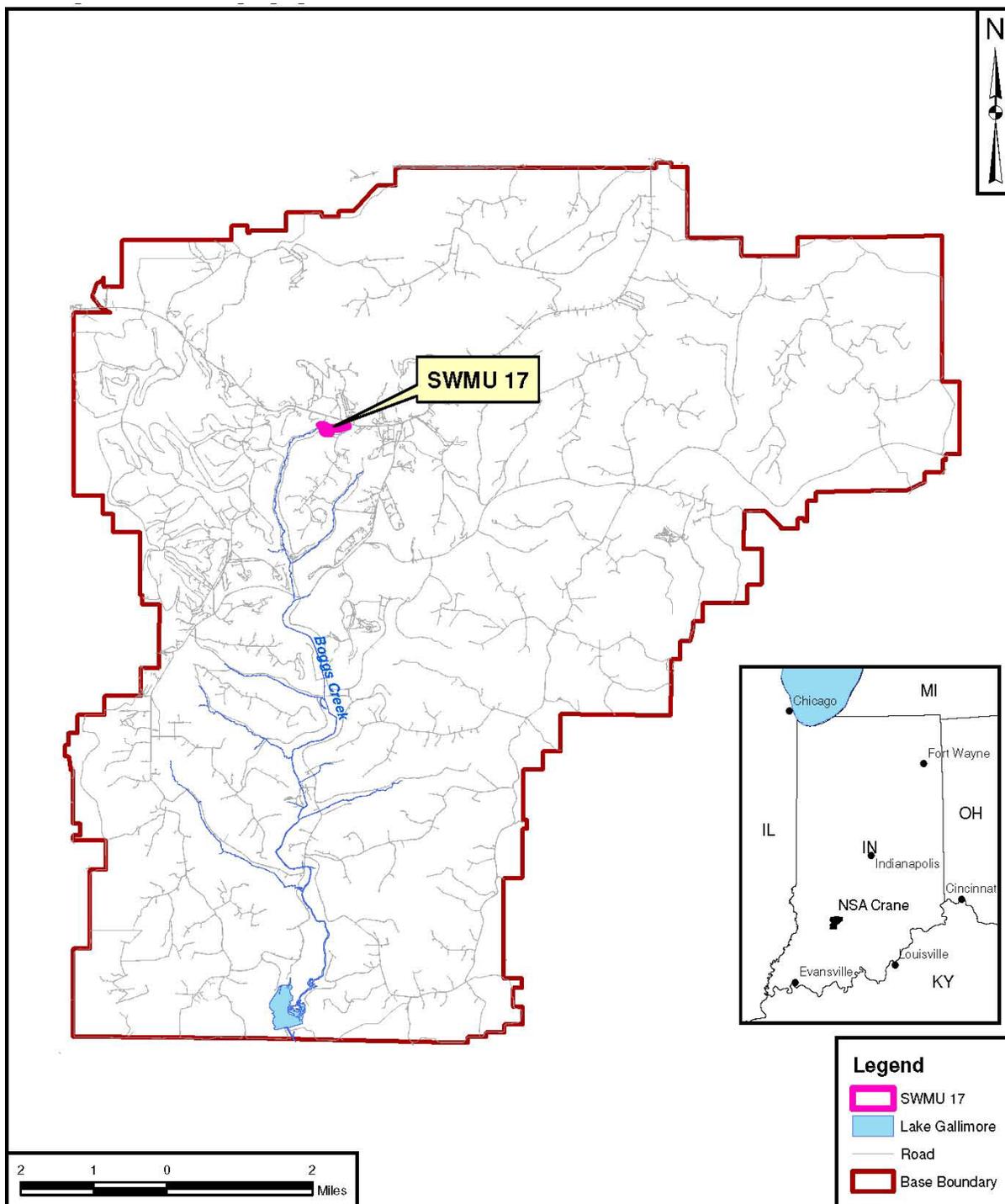
**Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be completed by onsite personnel and filed in the Tetra Tech Work Trailer. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to personnel to carry at times.

**Hearing Conservation Standard (29 CFR 1910.95) (posted)** - This standard will be posted any time hearing protection or other noise abatement procedures are used.

## FIGURES

FIGURE 2-1

FACILITY LOCATION MAP





# OSHA's Form 300A (Rev. 01/2004) Summary of Work-Related Injuries and Illnesses

Year 2013



U.S. Department of Labor  
Occupational Safety and Health Administration

Form approved OMB no. 1218-0178

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

## Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	19	13	54
(G)	(H)	(I)	(J)

## Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
617	588
(K)	(L)

## Injury and Illness Types

Total number of... (M)			
(1) Injury	77	(4) Poisoning	0
(2) Skin Disorder	5	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	4

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 55 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

## Establishment information

Your establishment name Tetra Tech, Inc. (ENTEPRISE WIDE)  
 Street 3475 East Foothill Blvd.  
 City Pasadena State California Zip 91107  
 Industry description (e.g., Manufacture of motor truck trailers)  
Environmental Consulting Services  
 Standard Industrial Classification (SIC), if known (e.g., SIC 3715)  
 \_\_\_\_\_  
 OR North American Industrial Classification (NAICS), if known (e.g., 336212)  
5 4 1 6 2 0

## Employment information

Annual average number of employees 13,120  
 Total hours worked by all employees last year 24,812,849

## Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Christina M. Wilson  
Company executive

VP, Corp H&S  
Title

626 351 4664  
Phone

27-Jan-14  
Date

# OSHA's Form 300A (Rev. 01/2004) Summary of Work-Related Injuries and Illnesses

Year 2014



U.S. Department of Labor  
Occupational Safety and Health Administration

Form approved OMB no. 1218-0178

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	14	12	34
(G)	(H)	(I)	(J)

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
505	458
(K)	(L)

### Injury and Illness Types

Total number of... (M)			
(1) Injury	58	(4) Poisoning	0
(2) Skin Disorder	1	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	1

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

### Establishment information

Your establishment name Tetra Tech, Inc. All Enterprise Report  
 Street 3475 East Foothill Blvd  
 City Pasadena State California Zip 91107

Industry description (e.g., Manufacture of motor truck trailers)  
Professional, Scientific and Technical Services

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

5 4 1

### Employment information

Annual average number of employees 12,093  
 Total hours worked by all employees last year 23,586,978

### Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Cherish M. McChesney  
 Company executive

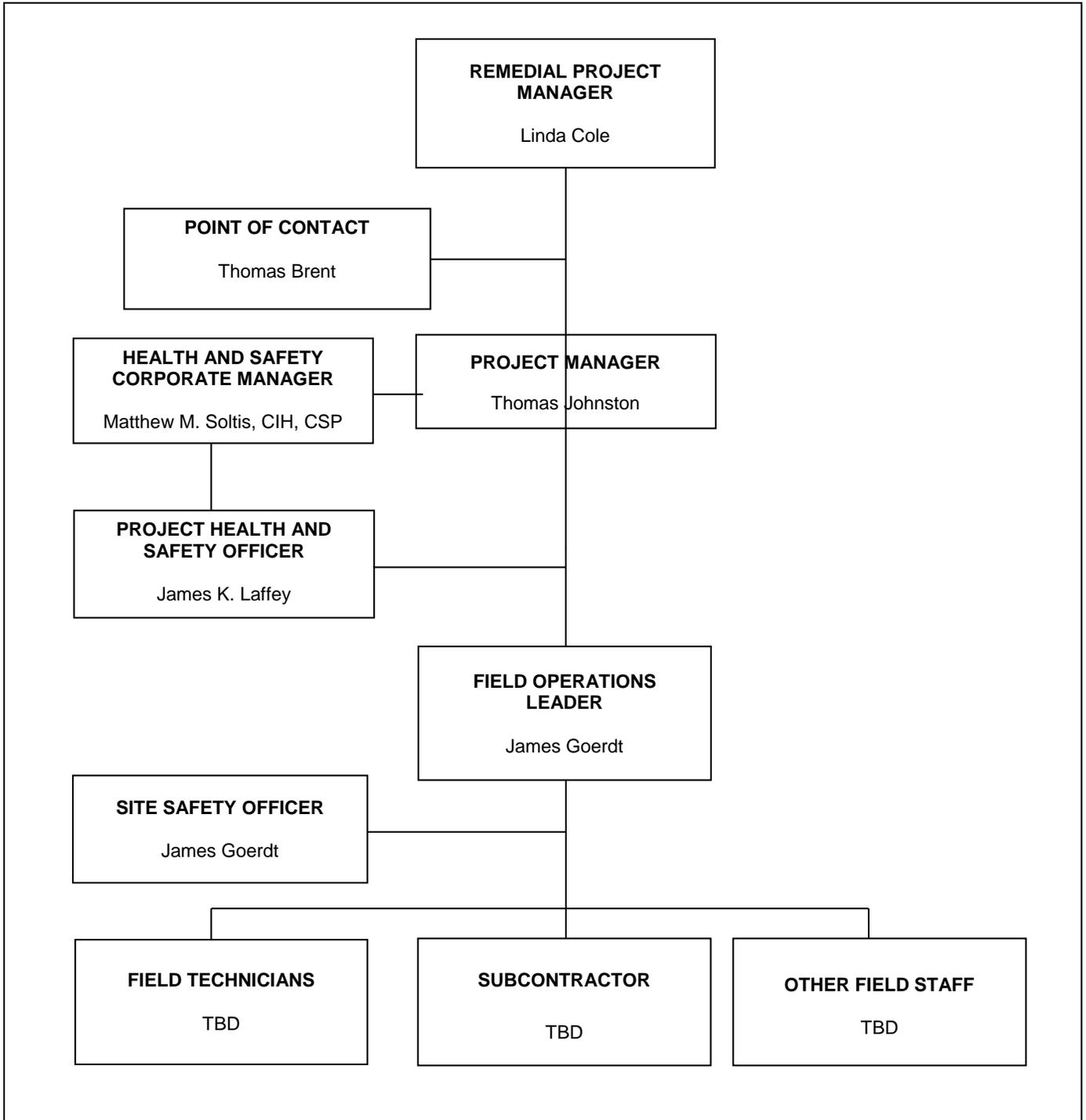
VP, Corporate HRIS  
 Title

626 470 2542  
 Phone

January 31, 2015  
 Date

FIGURE 4-1

ORGANIZATION CHART  
FIELD ACTIVITIES AT SWMU 17



**FIGURE 8-1**

**INCIDENT REPORT FORMS**

Report Date		Report Prepared By		Incident Report Number	
<b>INSTRUCTIONS:</b> All incidents (including those involving subcontractors under direct supervision of Tetra Tech personnel) must be documented on the IR Form. Complete any additional parts to this form as indicated below for the type of incident selected.					
TYPE OF INCIDENT (Check all that apply)			Additional Form(s) Required for this type of incident		
Near Miss (No losses, but could have resulted in injury, illness, or damage)			<input type="checkbox"/> Complete IR Form Only		
Injury or Illness			<input type="checkbox"/> Complete Form IR-A; Injury or Illness		
Property or Equipment Damage, Fire, Spill or Release			<input type="checkbox"/> Complete Form IR-B; Damage, Fire, Spill or Release		
Motor Vehicle			<input type="checkbox"/> Complete Form IR-C; Motor Vehicle		
<b>INFORMATION ABOUT THE INCIDENT</b>					
Description of Incident					
<hr/> <hr/> <hr/>					
Date of Incident			Time of Incident		
			_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>		
Weather conditions at the time of the incident			Was there adequate lighting?		
			Yes <input type="checkbox"/> No <input type="checkbox"/>		
Location of Incident					
_____ Was location of incident within the employer's work environment? Yes <input type="checkbox"/> No <input type="checkbox"/>					
Street Address			City, State, Zip Code and Country		
Project Name/Number			Client:		
Tt Supervisor or Project Manager			Was supervisor on the scene?		
			Yes <input type="checkbox"/> No <input type="checkbox"/>		
<b>WITNESS INFORMATION (attach additional sheets if necessary)</b>					
Name			Company		
Street Address			City, State and Zip Code		
Telephone Number(s)					

CORRECTIVE ACTIONS				
Corrective action(s) immediately taken by unit reporting the incident:				
<hr/> <hr/>				
Corrective action(s) still to be taken (by whom and when):				
<hr/> <hr/>				
ROOT CAUSE ANALYSIS LEVEL REQUIRED				
Root Cause Analysis Level Required: Level - 1 <input type="checkbox"/> Level - 2 <input type="checkbox"/> None <input type="checkbox"/>				
Root Cause Analysis Level Definitions				
Level - 1	<p><b>Definition:</b> A Level 1 RCA is conducted by an individual(s) with experience or training in root cause analysis techniques and will conduct or direct documentation reviews, site investigation, witness and affected employee interviews, and identify corrective actions. Activating a Level 1 RCA and identifying RCA team members will be at the discretion of the Corporate Administration office.</p> <p>The following events may trigger a Level 1 RCA:</p> <ul style="list-style-type: none"> <li>▪ Work related fatality</li> <li>▪ Hospitalization of one or more employee where injuries result in total or partial permanent disability</li> <li>▪ Property damage in excess of \$75,000</li> <li>▪ When requested by senior management</li> </ul>			
Level - 2	<p><b>Definition:</b> A Level 2 RCA is self performed within the operating unit by supervisory personnel with assistance of the operating unit HSR. Level 2 RCA will utilize the 5 Why RCA methodology and document the findings on the tools provided.</p> <p>The following events will require a Level 2 RCA:</p> <ul style="list-style-type: none"> <li>▪ OSHA recordable lost time incident</li> <li>▪ Near miss incident that could have triggered a Level 1 RCA</li> <li>▪ When requested by senior management</li> </ul>			
Complete the Root Cause Analysis Worksheet and Corrective Action form. Identify a corrective action(s) for each root cause identified within each area of inquiry.				
NOTIFICATIONS				
Title	Printed Name	Signature	Telephone Number	Date
Project Manager or Supervisor				
Site Safety Coordinator or Office H&S Representative				
Operating Unit H&S Representative				
Other: _____				

The signatures provided above indicate that appropriate personnel have been notified of the incident.

INSTRUCTIONS:		
Complete all sections below for incidents involving injury or illness. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.		
Incident Report Number: (From the IR Form)		
EMPLOYEE INFORMATION		
Company Affiliation		
Tetra Tech Employee? <input type="checkbox"/> TetraTech subcontractor employee (directly supervised by Tt personnel)? <input type="checkbox"/>		
Full Name	Company (if not Tt employee)	
Street Address, City, State and Zip Code	Address Type	
	Home address (for Tt employees) <input type="checkbox"/>	
	Business address (for subcontractors) <input type="checkbox"/>	
Telephone Numbers		
Work: _____	Home: _____	Cell: _____
Occupation (regular job title)	Department	
Was the individual performing regular job duties?	Time individual began work	
Yes <input type="checkbox"/> No <input type="checkbox"/>	_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>	
Safety equipment		
Provided?      Yes <input type="checkbox"/> No <input type="checkbox"/>	Type(s) provided: <input type="checkbox"/> Hard hat <input type="checkbox"/> Protective clothing	
Used?      Yes <input type="checkbox"/> No <input type="checkbox"/> If no, explain why	<input type="checkbox"/> Gloves <input type="checkbox"/> High visibility vest	
_____	<input type="checkbox"/> Eye protection <input type="checkbox"/> Fall protection	
_____	<input type="checkbox"/> Safety shoes <input type="checkbox"/> Machine guarding	
_____	<input type="checkbox"/> Respirator <input type="checkbox"/> Other (list)	
_____		
NOTIFICATIONS		
Name of Tt employee to whom the injury or illness was first reported	Was H&S notified within one hour of injury or illness?	
	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Date of report	H&S Personnel Notified	
Time of report	Time of Report	
If subcontractor injury, did subcontractor's firm perform their own incident investigation?		
Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, request a copy of their completed investigation form/report and attach it to this report.		

INJURY / ILLNESS DETAILS			
<b>What was the individual doing just before the incident occurred?</b> Describe the activity as well as the tools, equipment, or material the individual was using. Be specific. Examples: "Climbing a ladder while carrying roofing materials"; "Spraying chlorine from a hand sprayer"; "Daily computer key-entry"			
<hr/> <hr/>			
<b>What Happened?</b> Describe how the injury occurred. Examples: "When ladder slipped on wet floor and worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; Worker developed soreness in wrist over time"			
<hr/> <hr/>			
<b>Describe the object or substance that directly harmed the individual:</b> Examples: "Concrete floor"; "Chlorine"; "Radial Arm Saw". If this question does not apply to the incident, write "Not Applicable".			
<hr/> <hr/>			
MEDICAL CARE PROVIDED			
Was first aid provided at the site: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, describe the type of first aid administered and by whom?			
Was treatment provided away from the site: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, provide the information below.			
Name of physician or health care professional	Facility Name		
Street Address, City State and Zip Code	Type of Care?		
	Was individual treated in emergency room? Yes <input type="checkbox"/> No <input type="checkbox"/>		
	Was individual hospitalized overnight as an in-patient? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Telephone Number	Did the individual die? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date: _____		
	Will a worker's compensation claim be filed? Yes <input type="checkbox"/> No <input type="checkbox"/>		
NOTE: Attach any police reports or related diagrams to this report.			
SIGNATURES			
I have reviewed this report and agree that all the supplied information is accurate			
Affected individual (print)	Affected individual (signature)	Telephone Number	Date

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.

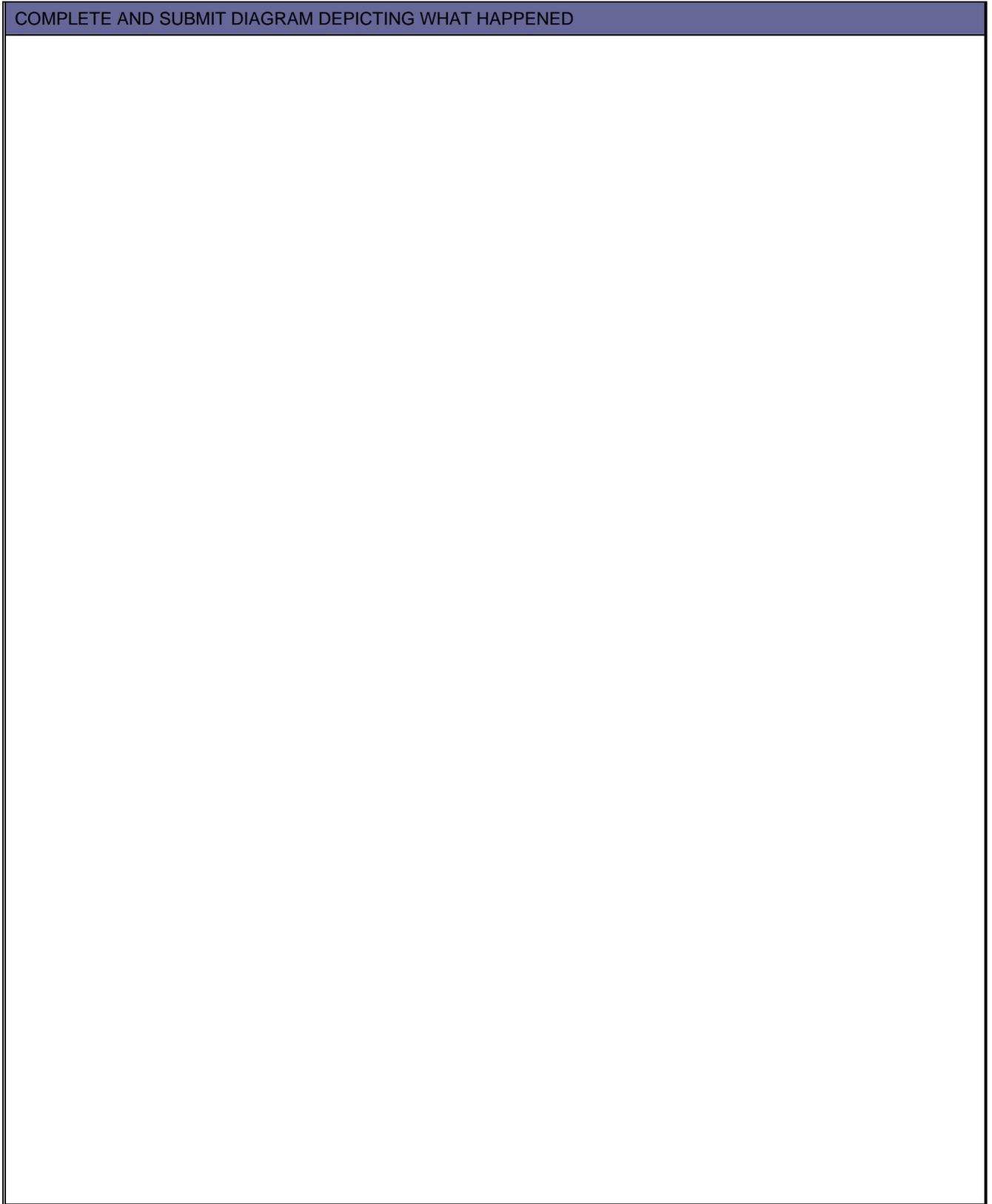
INSTRUCTIONS:			
Complete all sections below for incidents involving property/equipment damage, fire, spill or release. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.			
Incident Report Number: (From the IR Form)			
TYPE OF INCIDENT (Check all that apply)			
Property Damage <input type="checkbox"/>	Equipment Damage <input type="checkbox"/>	Fire or Explosion <input type="checkbox"/>	Spill or Release <input type="checkbox"/>
INCIDENT DETAILS			
<b>Results of Incident:</b> Fully describe damages, losses, etc.			
Response Actions Taken:			
Responding Agency(s) (i.e. police, fire department, etc.)	Agency(s) Contact Name(s)		
DAMAGED ITEMS (List all damaged items, extent of damage and estimated repair cost)			
Item:	Extent of damage:	Estimated repair cost	
SPILLS / RELEASES (Provide information for spilled/released materials)			
Substance	Estimated quantity and duration	Specify Reportable Quantity (RQ)	
		_____ Exceeded? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	
FIRES / EXPLOSIONS (Provide information related to fires/explosions)			
Firefighting equipment used? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, type of equipment: _____			
NOTIFICATIONS			
Required notifications	Name of person notified	By whom	Date / Time
Client: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Agency: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Other: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Who is responsible for reporting incident to outside agency(s)? Tt <input type="checkbox"/> Client <input type="checkbox"/> Other <input type="checkbox"/> Name: _____			
Was an additional written report on this incident generated? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, place in project file.			

INSTRUCTIONS:			
Complete all sections below for incidents involving motor vehicle accidents. Do NOT leave any blanks. Attach this form to the IR FORM completed for this incident.			
Incident Report Number: (From the IR Form)			
INCIDENT DETAILS			
Name of road, street, highway or location where accident occurred		Name of intersecting road, street or highway if applicable	
County	City	State	
Did police respond to the accident?		Did ambulance respond to the accident?	
Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Name and location of responding police department		Ambulance company name and location	
Officer's name/badge #			
Did police complete an incident report? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, police report number: _____ Request a copy of completed investigation report and attach to this form.			
VEHICLE INFORMATION			
How many vehicles were involved in the accident? _____ (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)			
Vehicle Number 1 – Tetra Tech Vehicle		Vehicle Number 2 – Other Vehicle	
Vehicle Owner / Contact Information		Vehicle Owner / Contact Information	
Color		Color	
Make		Make	
Model		Model	
Year		Year	
License Plate #		License Plate #	
Identification #		Identification #	
Describe damage to vehicle number 1		Describe damage to vehicle number 2	
Insurance Company Name and Address		Insurance Company Name and Address	
Agent Name		Agent Name	
Agent Phone No.		Agent Phone No.	
Policy Number		Policy Number	

DRIVER INFORMATION						
Vehicle Number 1 – Tetra Tech Vehicle				Vehicle Number 2 – Other Vehicle		
Driver's Name				Driver's Name		
Driver's Address				Driver's Address		
Phone Number				Phone Number		
Date of Birth				Date of Birth		
Driver's License #				Driver's License #		
Licensing State				Licensing State		
Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>		Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>
Was traffic citation issued to Tetra Tech driver? Yes <input type="checkbox"/> No <input type="checkbox"/>				Was traffic citation issued to driver of other vehicle? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Citation #				Citation #		
Citation Description				Citation Description		
PASSENGERS IN VEHICLES (NON-INJURED)						
List all non-injured passengers (excluding driver) in each vehicle. Driver information is captured in the preceding section. Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form. Injured Tt employee information is captured on FORM IR-A						
Vehicle Number 1 – Tetra Tech Vehicle				Vehicle Number 2 – Other Vehicle		
How many passengers (excluding driver) in the vehicle? _____				How many passengers (excluding driver) in the vehicle? _____		
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address		
INJURIES TO NON-TETRA TECH EMPLOYEES						
Name of injured person 1				Address of injured person 1		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>
Name of injured person 2				Address of injured person 2		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>

OTHER PROPERTY DAMAGE	
Describe damage to property other than motor vehicles	
Property Owner's Name	Property Owner's Address

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED



**FIGURE 9-1**

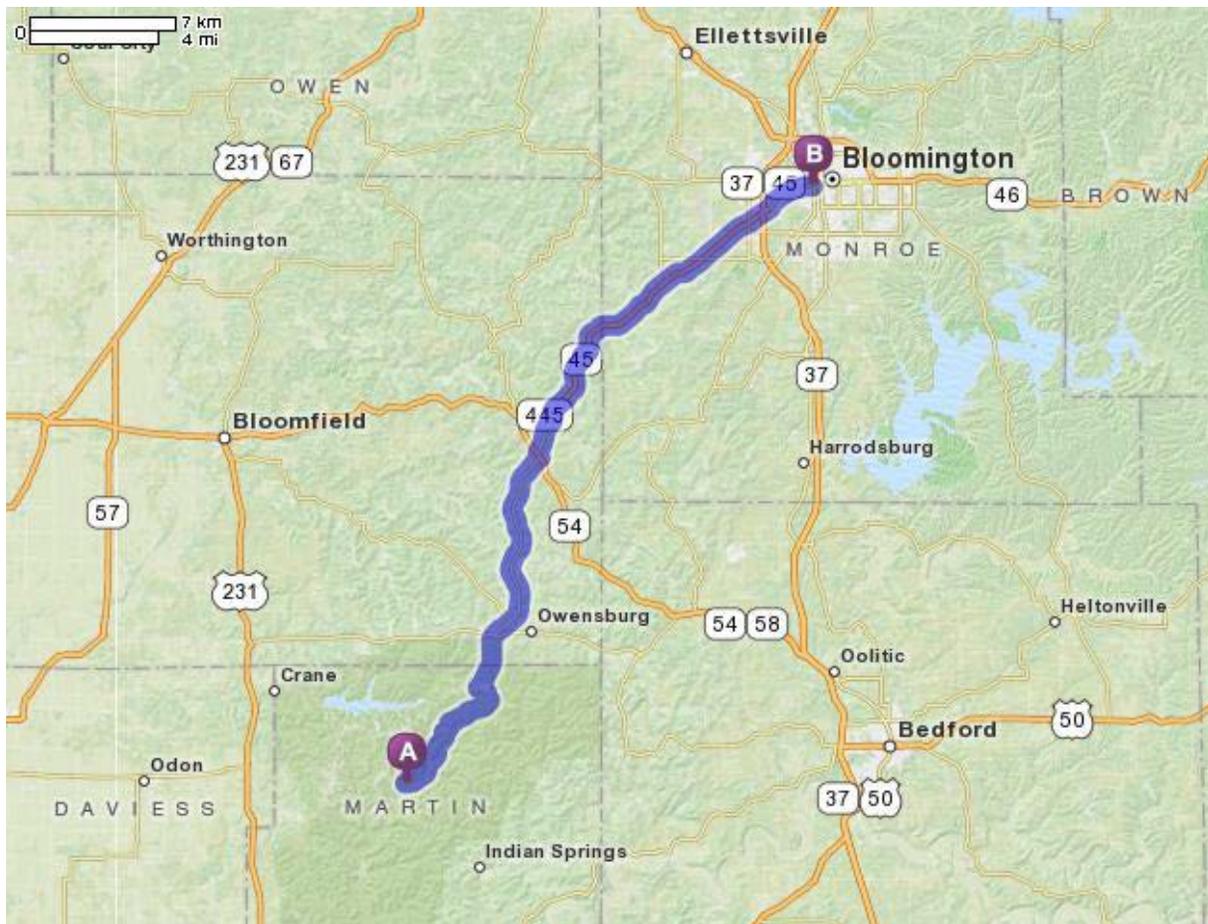
**ROUTE TO HOSPITALS**

Bloomington Hospital 601 W. 2nd ST. Bloomington, Indiana 47402  
30.63 miles - about 54 minutes

5. Exit NSA Crane on H-45 through the Bloomington Gate.
6. Follow Highway 45 North to Bloomington at Highway 45 and Highway 37.
7. Continue going straight over the overpass (Bloomfield Rd).
8. Follow Bloomfield Road North; this road turns into 2nd St
9. Follow 2nd Street, hospital will be on the right

**BLOOMINGTON HOSPITAL ROUTE MAP VIA BLOOMINGTON GATE**

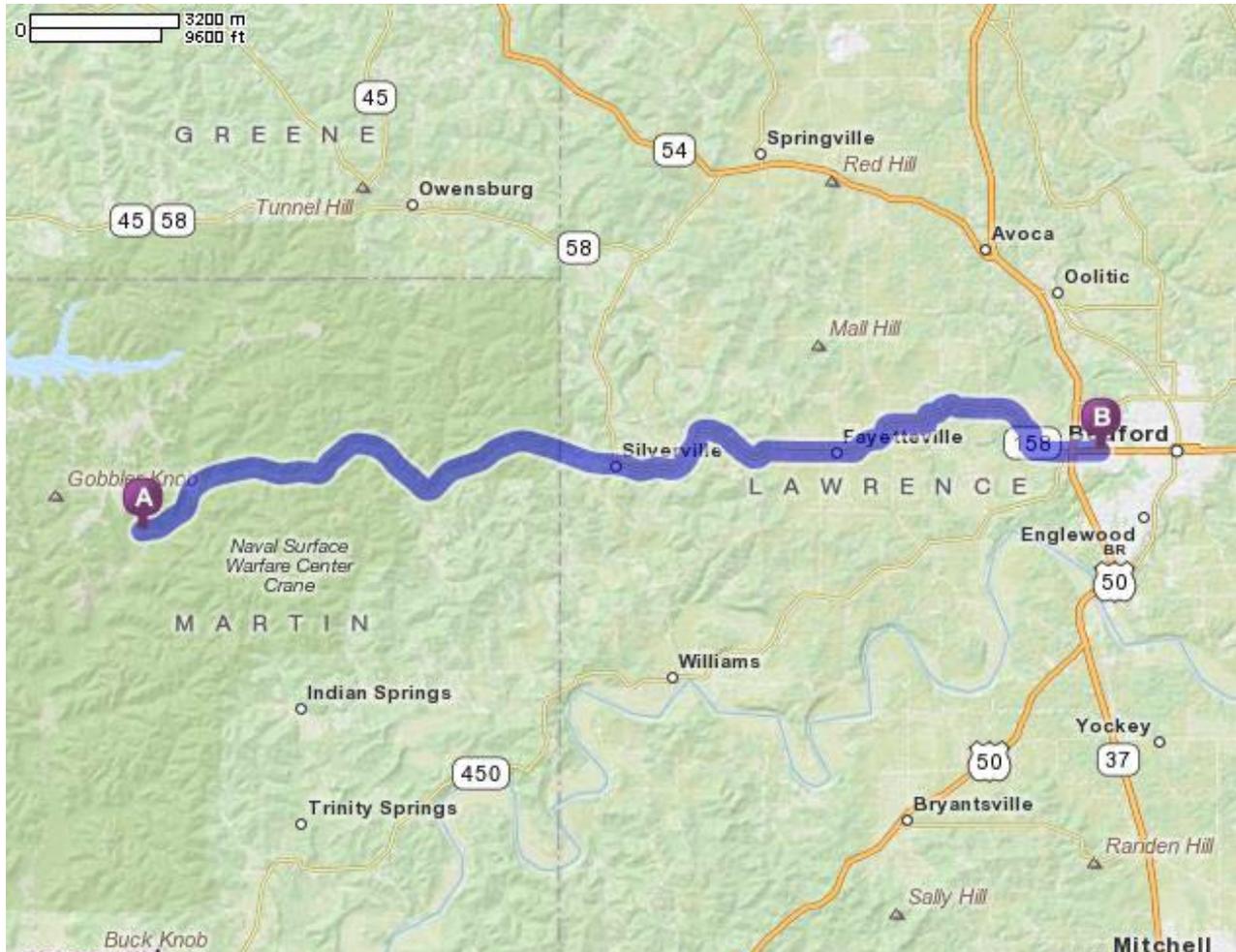
**Bloomington Gate is open 24 hours.**



Bedford Medical Center 2900 16th Street Bedford, Indiana 47421  
19.2 miles - about 40 minutes

- Exit the base on H-58, through the Bedford Gate.
- Head East on State Highway 158.
- State Highway 158 becomes 16th Street upon entering the City of Bedford.
- The medical center is on the right shortly after Plaza Drive.

**MAP TO BEDFORD MEDICAL CENTER ROUTE MAP via Bedford gate**  
**Bedford Gate is open from 0600 - 0830 and 1500 - 1800 hours**



**FIGURE 9-2**

**MEDICAL DATA SHEET**

This Medical Data Sheet must be completed by on-site personnel and kept in a secured location or on your person during site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project: \_\_\_\_\_

Name: \_\_\_\_\_ Home Telephone \_\_\_\_\_

Address: \_\_\_\_\_

Age: \_\_\_\_\_ Height: \_\_\_\_\_ Weight: \_\_\_\_\_

Person to notify in the event of an emergency: Name \_\_\_\_\_

(Relationship): \_\_\_\_\_ Phone: \_\_\_\_\_

Drug or other Allergies: \_\_\_\_\_

Doctor Prescribed Antidotes: \_\_\_\_\_ Prescription Expiration date: \_\_\_\_\_

Particular Sensitivities (Previous Medical Conditions): \_\_\_\_\_

\_\_\_\_\_

Do You Wear Contact Lenses? \_\_\_\_\_

What medications are you presently using? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name, Address, and Phone Number of your personal physician: \_\_\_\_\_

\_\_\_\_\_

Note: Health Insurance Portability and Accountability Act (HIPAA) Requirements

HIPAA took effect in 1996 then was amended in June 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires Tetra Tech to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form may not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that they can access this form so it may accompany an injured party to the hospital.

DO NOT include information that you do not wish others to know, only information that may be pertinent in an emergency situation or treatment.

\_\_\_\_\_  
Name (Print clearly)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



FIGURE 9-4

REQUIREMENTS FOR BASIC UNIT FIRST AID PACKAGES

Unit first aid item	Minimum Size or Volume (metric)	Minimum Size or Volume (US)	Item quantity per unit package	Unit package size
*Absorbent Compress	206 cm <sup>2</sup>	32 in <sup>2</sup>	1	1
* Adhesive Bandage	2.5 x 7.5 cm	1 x 3 in.	16	1
Antibiotic Treatment	0.9 g	1/32 oz.	6	1
* Adhesive Tape	457.2 cm	5 yd. (total)	1 or 2	1 or 2
* Antiseptic Swab.	0.5 g	0.14 fl. Oz.	10	1
Antiseptic Wipe	2.5 x 2.5 cm	1 x 1 in.	10	1
Antiseptic Towelette	157 cm <sup>2</sup>	24 in.	10	1
Aspirin, Individually Wrapped	325 mg		2	2
Bandage Compress (2 in.).	5 x 91 cm	2 x 36 in.	4	1
Bandage Compress (3 in.).	7.5 x 152 cm	3 x 60 in.	2	1
Bandage Compress (4 in.).	10 x 183 cm	4 x 72 in.	1	1
Burn Dressing	10 x 10 cm	4 x 4 in.	1	1-2
* Burn Treatment	0.9	1/32 fl. oz.	6	1
CPR Barrier			1	1
Cold Pack	10 x 12.5 cm	4 x 5 in	1	1-2
Eye Covering, with means of attachment	19 cm <sup>2</sup>	2.9 in <sup>2</sup>	2	1
Eye Wash	30 ml	1 fl. Oz. total	1	2
Eye Wash & Covering, with means of attachment	30 ml total 19 cm <sup>2</sup>	1 fl. oz. total 2.9 in <sup>2</sup>	1 2	2
Gloves, latex free	XL	XL	1 pair	1
Gloves, latex free	L	L	1 pair	1
Roller Bandage (4 in.).	10 x 550 cm	4 in. x 6 yd.	1	1
Roller Bandage (2 in.) 2 1	5 x 550 cm	2 in. x 6 yd.	2	1
* Sterile pad	7.5 x 7.5 cm	3 x 3 in.	4	1
* Triangular Bandage	101 x 101 x 142 cm	40 x 40 x 56 in.	1	1

- \* Minimum mandatory contents for basic fill kit

## **ATTACHMENTS**

**ATTACHMENT I**

**SITE-SPECIFIC TRAINING DOCUMENTATION FORM  
AND  
EMPLOYEE TRAINING/QUALIFICATIONS/MEDICAL  
CLEARANCE**

**TO BE ATTACHED BY PM/FOL/SSHO**

**(40-Hour HAZWOPER Certificates; 8-Hour HAZWOPER  
Refresher Certificates; First Aid/CPR Certificates;  
employee resumes as required)**



Insert employee documents here.

## **ATTACHMENT II**

# **UTILITY LOCATING AND EXCAVATION CLEARANCE STANDARD OPERATING PROCEDURE**

## 1.0 PURPOSE

Utilities such as electric service lines, natural or propane gas lines, water and sewage lines, telecommunications, and steam lines are very often in the immediate vicinity of work locations. Contact with underground or overhead utilities can have serious consequences including employee injury/fatality, property and equipment damage, substantial financial impacts, and loss of utility service to users.

The purpose of this procedure is to provide minimum requirements and technical guidelines regarding the appropriate procedures to be followed when performing subsurface and overhead utility locating services. This procedure must be reviewed by anyone potentially involved with underground or overhead utility locating and avoidance activities.

## 1.0 SCOPE

This procedure applies to field activities where there may be potential contact with underground or overhead utilities. This procedure provides a description of the principles of operation, instrumentation, applicability, and implement ability of typical methods used to determine the presence and avoidance of contact with utility services. This procedure is intended to assist with work planning and scheduling, resource planning, field implementation, and contractor procurement. Utility locating and excavation clearance requires site-specific information prior to the initiation of any such activities on a specific project. This procedure is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the methods presented may also be required.

## 3.0 GLOSSARY

**Electromagnetic Induction (EMI) Survey** - A geophysical exploration method whereby electromagnetic fields are induced in the ground and the resultant secondary electromagnetic fields are detected as a measure of ground conductivity.

**Magnetometer** – A device used for precise and sensitive measurements of magnetic fields.

**Magnetic Survey** – A geophysical survey method that depends on detection of magnetic anomalies caused by the presence of buried ferromagnetic objects.

**Metal Detection** – A geophysical survey method that is based on electromagnetic coupling caused by underground conductive objects.

**Vertical Gradiometer** – A magnetometer equipped with two sensors that are vertically separated by a fixed distance. It is best suited to map near surface features and is less susceptible to deep geologic features.

**Ground Penetrating Radar** – Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture.

#### **4.0 RESPONSIBILITIES**

**Project Manager (PM)** - Responsible for ensuring that all field activities are conducted in accordance with this procedure.

**Field Operations Leader (FOL)** - Responsible for the onsite verification that all field activities are performed in compliance with approved SOPs or as otherwise directed by the approved project plan(s).

**Site Safety Officer (SSHO)** – Responsible to provide technical assistance and verify full compliance with this procedure. The SSHO is also responsible for reporting any deficiencies to the PM.

**Health & Safety Manager (HSM)** – Responsible for preparing, implementing, and modifying corporate health and safety policy and this procedure.

**Site Personnel** – Responsible for performing their work activities in accordance with this procedure and the APP.

#### **5.0 PROCEDURES**

This procedure addresses the requirements and technical procedures that must be performed to minimize the potential for contact with underground and overhead utility services. These procedures are addressed individually from a buried and overhead standpoint.

##### **5.1 Buried Utilities**

Buried utilities present a heightened concern because their location is not typically obvious by visual observation, and it is common that their presence and/or location is unknown or incorrectly known on client properties. This procedure must be followed prior to beginning any subsurface probing or excavation that

might potentially be in the vicinity of underground utility services. In addition, the Utility Clearance Form must be completed for every location or cluster of locations where intrusive activities will occur.

Where the positive identification and de-energizing of underground utilities cannot be obtained and confirmed using the following steps, the PM is responsible for arranging for the procurement of a qualified, experienced, utility locating subcontractor who will accomplish the utility location and demarcation duties specified herein.

- A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities.
- Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities.
- Information regarding utility locations shall be added to project maps upon completion of this exercise.
- A visual site inspection must be performed to compare the site plan information to actual field conditions.
- Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities.
- Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility locations shall be added to project maps upon completion of this exercise and returned to the PM.
- If the planned work is to be conducted on private property the FOL must identify and contact appropriate facility personnel before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.
- If the work location is on public property, the agency that performs utility clearances must be notified). State "one-call" services must be notified prior to commencing fieldwork per their requirements. Most

one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again.

- The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, “one call” systems may still be required to provide location services on military installations.
- Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code(Figure 1):

**FIGURE 1  
UTILITY MARKING COLOR CODE**

<b>COLOR</b>	<b>SERVICE</b>
<b>White</b>	excavation location
<b>Red</b>	electrical
<b>Yellow</b>	gas, oil, steam
<b>Orange</b>	telephone, communications
<b>Blue</b>	water, irrigation, slurry
<b>Green</b>	sewer, drain

- Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using safe and effective methods such as passive and intrusive surveys, or the use of non-conductive hand tools. Also, in situations where such hand tools are used, they should always be used in conjunction with suitable detection equipment, such as the items described in Section 6.0 of this procedure.
- At each location where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed using a device such as a tile probe which is made of non-conductive material such as fiberglass. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.

- Any utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage.
- Contactors shall not make any repairs or modifications to existing utility lines without prior permission of the PM.
- All repairs require that the line be locked-out/tagged-out prior to work.

**5.2 Overhead Power Lines**

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by PM or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be adequate to prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Figure 2 provides the required minimum clearances for working in proximity to overhead power lines.

**FIGURE 2  
MINIMUM CLEARANCE DISTANCE**

Nominal Voltage	Minimum Clearance
0 -50 Kv	10 feet, or one mast length; whichever is greater
50+ Kv	10 feet plus 4 inches for every 10 Kv over 50 Kv or 1.5 mast lengths; whichever is greater

**1.0 UNDERGROUND LOCATING TECHNIQUES**

A variety of supplemental utility locating approaches are available and can be applied when additional assurance is needed. The selection of the appropriate method(s) to employ is site-specific and should be tailored to the anticipated conditions, site and project constraints, and personnel capabilities.

**1.1 Geophysical Methods**

Geophysical methods include electromagnetic induction, magnetics, and ground penetrating radar.

**1.1.1 Electromagnetic Induction**

Electromagnetic Induction (EMI) line locators operate either by locating a background signal or by locating a signal introduced into the utility line using a transmitter. A utility line acts like a radio antenna, producing electrons, which can be picked up with a radiofrequency receiver. Electrical current carrying conductors have a 60Hz signal associated with them. This signal occurs in all power lines regardless of voltage. Utilities in close proximity to power lines or used as grounds may also have a 60Hz signal, which can be picked up with an EM receiver. A typical example of this type of geophysical equipment is an EM-61.

EMI locators specifically designed for utility locating use a special signal that is either indirectly induced onto a utility line by placing the transmitter above the line or directly induced using an induction clamp. The clamp induces a signal on the specific utility and is the preferred method of tracing since there is little chance of the resulting signals being interfered with. A good example of this type of equipment is the Schonstedt® MAC-51B locator. The MAC-51B performs inductively traced surveys, simple magnetic locating, and traced nonmetallic surveys.

When access can be gained inside a conduit to be traced, a flexible insulated trace wire can be used. This is very useful for non-metallic conduits but is limited by the availability of gaining access inside the pipe.

### **1.1.2 Magnetics**

Magnetic locators operate by detecting the relative amounts of buried ferrous metal. They are incapable of locating or identifying nonferrous utility lines but can be very useful for locating underground storage tanks (UST's), steel utility lines, and buried electrical lines. A typical example of this type of equipment is the Schonstedt® GA-52Cx locator. The GA-52Cx is capable of locating 4-inch steel pipe up to 8 feet deep.

Non-ferrous lines are often located by using a typical plumbing tool (snake) fed through the line. A signal is then introduced to the snake that is then traced.

### **1.1.3 Ground Penetrating Radar**

Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture. In general, an object which is harder than the surrounding soil will reflect a stronger signal. Utilities, tunnels, UST's, and footings will reflect a stronger signal than the surrounding soil. Although this surface detection method may determine the location of a utility, this method does not specifically identify utilities (i.e., water vs. gas, electrical vs. telephone); hence, verification may be necessary using other methods. This method is somewhat limited when used in areas with clay soil types or with a high water table.

## **1.2 Passive Detection Surveys**

### **6.2.1 Acoustic Surveys**

Acoustic location methods are generally most applicable to waterlines or gas lines. A highly sensitive Acoustic Receiver listens for background sounds of water flowing (at joints, leaks, etc.) or to sounds introduced into the water main using a transducer. Acoustics may also be applicable to determine the location of plastic gas lines.

#### **1.2.2 Thermal Imaging**

Thermal (i.e., infrared) imaging is a passive method for detecting the heat emitted by an object. Electronics in the infrared camera convert subtle heat differentials into a visual image on the viewfinder or a monitor. The operator does not look for an exact temperature; rather they look for heat anomalies (either elevated or suppressed temperatures) characteristic of a potential utility line.

The thermal fingerprint of underground utilities results from differences in temperature between the atmosphere and the fluid present in a pipe or the heat generated by electrical resistance. In addition, infrared scanners may be capable of detecting differences in the compaction, temperature and moisture content of underground utility trenches. High-performance thermal imagery can detect temperature differences to hundredths of a degree.

## **6.3 Intrusive Detection Surveys**

### **6.3.1 Vacuum Excavation**

Vacuum excavation is used to physically expose utility services. The process involves removing the surface material over approximately a 1' x 1' area at the site location. The air-vacuum process proceeds with the simultaneous action of compressed air-jets to loosen soil and vacuum extraction of the resulting debris. This process ensures the integrity of the utility line during the excavation process, as no hammers, blades, or heavy mechanical equipment comes into contact with the utility line, eliminating the risk of damage to utilities. The process continues until the utility is uncovered. Vacuum excavation can be used at the proposed site location to excavate below the "utility window" which is usually 8 feet.

#### **6.3.2 Hand Excavation**

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings and excavations may be cleared via the use of non-conductive hand tools. This should always be done in conjunction with the use of detection equipment. This would be required for all locations where there is a potential to impact buried utilities.

### **6.3.3 Tile Probe Surveys**

For some soil types, site conditions, and excavation requirements, non-conductive tile probes may be used. A tile probe is a “T”-handled rod of varying lengths that can be pushed into the soil to determine if any obstructions exist at that location. Tile probes constructed of fiberglass or other nonconductive material are readily-available from numerous vendors. Tile probes must be performed to the same depth requirements as previously specified. As with other types of hand excavating activities, the use of a non-conductive tile probe, should always be in conjunction with suitable utility locating detection equipment.

## **6.4 INTRUSIVE ACTIVITIES SUMMARY**

The following list summarizes the activities that must be performed prior to beginning subsurface activities:

- Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.
- Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.
  - Note:** Drawings with confirmed locations should be provided to the property owner and/or client as soon as possible to reduce potential time delays.
- Notify “One Call” service. If possible, arrange for an appointment to show the One Call representative the surface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.
- Implement supplemental utility detection techniques as necessary and appropriate to confirm utility locations or the absence thereof.
- Complete the Utility Clearance Form (Figure 3). This form should be completed for each excavation location. In situations where multiple subsurface locations exist within the close proximity of one another, one form may be used for multiple locations provided those locations are noted on the Utility Clearance Form.
- Upon completion, the Utility Clearance Form and revised/annotated utility location map becomes part of the project file.

**FIGURE 3  
UTILITY CLEARANCE FORM**

Client:		Project Name:			
Project No.:		Completed By:			
Location Name:		Work Date:			
Excavation Method/Overhead Equipment:					
1.	Underground Utilities			Circle One	
	a	Review of existing maps?	Y	N	N/A
	b	Interview local personnel?	Y	N	N/A
	c	Site visit and inspection?	Y	N	N/A
	d	Excavation areas marked in the field?	Y	N	N/A
	e	Utilities located in the field?	Y	N	N/A
	f	Located utilities marked/added to site maps?	Y	N	N/A
	g	Client contact notified?	Y	N	N/A
		Name :	Telephone:	Date:	
	h	State One-Call agency called?	Y	N	N/A
		By:	Ticket #:	Date:	
	i	Geophysical survey performed?	Y	N	N/A
		By:	Method:	Date:	
	j	Hand excavation performed (w/ concurrent use of utility detection vice)? device	Y	N	N/A
	By:	Total depth (feet):	Date:		
k	Trench/excavation probed?	Y	N	N/A	
	By:	Depth/frequency:	Date:		
2.	Overhead Utilities Present Absent				
	a	Determination of nominal voltage	Y	N	N/A
	b	Marked on site maps	Y	N	N/A
	c	Necessary to lockout/insulate/re-route	Y	N	N/A
	d	Document procedures used to lockout/insulate/re-route	Y	N	N/A
	e	Minimum acceptable clearance:	Y	N	N/A
3. Notes:					
Approval:				Date:	
Field Operations Leader Date				Date:	

C: PM/Project File  
Program File

**ATTACHMENT III**

**EQUIPMENT INSPECTION CHECKLIST**

### Heavy Equipment Inspection Checklist

Company: \_\_\_\_\_

Unit/Serial No#: \_\_\_\_\_

Inspection Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_      Time: \_\_\_\_ : \_\_\_\_

Equipment Type: \_\_\_\_\_  
(e.g, earthmoving equipment - tractors backhoes, bulldozers, etc.)

Project Name: \_\_\_\_\_

Project No#: \_\_\_\_\_

Yes	No	NA	Requirements	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Seat Belts</b> <ul style="list-style-type: none"> <li>• Are available for intended operator and passengers (where applicable)</li> <li>• Seat Belts are operational?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Roll-Over Protection (ROPS)</b> <ul style="list-style-type: none"> <li>• Roll-over protection structures (ROPS) are provided on vehicles and heavy equipment (including scrapers, tractors, loaders, bulldozers, carryalls, etc.)</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Brakes</b> <ul style="list-style-type: none"> <li>• Brake systems capable of stopping and holding fully loaded equipment</li> <li>• Parking Brake functions properly</li> <li>• Wheel Chocks available (where and as applicable)</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Access</b> <ul style="list-style-type: none"> <li>• Non-slip steps</li> <li>• Grab Handles (3-Point Grab/Step Mounting Points)</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Audible Alarms</b> <ul style="list-style-type: none"> <li>• Audible alarms –Bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.</li> <li>- Back up Alarms –Self propelled equipment with an obstructed view to the rear will be equipped with a reverse gear signal alarm distinguishable from the surrounding noise level.</li> <li>• Horn functioning properly</li> </ul>	

Yes	No	NA	Requirements	Comments
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Highway Use</p> <ul style="list-style-type: none"> <li>• Fenders for equipment that can exceed 15mph</li> <li>• Fire Extinguisher</li> <li>• Are exhaust emissions directed away from the Operator?</li> <li>• Cab <ul style="list-style-type: none"> <li>- Clean, free from debris, tools or equipment that can interfere with foot Control.</li> <li>- Free from storage of flammable material/solvents</li> </ul> </li> <li>• Mirrors,</li> <li>• Safety glass <ul style="list-style-type: none"> <li>- Equipped with defrosters</li> <li>- Windshield wipers</li> </ul> </li> <li>• Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?</li> <li>• Gauges functioning properly</li> <li>• Tires (Tread) or tracks</li> <li>• Steering (standard and emergency)</li> <li>• Are tools and material secured to prevent movement during transport?</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Fluid Levels:</p> <ul style="list-style-type: none"> <li>• Engine oil</li> <li>• Transmission fluid</li> <li>• Brake fluid</li> <li>• Cooling system fluid</li> <li>• Hoses and belts</li> <li>• Hydraulic oil</li> </ul>	
<input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Fueling</p> <ul style="list-style-type: none"> <li>• Fueling of vehicles and heavy equipment is done with the engine off.</li> <li>• No smoking is permitted at or near the fuel storage or refueling area. A sign is posted stating: NO SMOKING WITHIN 50 FEET.</li> <li>• No sources of ignition are present near the fuel storage or refueling area.</li> <li>• A dry chemical or carbon dioxide fire extinguisher (rated 6:BC or larger) is in a location accessible to the fueling area, no closer than 50-feet.</li> <li>• Safety cans available?</li> </ul>	

Yes	No	NA	Requirements	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Safety Guards –</b> <ul style="list-style-type: none"> <li>• Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) the points of operations protected from accidental contact?</li> <li>• Hot pipes and surfaces are protected from accidental contact?</li> <li>• High pressure pneumatic lines have safety cable to prevent thrashing should it become disconnected?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Attachments</b> <ul style="list-style-type: none"> <li>• Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Operator Qualifications</b> <ul style="list-style-type: none"> <li>• Does the operator have proper licensing where applicable, (e.g., CDL)?</li> <li>• Does the operator, understand the equipment's operating instructions?</li> <li>• Is the operator experienced with this equipment?</li> <li>• Is the operator 21 years of age or more?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>PPE Required</b> <ul style="list-style-type: none"> <li>• Hardhat</li> <li>• Safety glasses</li> <li>• Work gloves</li> <li>• Chemical resistant gloves _____</li> <li>• Steel toed Work Boots</li> <li>• Chemical resistant Boot Covers</li> <li>• Apron</li> <li>• Coveralls Tyvek, Saranex, cotton) _____</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Key(s)?</b> <b>Operating Manual?</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Other Hazards</b> <ul style="list-style-type: none"> <li>• Excessive Noise Levels _____ dBA</li> <li>• Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.) <ul style="list-style-type: none"> <li>- MSDSs available?</li> </ul> </li> </ul>	

Approved for Use       Yes       No       See Comments

Site Health and Safety Officer

Operator

### HAND TOOL INSPECTION CHECKLIST

HAND TOOL INSPECTION CHECKLIST				
Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all tools and equipment (both company and employee owned) used by employees at their workplace in good condition?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Any loose parts?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Missing pins and/or bolts?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are broken or fractured handles on hammers, axes and similar equipment replaced promptly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are hand tools such as chisels and punches, which develop mushroomed heads during use, reconditioned or replaced as necessary?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are worn or bent wrenches replaced regularly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate handles used on files and similar tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are employees made aware of the hazards caused by faulty or improperly used hand tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are jacks checked periodically to ensure they are in good operating condition?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tool handles wedged tightly in the head of all tools?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tools stored in dry, secure locations where they won't be tampered with?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?	
Power Tool Inspection Checklist				
Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are grinders, saws and similar equipment provided with appropriate safety guards?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are power tools used with the correct shield, guard, or attachment, recommended by the manufacturer?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are portable circular saws equipped with guards above and below the base shoe? Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are rotating or moving parts of equipment guarded to prevent physical contact?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are effective guards in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, and air compressors?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are portable fans provided with full guards or screens having openings ½ inch or less?	

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are pneumatic and hydraulic hoses on power operated tools checked regularly for deterioration or damage?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Air compressor: <ul style="list-style-type: none"> <li>Is the air compressor equipped with a Surge Check Valve?</li> <li>Pressure regulator gauge and valve?</li> <li>Pressure relief valve?</li> <li>Water trap and filter?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Chainsaws</b>				
Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the chain sharp, well oiled, and properly adjusted (Chain tension)?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Bar straight? <ul style="list-style-type: none"> <li>Are there indications of excessive wear?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the chain brake lever move freely?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does chain brake stop the chain when applied?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the chain move when idling?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the cans used to fuel the chainsaw safety cans?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the on/off switch function properly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the throttle lock function properly?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the chainsaw equipped with continuous pressure throttle control?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PPE: Is the following PPE in serviceable condition?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hardhat with mesh visor and ear muffs?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety glasses?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chainsaw chaps?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gloves with protection also on the back of the hands?	

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Equipment: Is a Fire extinguisher (3A:B:C) available for immediate use?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a First-Aid Kit immediately available for use? Does it contain the minimum content as required in the APP?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Communication – Is an acceptable means of communication available (Hand signals, radios, air horns, etc.) that will support communication over the engine noise? Type?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are MSDSs available for the fuels, fuel additives, and lubricating oils?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the operator trained in proper operation of the chainsaw?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the operator demonstrate knowledgeable operation?	

I

**ATTACHMENT IV**

**OSHA POSTER**



U.S. Department of Labor



Occupational Safety  
and Health Administration

# Job Safety and Health IT'S THE LAW!

## All workers have the right to:

- A safe workplace.
- Raise a safety or health concern with your employer or OSHA, or report a work-related injury or illness, without being retaliated against.
- Receive information and training on job hazards, including all hazardous substances in your workplace.
- Request an OSHA inspection of your workplace if you believe there are unsafe or unhealthy conditions. OSHA will keep your name confidential. You have the right to have a representative contact OSHA on your behalf.
- Participate (or have your representative participate) in an OSHA inspection and speak in private to the inspector.
- File a complaint with OSHA within 30 days (by phone, online or by mail) if you have been retaliated against for using your rights.
- See any OSHA citations issued to your employer.
- Request copies of your medical records, tests that measure hazards in the workplace, and the workplace injury and illness log.

*This poster is available free from OSHA.*

**Contact OSHA. We can help.**

## Employers must:

- Provide employees a workplace free from recognized hazards. It is illegal to retaliate against an employee for using any of their rights under the law, including raising a health and safety concern with you or with OSHA, or reporting a work-related injury or illness.
- Comply with all applicable OSHA standards.
- Report to OSHA all work-related fatalities within 8 hours, and all inpatient hospitalizations, amputations and losses of an eye within 24 hours.
- Provide required training to all workers in a language and vocabulary they can understand.
- Prominently display this poster in the workplace.
- Post OSHA citations at or near the place of the alleged violations.

FREE ASSISTANCE to identify and correct hazards is available to small and medium-sized employers, without citation or penalty, through OSHA-supported consultation programs in every state.



1-800-321-OSHA (6742) • TTY 1-877-889-5627 • [www.osha.gov](http://www.osha.gov)