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HEALTH AND SAFETY PLAN FOR SITE 16/F VAPOR INTRUSION GROUNDWATER  
INVESTIGATION NWS EARLE NJ  
6/1/2014  
TETRA TECH

**Health and Safety Plan  
for  
Site 16/F Vapor Intrusion  
Groundwater Investigation  
at  
Naval Weapons Station Earle  
  
Colts Neck, New Jersey**



**Engineering Field Activity Northeast  
Naval Facilities Engineering Command**

**Contract Number N62470-08-D-1001  
Contract Task Order WE15**

**June 2014**

HEALTH AND SAFETY PLAN  
FOR  
SITE 16/F VAPOR INTRUSION  
GROUNDWATER INVESTIGATION  
AT

NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY

COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT

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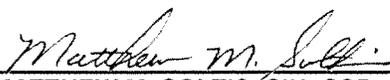
Contract Number N62470-08-D-1001  
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JUNE 2014

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## **1.0 INTRODUCTION**

The objective of this Health and Safety Plan (HASP) is to provide the safety and health requirements, practices and procedures for Tetra Tech, Inc. (Tetra Tech) personnel performing the Site 16/F Vapor Intrusion Groundwater Investigation for Site 16/F Naval Weapons Station (NWS) Earle at Colts Neck, New Jersey. For location of NWS Earle and the location of Site 16/F see Figure 1-1.

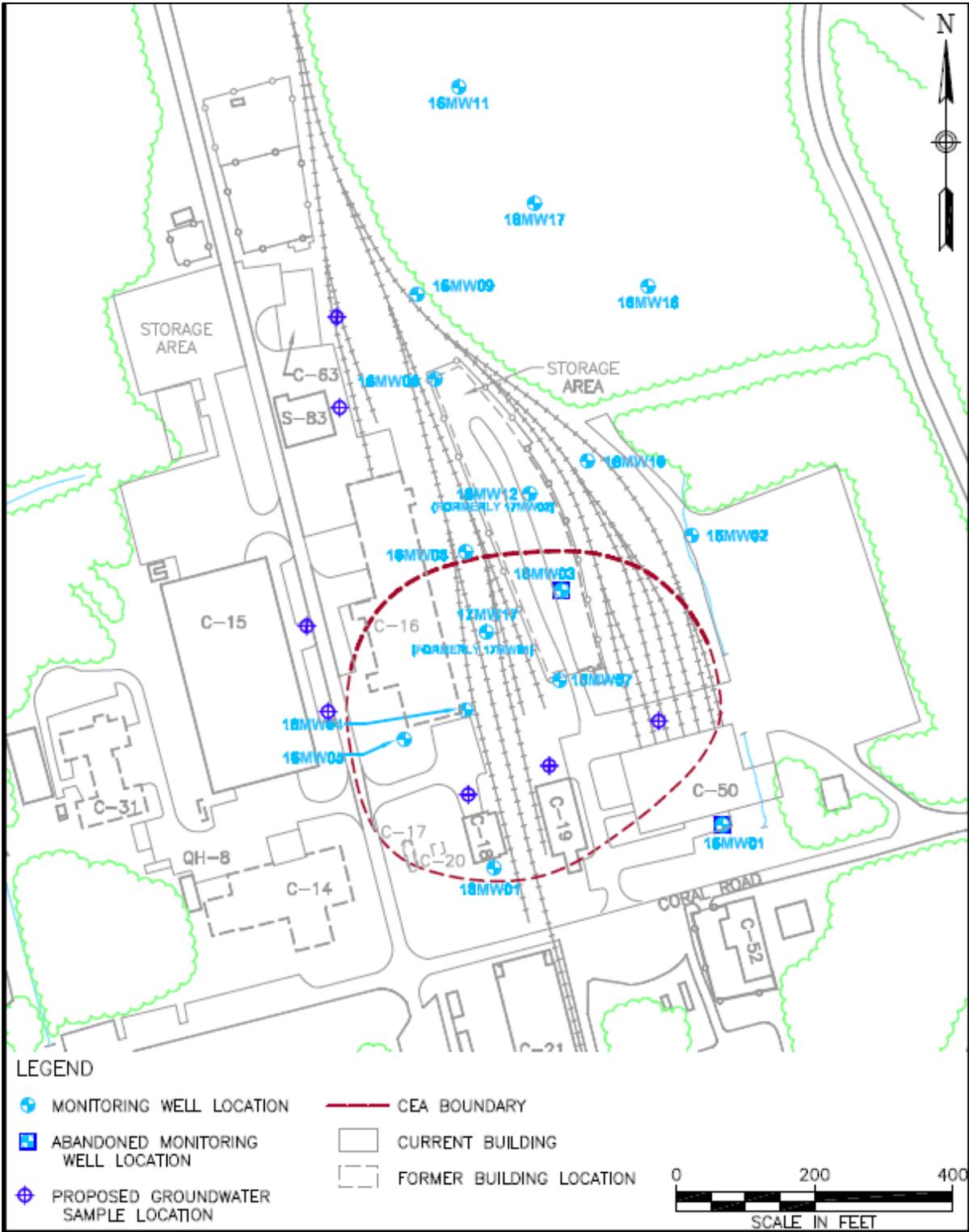
This HASP is to be used in conjunction with the Tetra Tech Health and Safety Guidance Manual (HSGM). The Guidance Manual provides detailed information pertaining to hazard recognition and control, and Tetra Tech standard operating procedures. This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard). Both documents must be present at the site to satisfy these requirements.

This HASP has been written to support proposed tasks and techniques associated with the scope of work as presented in Section 4.0. It has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work at the site. Should the proposed work site conditions and/or suspected hazards change, or if new information becomes available, this document will be modified. Changes to the HASP will be made with the approval of the Tetra Tech Project Health and Safety Officer (PHSO) and the Tetra Tech Health and Safety Manager (HSM). Requests for modifications to the HASP will be directed to the PHSO who will determine whether to make the changes. The PHSO will notify the Project Manager (PM), who will notify the affected personnel of changes.

### **1.1 AUTHORITY**

This work is authorized under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001, Contract Task Order (CTO) Number WE15.

FIGURE 1-1  
SITE 16/F LOCATION MAP



## 1.2 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibilities for site safety and health for Tetra Tech employees conducting the site investigation activities under this field effort. All personnel assigned to participate in the field work have the primary responsibility for performing all of their work tasks in a manner that is consistent with the Tetra Tech Health and Safety Policy, the health and safety training that they have received, the contents of this HASP, and in an overall manner that protects their personal safety and health and that of their co-workers. The following persons are the primary point of contact and have the primary responsibility for observing and implementing this HASP and for overall on-site health and safety.

- The Tetra Tech Project Manager (PM) is responsible for the overall direction and implementation of health and safety for this work.
  - Ensuring timely resolution of project safety questions associated with Tetra Tech operations.
  - Ensuring that Tetra Tech health and safety issues are effectively communicated to personnel.
  - Monitoring and evaluating the Tetra Tech subcontractor performance.
  
- The Project Health and Safety Officer (PHSO) is responsible for developing the HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
  - Providing information on site contaminants and physical hazards associated with the site.
  - Establishing decontamination procedures.
  - Assigning personal protective equipment.
  - 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 with hazardous waste work.
  
- The Tetra Tech Field Operations Leader (FOL) is responsible for implementation of this HASP. The FOL manages field activities, executes the Work Plan, and enforces safety procedures as applicable to the Work Plan. Specifically, the FOL will:
  - Verifying training and medical status of on-site personnel in relation to site activities.
  - Assisting and representing Tetra Tech with emergency services (if needed).
  - Providing elements site-specific training for onsite personnel.
  
- The Tetra Tech Site Safety Officer (SSO) or his/her representative supports the FOL concerning the aspects of health and safety including, but not limited to:
  - Coordinating health and safety activities.
  - Selecting, applying, inspecting, and maintaining personal protective equipment.

- Establishing work zones and control points.
- Implementing hazard communication, respiratory protection, and other associated safety and health programs.
- Coordinating with site emergency services prior to the start of onsite work.
- Verifying emergency telephone numbers prior to the start of work.
- Providing elements of site-specific training.

Compliance with the requirements stipulated in this HASP are monitored by the SSO and coordinated through the CLEAN Health and Safety Manager (HSM).

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

The competent and qualified person for this project is Mr. Donald Whalen, P.G. His resume and qualifications are listed in Section 1.4. 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/SSO has many years of field supervision in environmental sampling, and safety and meets the requirements as defined in the definitions of EM 385-1-1 and 29 CFR 1910.120 for knowledge of and experience in environmental sampling, 29 CFR 1926 for excavation, heavy equipment supervision, and OSHA construction safety.

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

Work tasks at Earle will only be performed when the designated competent person is physically on the job site. For this work the Competent Person is Mr. Donald Whalen, P.G. Mr. Whalen has 23 total years of professional experience in the environmental field. As a Geologist, he has extensive field experience in the installation of bedrock and overburden monitoring wells using air rotary drilling, mud rotary drilling, ODEX drilling, drive and wash drilling, bedrock coring, and hollow-stem augering; the collection of subsurface soil samples using split-spoon and direct-push techniques; the development and sampling of groundwater monitoring wells; the interpretation of borehole geophysical logs; and the set-up and execution of pump tests. He has extensive field experience in preremedial site characterization involving both CERCLA and RCRA. He is experienced in the planning and collection of soil, surface water, and groundwater samples, and the interpretation of sample analysis results, and the preparation of preliminary assessment and site inspection reports. Mr. Whalen has in-depth experience with the Hazard Ranking System (HRS). As a project manager, Mr. Whalen is experienced in interacting with clients and regulators, preparing and tracking budgets, procuring subcontractors, and preparing work plans and reports.

## **1.5 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 Project Manager 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.

**1.6 SITE INFORMATION AND PERSONNEL ASSIGNMENTS**

**Site Name:** Site 16/F Vapor Intrusion Groundwater Investigation

**Site Address:** NWS Earle, 201 Highway 34 South, Colts Neck, NJ 07722

**Remedial Project Manager:** Roberto Pagtalunan, P.E.      **Phone:** (757) 341-2010

**Site Contact:** Scott Fleming, P.E.      **Phone:** (732) 866-2624

**Purpose of Site Visit:** Groundwater sampling at Site 16/F Area

**Proposed Start-up Date:** April 2014 until completion

**Project Team:**

**Tetra Tech Personnel:**

Mary Mang, CHMM

Donald Whalen, PG

Matthew M. Soltis, CIH, CSP

Clyde Snyder, CESCO

**Discipline/Tasks Assigned:**

PM

FOL/SSO

CLEAN HSM

PHSO

Health Assessments (for purposes of 26 CFR 1910.132) and HASP preparation conducted by:

Clyde Snyder

## **2.0 EMERGENCY ACTION PLAN**

### **2.1 INTRODUCTION**

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. In the event of an emergency, the field team will primarily evacuate and assemble to an area unaffected by the emergency and notify the appropriate local emergency response personnel/agencies. 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. The 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 Navy RPM and NWS Earle Point of Contact (POC) will be notified if outside response agencies are contacted.

Tetra Tech site personnel may participate in minor event response and emergency prevention activities such as:

- Initial fire-fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injury/illness requiring only first-aid level support
- Provision of site control and security measures as necessary

### **2.2 EMERGENCY PLANNING**

Through the initial hazard/risk assessment effort, emergencies resulting from chemical, physical, or fire hazards are the types of emergencies which could be encountered during site activities. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following which are the responsibility of the FOL/SSO:

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:
  - Chemical Inventory (of chemicals used onsite), with Material Safety Data Sheets.
  - Onsite personnel medical records.
  - A log book identifying personnel onsite each day.
  - Hospital route maps with directions (these should also be placed in each site vehicle).
  - Emergency Notification - phone numbers.

The Tetra Tech FOL will be responsible for the following tasks:

- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.
- Periodically performing practice drills to ensure site workers are familiar with incidental response measures.
- Providing the necessary equipment to safely accomplish identified tasks.

## **2.3 EMERGENCY RECOGNITION AND PREVENTION**

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 some chemical hazards.

### **2.3.1 Recognition**

To adequately recognize chemical exposures, site personnel must have a clear knowledge of signs and symptoms of exposure associated with the principle site contaminants of concern as presented in this HASP. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in detail in Sections 4.0, 5.0 and 6.0. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The FOL/SSO will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Survey findings are documented by the FOL/SSO in the site health and safety and/or site logbook; however, site personnel will be responsible for reporting hazardous situations. Where potential hazards exist, Tetra Tech will initiate control measures to prevent adverse effects to human health and the environment.

The above actions will provide early recognition for potential emergency situations, and allow Tetra Tech to instigate necessary control measures. However, if the FOL/SSO determine that control measures are not sufficient to eliminate the hazard Tetra Tech will withdraw from the site and notify the appropriate response agencies.

### **2.3.2 Prevention**

Tetra Tech and subcontractor personnel will minimize the potential for emergencies by following the HSGM and ensuring compliance with the HASP and applicable OSHA regulations. Daily site surveys of work areas, prior to the commencement of that day's activities, by the FOL/SSO will also assist in prevention of illness/injuries when hazards are recognized early and control measures initiated.

## **2.4 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE**

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; monitoring instrumentation readings which indicate levels of contamination are greater than instituted action levels; 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 (See Figure 2-1) 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/SSO. Safe places of refuge will be identified prior to the commencement of site activities by the FOL/SSO and will be conveyed to personnel as part of the pre-activities training session. This information will be given 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/SSO or the on-site Incident Commander of the Emergency Response Team. The FOL/SSO 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/SSO will document the names of personnel onsite (on a daily basis) in the site health and safety and/or site 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) will dictate evacuation routes. The assembly points will be selected and communicated to the workers, in the daily briefing, relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site. The map showing the various assembly or Evac Points is shown in Figure 2-1 site personnel will determine which point to report to based on work being performed. The point will be relayed to site personnel each day during the daily site safety toolbox meeting. Facility maps will be posted showing the evacuation locations of the work site(s).

**FIGURE 2-1**  
**SITE EVACUATION MAP**



**2.5 EMERGENCY CONTACTS**

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to site personnel. Key emergency numbers should be programmed in each site worker's cell phone.

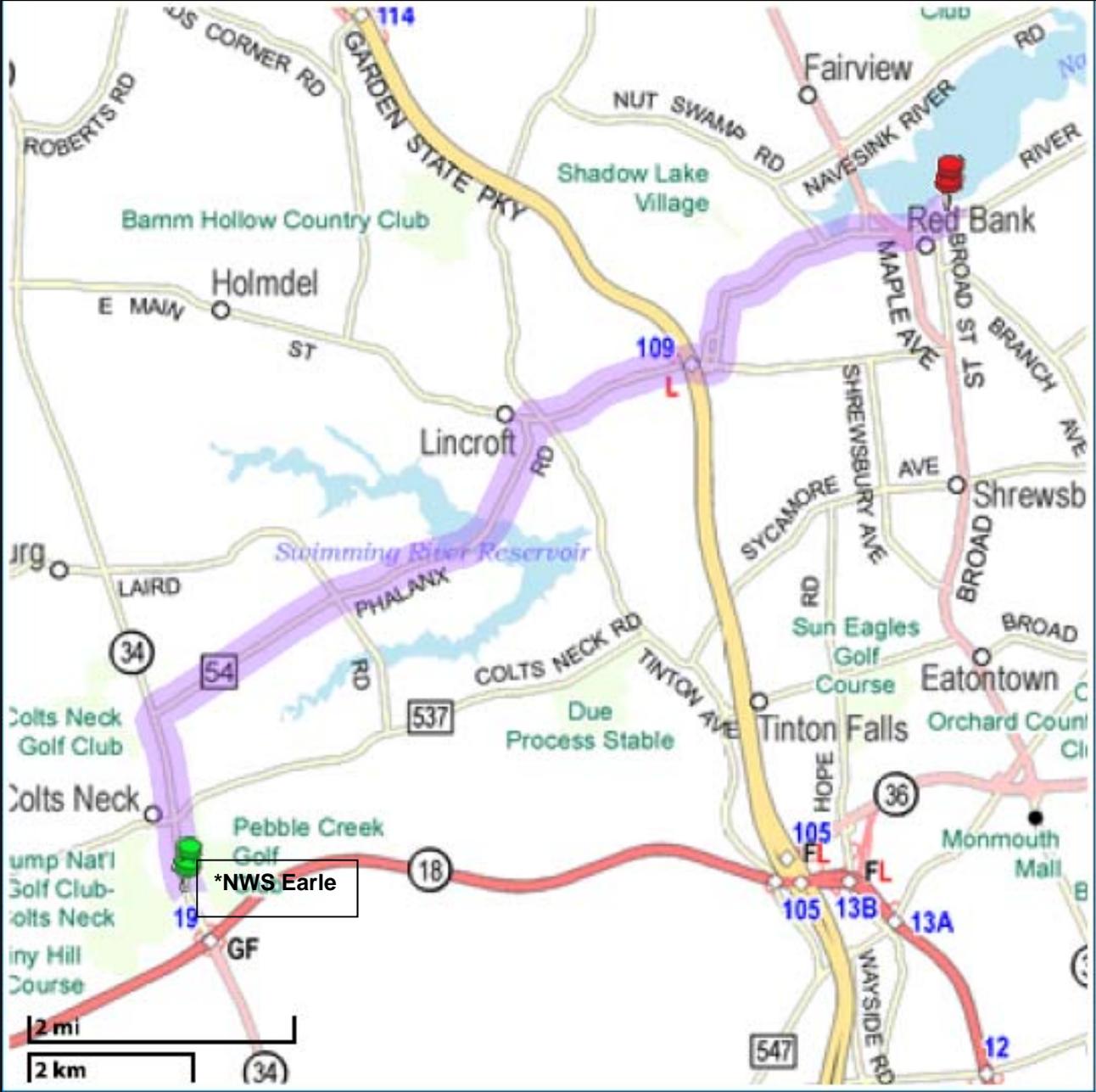
**TABLE 2-1  
EMERGENCY CONTACTS  
NWS EARLE**

CONTACT	PHONE NUMBER
<b>EMERGENCY</b>	<b>(732) 866-2911</b>
Fire/Police	(732) 866-2911
Riverview Medical Center	(732) 741-2700
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
Navy Remedial Project Manager: Roberto Pagtalunan	(757) 341-2010
Navy Site Contact: Scott Fleming	(732) 866-2624
Tetra Tech PM: Mary Mang	(610) 382-1174
Tetra Tech FOL/SSO: Donald Whalen	(610) 382-1536
Tetra Tech PHSO: Clyde Snyder	(412) 921-8904 - office (724) 516-0907 - cell
Tetra Tech CLEAN HSM: Matt Soltis	(412) 921-8912 – office (412) 260-6681 - cell
WorkCare	(888) 449-7787

2.6 EMERGENCY ROUTE TO HOSPITAL

Riverview Medical Center  
1 Riverview Plaza  
Red Bank, New Jersey 07701  
(732) 741-2700

FIGURE 2-2  
ROUTE MAP FROM MAIN SIDE NWS EARLE TO RIVERVIEW MEDICAL CENTER



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From: **Rt-34, Colts Neck 07722, New Jersey**  
To: **Riverview Medical Center(Red Bank), NJ**  
Total Distance: **9.1 miles (14.6km)**  
Total Estimated Time: **0 hrs., 20mins.**

## Directions

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### **Rt-34, Colts Neck 07722, New Jersey to Riverview Medical Center(Red Bank), NJ**

Distance: 9.1 miles (14.6km) Time: 0 hrs., 20mins.

---

1. Start out heading NORTH on RT-34 towards TRUMP NATIONAL BOULEVARD. Drive for 1.3 miles.
  2. Turn RIGHT onto PHALANX ROAD. Drive for 3.7 miles.
  3. Turn RIGHT onto NEWMAN SPRINGS ROAD. Drive for 1.3 miles.
  4. Turn SLIGHT RIGHT onto an access street towards HALF MILE ROAD. Drive for 0.1 miles.
  5. Turn SLIGHT LEFT onto HALF MILE ROAD towards HALF MILE RD.. Drive for 0.6 miles.
  6. Turn RIGHT onto W FRONT STREET. Drive for 0.9 miles.
  7. W FRONT STREET becomes CR-10. Drive for 0.8 miles.
  8. Turn LEFT onto WHARF AVENUE. Drive for a short distance.
  9. Turn RIGHT onto RIVERVIEW PLAZA. Drive for 0.1 miles.
  10. Turn LEFT onto an access street. Drive for a short distance.
  11. You have reached Riverview Medical Center(Red Bank), NJ
-

## **2.7 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES**

Tetra Tech personnel will be working in close proximity to each other at NWS Earle. As a result, hand signals, voice commands, cellular telephones, and line of site communication will be sufficient to alert site personnel of an emergency.

If an emergency warranting evacuation occurs, the following procedures are to be initiated:

- Initiate the evacuation via hand signals, voice commands, cellular phone, or line of site communication.
- Report to the designated safe place of refuge as determined by the FOL.
- Describe to the FOL/SSO (who will serve as the Incident Coordinator) pertinent incident details.

In the event that site personnel cannot mitigate the hazardous situation, the FOL/SSO will enact emergency notification procedures to secure additional assistance in the following manner:

- Dial (732) 866-2911 for spill, fire, and medical reporting and call other pertinent emergency contacts listed in Table 2-1 and report the incident.
- Give the emergency operator the:
  - Exact location of the emergency on the base
  - Type of emergency
  - Number of injured
  - 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.

## **2.8 PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY EQUIPMENT**

A first-aid kit, eye wash units (or bottles of disposable eyewash solution) and fire extinguishers (strategically placed) will be maintained onsite and shall be immediately available for use in the event of an emergency. This equipment will be located in the field office as well as in each site vehicle. Respirators will not be required on this site. If site conditions change field crew will evacuate the site and

notify the PM and PHSO for further instructions. Field personnel will require training and fit testing in order to wear respiratory protection equipment. An addendum to the HASP will also be required.

### **2.8.1 Personal Protective Equipment**

The levels of personal protection to be used for work tasks at Site 16/F 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 media. PPE is selected by the Tetra Tech PHSO when writing the site-specific HASP, 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 level of protection selected for use by field personnel during site activities is the U.S. Environmental Protection Agency (EPA) Level D. If site conditions change during field activities and 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, hazard will be reassessed.

PPE has been selected based on the results of task-specific hazard assessments (See Attachment III). 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, donning and 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/SSO is responsible for assuring that these responsibilities are fulfilled through the daily observations and work are inspections at the site. The FOL/SSO 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 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 and described, by task, in the AHAs included in Attachment III of this site-specific HASP. The PPE minimum is as follows:

- Shirts with sleeves and long pants.
- Steel toe boots.
- Safety glasses (with side shields when there is a possibility of splashing liquids).
- Hard Hat (if near overhead hazards and equipment).
- Hearing protection (when in vicinity of loud noise or operating equipment).
- High Visibility Vest (when in vicinity of operating heavy equipment or near roadways).
- Gloves: Nitrile with grip support if handling contaminated equipment or media; Nitrile –Surgeon's gloves for groundwater sampling or decon.
- Disposable Tyvek coveralls if chance of splashing or clothing saturation is present.

As noted above, detailed information is provided in the task specific AHAs provided in Attachment III.

## **2.9 DECONTAMINATION PROCEDURES / EMERGENCY MEDICAL TREATMENT**

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will be postponed if the incident warrants immediate evacuation. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

Tetra Tech personnel will perform rescue operations from emergency situations and are trained to provide initial medical support for injury/illnesses requiring "Basic First-Aid" level support. At least two people on the field crew will have first-aid training and will be on site when work is being performed to offer first-aid assistance. Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location (for example; minor cuts, bruises, stings, scrapes, and burns). The on-site first-aid/CPR responders are trained to stop or control severe bleeding, immobilize potential fractures and provide CPR in the event a person stops breathing, as with electrical shock, until the local emergency responders arrive.

Medical emergencies such as second or third degree burns, cuts, lacerations requiring stitches or butterfly bandaging, heat exhaustion, severe poisonous plant or insect bite reactions are beyond Basic First-Aid level support. Personnel providing medical assistance are required to be trained in First-Aid and in the requirements of OSHA's Bloodborne Pathogen Standard (29 CFR 1910.1030). Medical attention above First-Aid level support will require assistance from the designated emergency response agencies.

### **2.9.1 Medical Data Sheet**

Attachment I contains a blank Medical Data Sheet. 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 filed onsite. 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. If needed and once completed, the appropriate personnel on the incident report form should be notified and their signatures obtained. Once signed, this form should be stored on site and filed. 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.

As soon as possible, the NWS Earle site contact will be informed of any incident or accident that requires medical attention.

## **2.10 WORKCARE INCIDENT INTERVENTION PROGRAM**

The WorkCare Incident Intervention program is an injury and illness management tool that provides 24/7 immediate telephone access for Tetra Tech employees to access a WorkCare occupational medical provider. Their clinical staff of nurses and doctors will intervene on behalf of the Tetra Tech employee after a workplace injury and illness. The goal of the program is to help make sure the employee receives proper care with effective outcomes.

When this service is used within the first hour of an incident, known as the “golden hour,” the clinical team has the ability to guide the proper course of action so that medical evaluation and treatment are rendered appropriately. This early intervention service provides the right care, at the right time, in the proper setting.

At the time of a workplace injury or illness, the FOL/SSO calls the WorkCare toll free telephone number – (888) 449-7787. The FOL/SSO then provides information on the type of incident, possible cause, and the scope of the situation.

The WorkCare clinician will provide:

- An evaluation of the incident
- Direction on the appropriate course of action
- Consults with the employees treating physician to design a quality care treatment plan

## **2.11 INJURY/ILLNESS REPORTING**

If any Tetra Tech personnel are injured or develop an illness as a result of working on site, the Tetra Tech “Incident Report Form” (Attachment II) must be followed. Following this procedure is necessary for documenting of the information obtained at the time of the incident within 24 hours of its occurrence.

### **2.11.1 TOTAL Incident Reporting System**

TOTAL is Tetra Tech's 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.

TOTAL is maintained on the Tetra Tech Intranet site at <https://my.tetrattech.com/>

Once on the "My Tetrattech" site, TOTAL can be found under the Health and Safety tab, Incident Reporting section, select "Report an Incident (TOTAL)". This will connect you directly to TOTAL. TOTAL can also be accessed directly from the internet using the following web address: <http://totalhs.tetrattech.com/>

**Note:** When using the system 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 affected dependent upon outside factors such as connection, signal strength, etc. Enter the system using your network user name and password. The user name should be in the following format - TT\nickname.lastname.

### **2.12 AFTER ACTION CRITIQUE**

The FOL will conduct a drill/exercise prior to, or at the start of, site work to ensure familiarity of site workers with the HASPs requirements. A critique with the site personnel will be conducted after each drill or incident. This critique provides a mechanism to review the incidents and drills to determine where improvements can be made. For incidents recorded in TOTAL, the FOL will utilize the Lessons Learned component for the critique.

## **3.0 SITE BACKGROUND**

### **3.1 SITE LOCATION**

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248-acre Main Base (Mainside area), located inland, and the 706-acre Waterfront area, located on the Sandy Hook Bay. The two areas are connected by a Navy-controlled right-of-way. The facility was commissioned in 1943, and its primary mission is to supply ammunition to the naval fleet. An estimated 2,500 people either work or live at NWS Earle.

The Waterfront area is located adjacent to Sandy Hook Bay in Middletown Township, which has a population of approximately 68,200 people. The Mainside and Waterfront areas are connected by a narrow strip of land that serves as a government-controlled right-of-way containing a road and railroad. Site 16/F is located within the Mainside Area of NWS Earle, at the intersection of Macassar and Midway Roads. Access to the Mainside Area is via a secure entrance on Route 34. Future land use is not expected to vary significantly from current land use unless a major base realignment was to occur.

### **3.2 SITE HISTORY**

Site 16/F consists of groundwater contamination beneath a railroad maintenance yard resulting from leaks of diesel fuel and gasoline from an underground storage tank (UST) system. The system was removed in 1995, and extensive investigations were performed between 1995 and 1997 to delineate the extent of the contamination. A focused hydrogeologic investigation and site characterization for the remedial action work plan were performed in 1997. The groundwater contamination consists of a Light Non-Aqueous Phase Liquid (LNAPL) plume and a dissolved contaminant plume. The selected remedial action at the site is monitored natural attenuation for the dissolved contaminant plume. Remediation of the free product at Site 16/F is accomplished by means of a bioslurper system that is maintained and operated by the United States Department of the Navy (Navy).

The New Jersey Department of Environmental Protection (NJDEP) approved the remedial action and the Classification Exception Area (CEA) documents for the site in 1998. As part of the CEA, a groundwater monitoring program began in August 1998 and has proceeded on a quarterly basis since that time. The contaminants of concern for the site are benzene, toluene, ethylbenzene, xylene, and naphthalene. Sampling for methyl tert-butyl ether began during the Year 2 (2000) sampling event. Several occupied buildings border the groundwater contaminant plume. Historical sampling results indicate dissolved benzene concentrations in excess of NJDEP screening values for Vapor Intrusion (VI) in several site monitoring wells. The plume has not been sufficiently delineated to determine if there are benzene

exceedances within the NJDEP critical distance (guidelines) from the buildings, which would necessitate the performance of a VI investigation. Groundwater samples will be collected for benzene analysis using direct-push technology (DPT) to determine if a VI investigation is necessary based on NJDEP guidelines.

## 4.0 SCOPE OF WORK

This section of the HASP addresses proposed site activities that are to be conducted while performing the sampling and associated tasks. The specific tasks anticipated to be involved with this effort include the following:

- Mobilization/Demobilization including Utility Clearance and Global Positioning System Locating
- Groundwater Level Measurements
- Temporary Monitoring Well Installation via DPT
- Groundwater Sampling
- Decontamination
- Investigation-Derived Waste (IDW) Management

These are the only activities anticipated at this time. If it becomes apparent that additional or modified tasks must be performed beyond those listed above, the work will only proceed when the FOL or SSO notifies the Project Manager and the HSM, so that any appropriate modifications to this HASP can first be developed and communicated to the intended task participants.

## **5.0 IDENTIFYING AND COMMUNICATING TASK-SPECIFIC HAZARDS AND GENERAL SAFE WORK PRACTICES**

The purpose of this section is to identify the anticipated hazards and appropriate hazard prevention/hazard control measures that are to be observed for each planned task or operation. These topics have been summarized for each planned task through the use of task-specific Activity Hazard Analysis (AHA), which are to be reviewed in the field by the SSO with the task participants prior to initiating any task (see Attachment III). Additionally, potential hazard and hazard control matters that are relevant but are not necessarily task-specific are addressed in the following portions of this section.

Because NWS Earle is an active military installation, planned field activities will be coordinated with the POC and appropriate personnel.

Section 6.0 presents additional information on hazard anticipation, recognition, and control relevant to the planned field activities.

### **5.1 GENERAL SAFE WORK PRACTICES**

In addition to the task-specific work practices and restrictions identified in the AHAs attached to this HASP, the following general safe work practices are to be followed when conducting work on-site.

- 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 with soap and water 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.
- Keep monitoring equipment away from potentially contaminated surfaces.

- Plan and mark entrance, exit, and emergency evacuation routes.
- Rehearse unfamiliar operations prior to implementation.
- 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.
- 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).
- 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.

## **5.2 DPT SAFE WORK PRACTICES**

The following Safe Work Practices are to be followed when working in or around the DPT Rig Operations.

- Identify underground utilities and buried structures before commencing any DPT operations. Follow the Tetra Tech Utility Locating and Excavation Clearance Standard Operating Procedure.
- DPT rigs will be inspected by the SSO or designee, prior to the acceptance of the equipment at the site and prior to the use of the equipment.
- Repairs or deficiencies identified will be corrected prior to use.
- The inspection will be accomplished using the Equipment Inspection Checklist for DPT rigs provided in Attachment IV.
- After the initial inspection and release for use on site, additional inspections will be performed at least at the beginning of every 5 or 10-day shift, or following any repairs or significant maintenance activities.

- Ensure that all machine guarding is in place and properly adjusted.
- Block the DPT rig and use levelers to prevent inadvertent movement.
- The work area around the point of operation will be cleared to the extent possible to remove any trip hazards near or surrounding operating equipment.
- The driller's helper will establish an equipment staging and laydown plan.
- The work area will be kept clear of clutter and slips, trips, and fall hazards.
- Mechanisms to secure heavy objects such as DPT flights will be provided to avoid the collapse of stacked equipment.
- Minimize contact to the extent possible with contaminated tooling and environmental media.
- Potentially contaminated tooling will be placed on polyethylene sheeting for storage and wrapped for transport to the centrally located equipment decontamination area.
- Support functions (sampling and screening stations) will be maintained a minimum distance from the DPT rig of the height of the mast plus five feet, but not less than 25 feet around the rig.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the DPT rig.
- During maintenance, use only manufacturer provided/approved equipment (i.e. auger flight connectors, etc.).
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should be used to move auger flights and other heavy tooling.
- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone.
- Equipment used within the exclusion zone will undergo a complete decontamination and evaluation by the FOL and/or the SHSO to determine cleanliness prior to moving to the next location, exiting the site, or prior to down time for maintenance.

- Motorized equipment will be fueled prior to the commencement of the day's activities.
- When not in use, the DPT rig will be shutdown and emergency brakes set and wheels will be chocked to prevent movement.
- Investigative areas will be restored to equal or better condition than original to remove any contamination brought to the surface and to remove any physical hazards.
- In situations where these hazards cannot be immediately removed, the area will be barricaded to limit access.

### **5.3 SANITATION AND BREAK AREAS**

This section will address the following items:

- Toilets
- Potable water
- Showers and change rooms
- Break Areas

#### **5.3.1. Toilets**

The NWS Earle POC will coordinate with the FOL access to the washrooms located in Building C-36 (Hazardous Waste Storage Pad facility) located in immediate proximity of the site. Both potable water and toilets are located in the washroom.

#### **5.3.2 Potable Water**

Potable water as well as electrolyte balance sports drinks such as Gatorade will be provided to the field crews for fluid replacement, as it is necessary under conditions of ambient temperature extremes. Storage and dispensing will proceed as follows:

- All containers will be clean and replenished daily.
- All containers will clearly marked as to their contents (Potable Water – Drinking Water Only; Gatorade, etc.).

- Dispensing locations will be placed in identified break areas within the support zone. The most likely location will be at a support vehicle staged near the work area. This will serve as an area for cooling or warming as well as an identified food and drink consumption area.
- If larger containers are used, dispensing cups will be provided.
- The coolers used for storage of potable drinks and cups will be stored in plastic bags away from potentially contaminating materials when not in use.

See Section 4.0 of the HSGM for fluid intake recommendations.

### **5.3.3 Showers and Change Rooms**

Based on this scope and duration of this project shower facilities and locker rooms will not be required.

### **5.3.4 Break Areas**

Given the location and the time of the year structured suitable locations for work breaks and cooling regimens will reflect the ambient conditions anticipated for that time of the year. Portable shelters such as canopies can be provided for protection from the sun as well as to provide a suitable area to permit cooling in a hot environment. This may also be suitable for conducting certain field activities within a static position such as monitoring well installation and traffic control.

## 6.0 HAZARD ASSESSMENT AND CONTROLS

This section provides reference information regarding the chemical and physical hazards which may be associated with activities that are to be conducted as part of the scope of work.

### 6.1 CHEMICAL HAZARDS

Based on an evaluation of previous site data collected, in combination with historical information about the site, the primary contaminants of concern (COCs) at this site are VOCs. From a worst-case scenario, only benzene could potentially reach concentrations that exceed the ACGIH TLV TWA<sub>8</sub> and the OSHA PEL TWA<sub>8</sub>. Although this is a possibility, it is very unlikely that they will approach airborne concentrations reaching current occupational exposure limits (OEL). Table 6-1 shows the maximum benzene concentration detected in groundwater samples and a comparison of the potential worst case air concentration with current OELs.

**TABLE 6-1  
COMPARISON OF VOLATILE ORGANIC CONCENTRATIONS  
WITH CURRENT OCCUPATIONAL EXPOSURE LIMITS  
NWS EARLE**

Contaminant of Concern	Highest Concentration Previously Detected in Water	Worst-Case Air Concentration That Could Be Encountered	Current OSHA PEL and ACGIH TLV
Benzene	61.1 µg/l	4.23 ppm	1 ppm OSHA TWA <sub>8</sub> 0.5 ppm ACGIH TWA <sub>8</sub>

Table Notes:

TWA<sub>8</sub>: Average air concentration over an 8-hour work period that is not to be exceeded

As indicated in this table, from a worst-case scenario, benzene concentrations immediately above a captured air phase above values reported contaminated groundwater (such as in the head space of a sample jar) could reach concentrations that exceed the ACGIH TLV TWA<sub>8</sub> and the OSHA PEL TWA<sub>8</sub>. In regarding the results of this data evaluation, it is important to recognize the following:

- The planned work area is outdoors, with ample natural ventilation that will reduce any airborne benzene through dilution and dispersion.
- The groundwater value used in this evaluation was the highest concentration previously detected.

As a result of these factors, it is unlikely that workers participating in this activity will encounter any airborne concentrations of these COCs that would represent an occupational exposure concern. To

monitor this route, real-time direct reading monitoring instruments (PID) will be used (as described in Section 7.0).

### **6.1.1 Properties of COCs (VOCs)**

Various VOCs have been previously detected at low concentrations in the initial screening samples collected during site investigatory activities. In general, the majority of VOCs are related to chemical products such as chlorinated solvents and associated degradation products, or manufacturer products such as paint thinners, dry cleaning solvents, and constituents of petroleum fuels and crude oil tanking.

#### **6.1.1.1 Benzene**

Benzene is a colorless and highly flammable liquid with a sweet smell and a relatively high melting point. Because it is a known carcinogen, its use as an additive in gasoline is now limited, but it is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, and may be synthesized from other compounds present in petroleum. Benzene exposure has serious health effects. Outdoor air may contain low levels of benzene from tobacco smoke, wood smoke, automobile service stations, the transfer of gasoline, exhaust from motor vehicles, and industrial emissions. Vapors from products that contain benzene, such as glues, paints, furniture wax, and detergents, can also be a source of exposure, although many of these have been modified or reformulated since the late 1970s to eliminate or reduce the benzene content. Ambient air around hazardous waste sites or gas stations may contain higher levels of benzene.

The short term inhalation of high levels of benzene can result in death, while low levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods or liquids containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, and death.

The major effects from chronic (long-term) exposure to benzene is through the blood. Benzene damages the bone marrow and can cause a decrease in red blood cells, leading to anemia. It can also cause excessive bleeding and depress the immune system, increasing the chance of infection. Benzene causes leukemia and is associated with other blood cancers and pre-cancers of the blood.

## **6.2 PHYSICAL HAZARDS**

The following is a list of physical hazards that may be encountered at the site or may be present during the performance of site activities.

- Slip, trips, and falls
- Heat/Cold Stress
- Pinch/compression points
- Natural hazards (snakes, ticks, poisonous plants, etc.)
- Vehicular and equipment traffic
- Inclement weather

These hazards are discussed further below, and are presented relative to each task in the task-specific AHAs.

### **6.2.1 Slips, Trips, and Falls**

During site activities there is a potential for slip, trip, and fall hazards associated with wet, steep, or unstable work surfaces. To minimize hazards of this nature, personnel required to work in and along areas prone to these types of hazards will be required to exercise caution, and use appropriate precautions (restrict access, guardrails, life lines and/or safety harnesses) and other means suitable for the task at hand. Site activities will be performed using the buddy system.

### **6.2.2 Heat/Cold Stress**

It is always necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat/cold stress. Because of the geographical location of the planned work, the seasonal weather conditions, and the physical exertion that can be anticipated with some of the planned tasks, it is necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat stress. If such conditions are encountered use the following information on heat stress recognition, prevention, and control.

Ambient temperature extremes during this task will (hot working environments) may occur during performance of hazardous waste work depending on the project schedule. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress such as heat rash, heat cramps, heat exhaustion, and/or heat stroke.

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 them, and site management will be instructed to permit frequent breaks in mild temperature rest areas having hot/cold fluids available for consumption. In extreme cases, biological monitoring may be performed and

data compared to the most recent recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH).

### **6.2.2.1 Heat Related Disorders**

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

#### **6.2.2.1.1 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.

#### Signs and Symptoms

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

#### **6.2.2.1.2 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.

#### 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.

#### 6.2.2.1.3 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.

##### 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.

#### 6.2.2.1.4 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%. 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 have very vulnerable cells to 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.

##### 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

#### 6.2.2.1.5 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 SSO who may perform biological monitoring to determine the extent of the heat related condition.
- The SSO may alter the work regime that will provide adequate rest periods for cooling down. This may require additional shifts of workers.
- The SSO may also recommend cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.
- When conditions of heat related disorders may be experienced the SSO through site-specific training and safety briefing informed 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 SSO 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 6-2  
PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES  
NWS EARLE**

<u>Work-Rest Regimen</u>	<u>Work Load</u>		
	<u>Light</u>	<u>Moderate</u>	<u>Heavy</u>
Continuous	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 with an infrared or digital thermometer as early as possible in the resting period. Temperature 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 measured temperature exceeds 99.7°F at the beginning of the next rest period, the following work cycle shall be further shortened by 33%. Temperature 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 measured temperature above 99°F.

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

6.2.2.1.6 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
- 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 A.M. and 4 P.M. 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 6-3  
HEAT STRAIN SYMPTOMS  
NWS EARLE**

**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 If:**

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

### **6.2.3 Pinch/Compression Points**

Handling of tools, machinery, and other equipment on site may expose personnel to pinch/compression point hazards during normal work activities. Where applicable, equipment will have intact and functional guarding to prevent personnel contact with hazards. Personnel will exercise caution when working around pinch/compression points and using additional tools or devices (e.g., pinch bars) to assist in completing activities.

### **6.2.4 Natural Hazards**

Natural hazards such as poisonous plants, bites from poisonous or disease carrying animals or insects (e.g., snakes, ticks, mosquitoes) are often prevalent at sites that are being investigated as part of hazardous waste site operations. To minimize the potential for site personnel to encounter these hazards, nesting areas in and about work areas will be avoided to the greatest extent possible. Work areas will be inspected to look for any evidence that dangerous animals may be present.

During warm months (spring through early fall), tick-borne Lyme disease may pose a potential health hazard. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots and taped) will prevent initial tick attachment, while performing frequent body checks will help prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures and symptoms of exposure, consult Section 4.0 of the HSGM.

Contact with poisonous plants and bites or stings from poisonous insects are other potential natural hazards. Long sleeved shirts and long pants (tucked into boots), and avoiding potential nesting areas, will minimize the potential for exposure. Additionally, insect repellents may be used by site personnel. Personnel who are allergic to stinging insects (such as bees, wasps and hornets) must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet (see Attachment I of this HASP), and the FOL or SSO notified.

### **6.2.5 Vehicular and Equipment Traffic**

Hazards associated with vehicular and equipment traffic are likely to exist during various site activities. Site personnel will be instructed to maintain awareness of traffic and moving equipment when performing site activities.

**6.2.6 Inclement Weather**

Project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather (electrical storms, tornadoes, etc.) conditions arise, the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

## 7.0 AIR MONITORING

The primary COC (Benzene) has potential to be present in concentrations that could present an inhalation hazard during planned site activities. To assure that such exposures are avoided and non-exposure is documented, a direct reading instrument (PID) or (FID) will be used to monitor potential airborne concentrations during operational activities.

Persons using this instrument should be aware of the limitations of this instrument including it will not identify the compounds in question. However, the PID/FID will provide a response to substances whose ionization potential is within the working range of the lamp strength similar to those contaminants in question.

In addition, it is not currently planned to collect air samples analysis, given the low probability that any measurable VOC or Benzene concentrations will be detected in an outdoor environment. Should the real time monitoring indicate excursions near or above the action level of 1 ppm, air sampling may be conducted based on an evaluation of real time monitoring data by the PM, PHSO and HSM.

### 7.1 INSTRUMENTS AND USE

A Photoionization Detector (PID) using a lamp energy of 10.6 eV or a Flame Ionization Detector (FID) will be used to monitor the air when drilling temporary wells, and during groundwater sampling.

The PID/FID will be used primarily to monitor source points and worker breathing zone areas, while observing instrument action levels. The SSO shall obtain and document the daily background (BG) reading at an upwind, unaffected area and observe for readings above that BG level. The SSO shall monitor groundwater sample levels for the presence of any reading above the daily-established BG level. If elevated readings are observed, the SSO shall monitor the workers breathing zone (BZ) areas with the PID/FID. If the appropriate instrument Action Level is exceeded (see below), the following process will be followed:

- The SSO shall stop work and move site personnel upwind to a safe, unaffected area, where they will remain until further directed by the SSO.
- The SSO shall allow at least 5 minutes to pass so that the work area can ventilate, and will then re-approach the work area while continuously monitoring the BZ areas.

- Only when BG levels are regained in BZ areas will work be permitted to resume.
- If BG levels are not regained, the SSO will contact the PHSO for additional direction.

**Instrument Action Levels:** The use of a PID/FID will be acceptable, provided that the following action level is observed.

- PID Action Level: 0.5 ppm above BG in BZ areas for no more than four exposures extending greater than 5 minutes per occurrence in one work day.
- FID Action Level: 1.37 ppm above BG in BZ areas for no more than four exposures extending greater than 5 minutes per occurrence in one work day.

## **7.2 INSTRUMENT MAINTENANCE AND CALIBRATION**

Hazard monitoring instruments will be maintained and pre-field calibrated by the rental service employed. Operational checks and field calibration will be performed on the instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations (for example, the PID/FID must be field calibrated daily and an additional field calibration must be performed at the end of each day to determine any significant instrument drift). These operational checks and calibration efforts will be performed in a manner that complies with the employee's health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure. The calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration activities. This information may instead be recorded in a field operations logbook, provided that the information specified in Figure 7-1 is recorded. This required information includes the following:

- Date calibration was performed
- Individual calibrating the instrument
- Instrument name, model, and serial number
- Any relevant instrument settings and resultant readings (before and after) calibration
- Identification of the calibration standard (lot no., source concentration, supplier)
- Any relevant comments or remarks

## **7.3 DOCUMENTING INSTRUMENT READINGS**

The SSO is responsible for ensuring that the PID is used in accordance with the manufacturer's specifications/recommendations. In addition, the SSO is also responsible for ensuring that the instrument use is documented. This requirement will be satisfied by recording instrument readings in a field log

book. **This includes the requirement for documenting instrument readings that indicate no elevated readings above noted daily background levels (i.e., no-exposure readings).** At a minimum, the SSO must document the following information for each use of the PID:

- Date, time, and duration of the reading.
- Site location where the reading was obtained.
- Personnel present at the area where the reading was noted.
- Other conditions that are considered relevant to the SSO (such as weather conditions, possible instrument interferences, etc.).



## **8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS**

### **8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING**

This section is included to specify health and safety training and medical surveillance requirements for Tetra Tech personnel participating in on site activities. Tetra Tech personnel must complete 40 hours of introductory hazardous waste site training and three days of supervised on-site training prior to performing work at the NWS Earle. Tetra Tech personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training within the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e) (4) will be required for site supervisory personnel.

Documentation of training, certifications, and proof of competency will be provided to the RPM prior to work commencing. These documents will also be maintained onsite in accordance with the HASP. 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.

### **8.2 SITE-SPECIFIC TRAINING**

Tetra Tech SSO will provide site-specific training to Tetra Tech employees who will perform work on this project. Figure 8-1 will be used to document 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 will be employed to identify 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.

The Tetra Tech SSO will also conduct a pre-activities training session prior to initiating site work. This will consist of a brief meeting at the beginning of each day to discuss operations planned for that day, and a review of the appropriate AHAs with the planned task participants. A short meeting may also be held at the end of the day to discuss the operations completed and any problems encountered.

### **8.3 MEDICAL SURVEILLANCE**

Tetra Tech personnel participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR) Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response. All personnel working on site have had physical examinations under this program within the past 12 months and that they have been cleared, by a license physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory

protection. No personnel working on site have any medical restriction that would preclude him/her from working at the NWS Earle facility.



## **9.0 SITE CONTROL**

This section outlines the means by which Tetra Tech will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. 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 control zones will log-in and log-out on a daily basis. This information is to be recorded in the FOL or SSO daily log book.

### **9.1 EXCLUSION ZONE**

The exclusion zone will be considered the areas of the site of known or suspected contamination. Once redevelopment and sampling activities have been completed the potential for exposure is diminished and the area can then be reclassified as part of the contamination reduction zone. Therefore, the exclusion zones for this project will be limited to those areas of the site where active work (sample collection) is being performed plus a designated area of at least 10 feet surrounding the work area. Exclusion zones will be delineated as deemed appropriate by the FOL, through means such as erecting visibility fencing, barrier tape, cones, and/or postings to inform and direct personnel.

### **9.2 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 delineated 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.

### **9.3 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 where away from potential exposure to site contaminants during normal working conditions or foreseeable emergencies.

#### **9.4 ACTIVITY HAZARD ANALYSIS**

The work conducted in support of this project will be performed using AHAs to guide and direct field crews on a task by task basis. It is the FOL/SSO responsibility to review the AHAs with the task participants as part of a pre-task tail gate briefing session. This ensures that site-specific considerations and changing conditions are appropriately incorporated into the AHA, provide the SSO with a structured format for conducting the tail gate sessions, as well will also give personnel an opportunity to ask questions and make suggestions.

#### **9.5 SITE VISITORS**

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

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

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

Once access is obtained, personnel who require site access into areas of ongoing operations will be required to obtain permission from the PM. Upon gaining access to the site, site visitors wishing to observe operations in progress will be escorted by a Tetra Tech representative and shall be required to meet the minimum requirements discussed below:

- Site visitors will be directed to the FOL/SSO, who will sign them into the field logbook.
- Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.
- Site visitors wishing to enter the exclusion zone will be required to produce the necessary information supporting clearance to the site (see Section 8.0).

- To enter the site operational zones during planned activities, visitors will be required to first go through site-specific training and have been physically cleared to work on hazardous waste sites as stipulated in Section 8.2.
- Site visitors must be escorted and restricted from approaching any work areas where they could be exposed to hazards from Tetra Tech operations.

Once the site visitors have completed the above items, they will be permitted to enter the operational area. Visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Any incidence of unauthorized site visitation will cause the termination of onsite activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from local law enforcement personnel.

## **9.6 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 facility open to public access the first line of security is the security fencing around most of the site, with a gap in the fencing for access approximately 400 feet west of the site. The second line of security will take place at the work site referring interested parties to the NWS Earle POC.

## **9.7 SITE MAP**

Once the areas of contamination, access routes, topography, and dispersion routes are determined, the site map contained in the Work Plan will be generated and adjusted as site conditions change. These maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

## **9.8 BUDDY SYSTEM**

Personnel engaged in on site activities will practice the "buddy system" to ensure the safety of personnel involved in this operation.

## **9.9 MATERIAL SAFETY DATA SHEET (MSDS/SDS) REQUIREMENTS**

Tetra Tech and subcontractor personnel will provide MSDS/SDSs for chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of the chemicals

used on site will be developed using the HSGM. The MSDS/SDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

#### **9.10 COMMUNICATION**

Tetra Tech workers will be within sight of each other. If an emergency situation occurs, Tetra Tech will immediately notify NWS Earle Emergency Response (732-866-2911) who will then provide further direction. Because this is an active facility, Tetra Tech will be coordinating with the NWS Earle POC on a daily basis and NWS Earle base security. 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. Emergency numbers listed in Table 2-1 should be entered into site cell phones prior the beginning of work. The FOL will determine and arrange for telephone communication procedures.

## **10.0 SPILL CONTAINMENT PROGRAM**

### **10.1 SCOPE AND APPLICATION**

It is not anticipated that bulk hazardous materials (over 55-gallons) will be generated or handled at any given time as part of this scope of work. It is also not anticipated that such spillage would constitute a danger to human health or the environment. However, as the job progresses, some potential may exist for accumulating Investigative Derived Wastes (IDW) such as decontamination fluids, materials from well redevelopment (silt, water etc.), disposable sampling equipment and PPE.

### **10.2 POTENTIAL SPILL AREAS**

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, limited areas are vulnerable to this hazard including:

- Resource deployment
- Waste transfer
- Central staging

IDW may be generated as a result of this scope of work. If this occurs, it will be containerized, labeled, and staged to await further analyses. The results of these analyses will determine the method of disposal.

### **10.3 LEAK AND SPILL DETECTION**

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the contents will be transferred, using a hand pump, into a new vessel. The leak will be collected and contained using absorbents such as Oil-Dry, vermiculite, or sand, which are stored at the vulnerable areas in a conspicuously marked drum. This used material, too, will be containerized for disposal pending analysis. Inspections will be documented in the project logbook.

#### **10.4 PERSONNEL TRAINING AND SPILL PREVENTION**

Personnel will be instructed in the procedures for incipient spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and the SSO will serve as the Spill Response Coordinators for this operation, should the need arise.

#### **10.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT**

The following represents the types of equipment that should be maintained at the staging areas for the purpose of supporting this Spill Prevention/Containment Program.

- Sand, clean fill, vermiculite, or other non-combustible absorbent (Oil-dry)
- Drums (55-gallon U.S. DOT 1A1 or 1A2)
- Shovels, rakes, and brooms
- Container labels

#### **10.6 SPILL CONTROL PLAN**

This section describes the procedures the Tetra Tech field crew members will employ upon the detection of a spill or leak.

- Notify the SSO or FOL immediately upon detection of a leak or spill
- Activate emergency alerting procedures for that area to remove non-essential personnel
- Use the personal protective equipment stored at the staging area
- Take immediate action to stop the leak/spill
- Spread the absorbent material in the area of the spill, covering it completely
- Transfer the material to a new vessel; collect and containerize the absorbent material
- Label the new container appropriately
- Re-containerize spills, including 2-inch of top cover impacted by the spill
- Await test results for treatment or disposal options

It is not anticipated that a spill will occur that the field crew cannot handle. Should this occur, notification of the appropriate Emergency Response agencies will be carried out by the FOL or SSO in accordance with the procedures discussed in Section 2.0 of this HASP.

## 11.0 CONFINED-SPACE ENTRY

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 HASP are not allowed, under any circumstances, to enter confined spaces.** If the need arises for a confined space to be entered the FOL or SSO will notify the PHSO who will develop a site specific Confined Space Entry Program. The space will only be entered by site personnel when all the provisions of the Confined Space Entry Program have been met.

A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, manholes, sewers, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

Additionally, a Permit-Required Confined Space must also have one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly caving walls or by a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the HSGM or call the PHSO. 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 and appropriate modifications made to this HASP.

## 12.0 MATERIALS AND DOCUMENTATION

The Tetra Tech Field Operations Leader (FOL) shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP.
- HSGM.
- Incident Reports.
- Medical Data Sheets.
- Material Safety Data Sheets for chemicals brought on site, including decontamination solutions, fuels, sample preservatives, calibration gases, etc.
- A full-size OSHA Job Safety and Health Poster.
- Training/Medical Surveillance Documentation Form (Blank).
- First-Aid Supply Usage Form.
- Emergency Reference Form (Section 2.0, extra copy for posting).
- Directions to the Hospital.

### 12.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations where posting these documents is not feasible (such as no office trailer), these documents should be separated and immediately accessible.

**Chemical Inventory Listing (posted)** - This list represents the chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc. This list should be posted in a central area.

**MSDS/SDSs (maintained)** - The MSDS/SDSs should also be in a central area accessible to the site personnel. These documents should match the listings on the chemical inventory list for the substances employed on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents. Chemicals being brought on site include calibration gas provided by the equipment rental company which will be maintained in the supplied and labelled container within the equipment case. Sample preservatives will be supplied by the laboratory within each sample bottle. Sample bottles will be stored within the laboratory supplied cooler(s).

**The OSHA Job Safety & Health Protection Poster (posted)** - This poster should be conspicuously posted in places where notices to employees are normally posted, as directed by 29 CFR 1903.2 (a) (1).

Each FOL shall ensure that this poster is not defaced, altered, or covered by other material. See Attachment V of this HASP.

**Site Clearance (maintained)** - This list is found within the training section of the HASP (Figure 8-1). This list identifies the 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.

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

**Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be filled out by on-site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility.

**Personnel Monitoring (maintained)** - The results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

**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 purpose of maintaining or posting this information, as stated above, is to allow site personnel quick access. Variations concerning location and methods of presentation are acceptable providing the objective is accomplished.

### 13.0 ACRONYMS / ABBREVIATIONS

CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Contaminant of Concern
CSP	Certified Safety Professional
DRI	Direct Reading Instrument
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSA	Hollow Stem Auger
HSGM	Health and Safety Guidance Manual
HSM	Health and Safety Manager
HTRW	Hazardous, Toxic, Radioactive Waste
IDW	Investigation Derived Waste
N/A	Not Available
NIOSH	National Institute for Occupational Safety and Health
NJDEP	New Jersey Department of Environmental Protection
NWS	Naval Weapons Station
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PHSO	Project Health and Safety Officer
PM	Project Manager
PPE	Personal Protective Equipment
SSO	Site Safety Officer
TBD	To be determined
VOCs	Volatile Organic Compounds

**ATTACHMENT I**

**MEDICAL DATA SHEET**

## MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-site personnel and kept in the command post during the conduct of 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: \_\_\_\_\_

Phone: \_\_\_\_\_

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

Particular Sensitivities : \_\_\_\_\_

Do You Wear Contacts? \_\_\_\_\_

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

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

\_\_\_\_\_

\_\_\_\_\_

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

HIPAA took effect August 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 will 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 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.

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\_\_\_\_\_

Name (Print clearly)

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

**ATTACHMENT II**

**INCIDENT REPORT FORM**

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
INFORMATION ABOUT THE INCIDENT		
<b>Description of Incident</b>		
<hr/> <hr/> <hr/>		
<b>Date of Incident</b>	<b>Time of Incident</b>	
	_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>	
<b>Weather conditions at the time of the incident</b>	<b>Was there adequate lighting?</b>	
	_____ Yes <input type="checkbox"/> No <input type="checkbox"/>	
<b>Location of Incident</b>		
_____ Was location of incident within the employer's work environment? Yes <input type="checkbox"/> No <input type="checkbox"/>		
<b>Street Address</b>	<b>City, State, Zip Code and Country</b>	
<b>Project Name</b>	<b>Client:</b>	
<b>Tt Supervisor or Project Manager</b>	<b>Was supervisor on the scene?</b>	
	Yes <input type="checkbox"/> No <input type="checkbox"/>	
WITNESS INFORMATION (attach additional sheets if necessary)		
<b>Name</b>	<b>Company</b>	
<b>Street Address</b>	<b>City, State and Zip Code</b>	
<b>Telephone Number(s)</b>		

CORRECTIVE ACTIONS				
<b>Corrective action(s) immediately taken by unit reporting the incident:</b>				
<hr/> <hr/> <hr/> <hr/>				
<b>Corrective action(s) still to be taken (by whom and when):</b>				
<hr/> <hr/> <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				
<b>Level - 1</b>	<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>			
<b>Level - 2</b>	<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>			
<b>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.</b>				
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.

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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? [ ] Tetra Tech subcontractor employee (directly supervised by Tt personnel)? [ ]

Full Name

Company (if not Tt employee)

Street Address, City, State and Zip Code

Address Type

Home address (for Tt employees) [ ]

Business address (for subcontractors) [ ]

Telephone Numbers

Work: [ ] Home: [ ] Cell: [ ]

Occupation (regular job title)

Department

Was the individual performing regular job duties?

Time individual began work

Yes [ ] No [ ]

[ ] AM [ ] PM [ ] OR Cannot be determined [ ]

Safety equipment

Provided? Yes [ ] No [ ]

Type(s) provided: [ ] Hard hat [ ] Protective clothing

Used? Yes [ ] No [ ] If no, explain why

[ ] Gloves [ ] High visibility vest

[ ] Eye protection [ ] Fall protection

[ ] Safety shoes [ ] Machine guarding

[ ] Respirator [ ] 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 [ ] No [ ]

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 [ ] No [ ] If yes, request a copy of their completed investigation form/report and attach it to this report.



INJURY / ILLNESS DETAILS

What was the individual doing just before the incident occurred? 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"

Three horizontal lines for text entry.

What Happened? 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"

Four horizontal lines for text entry.

Describe the object or substance that directly harmed the individual: Examples: "Concrete floor"; "Chlorine"; "Radial Arm Saw". If this question does not apply to the incident, write "Not Applicable".

Two horizontal lines for text entry.

MEDICAL CARE PROVIDED

Was first aid provided at the site: Yes [ ] No [ ] If yes, describe the type of first aid administered and by whom?

One horizontal line for text entry.

Was treatment provided away from the site: Yes [ ] No [ ] If yes, provide the information below.

Table with 2 columns: Name of physician or health care professional, Facility Name, Street Address, City State and Zip Code, Telephone Number, Type of Care? (with sub-questions and checkboxes).

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

Table with 4 columns: 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 [ ] Equipment Damage [ ] Fire or Explosion [ ] Spill or Release [ ]

INCIDENT DETAILS

Results of Incident: 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)

Table with 3 columns: Item, Extent of damage, Estimated repair cost

SPILLS / RELEASES (Provide information for spilled/released materials)

Table with 3 columns: Substance, Estimated quantity and duration, Specify Reportable Quantity (RQ)

FIRES / EXPLOSIONS (Provide information related to fires/explosions)

Firefighting equipment used? Yes [ ] No [ ] If yes, type of equipment: \_\_\_\_\_

NOTIFICATIONS

Table with 4 columns: Required notifications, Name of person notified, By whom, Date / Time

Who is responsible for reporting incident to outside agency(s)? Tt [ ] Client [ ] Other [ ] Name: \_\_\_\_\_

Was an additional written report on this incident generated? Yes [ ] No [ ] 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.

Form with sections: Incident Report Number, INCIDENT DETAILS (Name of road, County, City, State, Police/Ambulance response), VEHICLE INFORMATION (Vehicle Number 1 - Tetra Tech Vehicle, Vehicle Number 2 - Other Vehicle), and Agent information.



Form with sections: DRIVER INFORMATION, PASSENGERS IN VEHICLES (NON-INJURED), INJURIES TO NON-TETRATECH EMPLOYEES, OTHER PROPERTY DAMAGE. Includes fields for vehicle numbers, driver details, passenger lists, and injury descriptions.



TETRA TECH, INC.

*Safety Excellence*

TETRA TECH, INC.  
INCIDENT FORM IR-C

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

A large, empty rectangular area with a thin black border, intended for drawing a diagram depicting an incident. The area is currently blank.

**ATTACHMENT III**

**ACTIVITY HAZARD ANALYSIS**



**ACTIVITY HAZARD ANALYSIS**  
**Mobilization/Demobilization**  
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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<p>at all times, a disposable camera, Tetra Tech Incident Form (IR-C).</p> <ul style="list-style-type: none"> <li>• Practice defensive driving whenever traveling in a vehicle. Always permit adequate room between you and the driver in front of your vehicle. Use the 4-second rule.</li> <li>• Follow the direction of posted signs (speed limits, etc.). You will be responsible for all moving and parking violations.</li> <li>• Exercise extra caution when moving through school and work zones.</li> <li>• All items in and on your vehicle should be secured to prevent movement or loss from the vehicle potential causing an accident.</li> </ul> <p>If you are in an accident:</p> <ul style="list-style-type: none"> <li>• Move you vehicle if possible from the travel lanes.</li> <li>• Turn on your emergency flashers.</li> <li>• Do not step into traffic when exiting your vehicle.</li> <li>• Place your warning triangle (100-feet behind your vehicle) and put on your Orange vest.</li> <li>• Contact the FOL and the SSO.</li> <li>• Be respectful to the Local authorities.</li> <li>• Do NOT attempt to argue whose fault.</li> <li>• DO NOT admit to fault.</li> <li>• Secure all valuables. Take the keys from the ignition if you leave your vehicle for any reason. (Be aware there will be a fee for towing, traffic citations, etc.).</li> <li>• Complete the IR-C form to make sure you have gathered all pertinent information</li> </ul>	
<p>2. Preparatory tasks, such as:  Assembling, packing, unpacking equipment and supplies.</p>	<p>2. Minor cuts, abrasions or contusions handling equipment and tools</p>	<p>2. Wear cut-resistant gloves when handling items with sharp or rough edges or when using knives to cut open packages. A cut resistant glove should at least be worn on the non-knife hand:</p> <ul style="list-style-type: none"> <li>• Exercise caution when unpacking boxes. Make sure you can see clearly into the box and do not reach in and contact broken glass (possibly damaged in shipment) or sharp articles.</li> <li>• Always cut away from yourself and others.</li> <li>• Do not place items to be cut on your hand and/or knee</li> <li>• Always use a sharp cutting instrument. Many accidents result from struggling with dull cutting implements.</li> <li>• Secure work pieces to be cut.</li> <li>• Carry and transport glassware in a hard sided container. That way if you fall, you will not fall on broken glass.</li> <li>• If there is broken glass place, it in a hardsided container for disposal. Placement in a soft sided container may result in cuts and lacerations if the bag is penetrated by shards of glass during carrying.</li> </ul>	<b>L</b>

**ACTIVITY HAZARD ANALYSIS**  
**Mobilization/Demobilization**  
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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		See Section 4.13 of the HSGM for additional safe work practices as it pertains cuts/lacerations.	
3. Unpacking; assembling; inspecting equipment before use	3. Strains or sprains during manual lifting and carrying activities	<p>3. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible), and plan each lift:</p> <ul style="list-style-type: none"> <li>• Inspect/clear the intended path of travel and areas where loads will be deposited,</li> <li>• test lift each object to ensure you can without injuring yourself,</li> <li>• ensure good grasp is obtainable on object,</li> <li>• keep back straight and lift with legs not back,</li> <li>• obtain help when needed to lift large, bulky, or heavy items.</li> </ul> <p>Remember: Your muscles, tendons, and ligaments are not as flexible in the early morning hours. Stretch before physical taxing activities. In the later afternoon, your muscles, tendons, and ligaments maybe stressed from fatigue. Take breaks as necessary to avoid injury.  See Section 4.4 of the HSGM for additional safe lifting practices.</p>	<b>L</b>
<p>3A. Performing Equipment inspections of vehicles and equipment arriving/preparing to depart the site</p> <ul style="list-style-type: none"> <li>• Equipment Inspection DPT drill rig(s); heavy equipment; and hand tools</li> </ul>	<p>3A. The following potential hazards may be encountered during the equipment inspection process</p> <ul style="list-style-type: none"> <li>• Flying projectiles – Pressurized systems –High pressure hydraulics</li> <li>• Cuts and lacerations</li> <li>• Pinch/compressions</li> <li>• Struck by</li> <li>• Injuries due to faulty equipment</li> </ul>	<p>3A. The purpose of the following inspections is to prevent possible injury from faulty equipment. However, as the equipment has to operate to test personnel may also be exposed to inherent hazards such as those described.</p> <p>DPT Drill Rigs:</p> <ul style="list-style-type: none"> <li>• Complete Equipment Inspection Checklist for the Drill Rigs and associated drilling components using Attachment IV. All emergency stop devices will be tested initially, then daily from that point on.</li> <li>• Do not place hands or fingers within pinch or compression points. If this is necessary (which it should never be) use blocking or tools intended for that purpose to secure potential energy sources.</li> </ul> <p>Inspector or selected Qualified person should employ hardhat, safety glasses, and leather work gloves during the inspection activity. All potential and kinetic energy sources will be secured or controlled during inspection.</p> <p>Sampling devices:</p> <ul style="list-style-type: none"> <li>• Threads of sampling devices will be examined. If they are washed out difficult to assemble and disassembled have them replaced.</li> <li>• Connectors, pins, associated attachments will not show signs of excessive wear. This will also pertain to wrenches employed to construct/disassemble pump assemblies. Check teeth and gripping surfaces to minimize the potential for slip.</li> <li>• Exercise caution when handling machine (drive tubes, drive rods, cutting shoes, etc.) components due to the potential for sharp edges</li> </ul>	<b>L</b>

**ACTIVITY HAZARD ANALYSIS**

**Mobilization/Demobilization**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
Equipment Inspection (continued)	3B. High pressure air lines – Struck by hazards	3B. To prevent hazards of this nature the following measures will be employed: <ul style="list-style-type: none"> <li>• All high pressure air 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> </ul>	L
Equipment Inspection (continued)	3C. Spills Prevention – <ul style="list-style-type: none"> <li>• Hydraulic fluid release – A hydraulic line that ruptures can release hydraulic fluid</li> <li>• Thermal Burns</li> </ul>	3C. During the Equipment Inspection additional attention will be focused to the condition of the hydraulic lines to avoid a potential rupture and/or release. This will include: <ul style="list-style-type: none"> <li>• Attention will be focused on connection points</li> <li>• 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> </li> </ul> In all cases, suspect hoses will be replaced.  It is recommended where possible, that plastic be placed on the ground in the area under the rig to capture incidental spills and releases should they occur. Care should be taken not to extend the plastic beyond the rig proper as such creating a slip trip and fall hazard.	L
4. Hazard Communication - Receiving chemicals, storing chemicals, preparing to use chemicals, collecting Material Safety Data Sheets completing chemical Inventory;	4. Chemical Exposure	4. It is not anticipated that site personnel will encounter chemical hazards as it pertains to mobilization as no direct encounter is planned. However, it will be the responsibility of the FOL and/or the SSO to implement the Onsite Hazard Communication Program (See Section 5.0 of the HSGM). In this effort all chemicals brought onsite (compressed gases (calibration gases), decontamination fluids; sample preservatives, well construction supplies, etc.) will: <ul style="list-style-type: none"> <li>• All chemicals will have an accompanying Materials Safety Data Sheet (MSDS/SDS) or Safety Data Sheet (SDS) SSDS that has been reviewed and approved for use by the SSO.                             <ul style="list-style-type: none"> <li>○ The SSO will review the HASP to ensure emergency equipment and/or associated PPE necessary to ensure the safety of the workers are equal or better than that listed in the MSDS/SDS.</li> </ul> </li> <li>• All incoming containers will be properly labeled, will be in English and not defaced. If the materials will be transferred to temporary containers, these too will be appropriately labeled by the SSO or the person using the materials.</li> <li>• All materials received onsite will be added to the Chemical Inventory List. Included in this information is the volume and location stored and primary hazards.</li> <li>• All materials will be stored as prescribed with compatible chemicals.</li> <li>• As necessary employ spill prevention pans or like equipment to capture or contain spills within the storage area.</li> </ul>	L

**ACTIVITY HAZARD ANALYSIS**  
**Mobilization/Demobilization**  
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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
<p>5. Initial Site Surveys - Access/egress into Controlled areas</p> <p>Initial site survey of the intended work areas</p>	<p>5. Coordinate efforts with facility personnel</p> <ul style="list-style-type: none"> <li>• Inherent hazards or restrictions</li> </ul> <p>Emergency Prevention – This component will be critical in identifying potential emergencies that may be task associated. These are as follows:</p> <ul style="list-style-type: none"> <li>• Utility strike – Overhead power lines; buried utilities; gas, sewage, and/or water.</li> <li>• Physical hazards – Steep embankments, sink holes; poisonous vegetation.</li> </ul> <p>Determining site control boundaries</p>	<p>5. In order to address the potential hazards associated with the initial entry:</p> <ul style="list-style-type: none"> <li>• The FOL and/or the SSO will meet with the restricted area personnel/operators to ensure they are aware of planned activities.</li> <li>• As part of these discussions Inquire of the potential hazard in the area and areas to avoid.</li> <li>• Inquire as to what the facilities Emergency Action Requirements are should there be an emergency and where you should go as an assembly point.</li> <li>• What security measures are required</li> <li>• PPE requirements for location (such as flame retardant clothing)</li> <li>• Restriction boundaries</li> <li>• If persons must enter the restricted area local requirements will prevail. These include: <ul style="list-style-type: none"> <li>○ Signing in</li> <li>○ PPE minimum requirements for the location</li> </ul> </li> <li>• The FOL and/or the SSO will survey the area to ensure areas prone to slip, trip, and fall hazards are flagged or removed. <ul style="list-style-type: none"> <li>○ Entry/access routes will be determined as well as schedules.</li> </ul> </li> </ul> <p>All workers are to wear sturdy work shoes that are outfitted with slip resistant aggressive tread and steel toe and shank when foot hazards exist.</p> <p>All exits and selected access pathways will be maintained free of obstructions to allow free movement of site personnel, equipment, and if necessary emergency equipment.</p> <p>Utility strikes –</p> <ul style="list-style-type: none"> <li>• Overhead power lines – In the areas in which the mast will be raised will be examined for the existence of overhead power lines or obstructions.</li> <li>• Personnel will perform 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> </ul> </li> </ul> <p>The FOL/SSO will determine the necessary boundary at each work location:</p> <ul style="list-style-type: none"> <li>• DPT drilling operations – 35-feet or the height of the mast + 10-feet, whichever is greater. During this time, the FOL and/or the SSO will determine if physical hazards exists, terrain challenges and the necessary amount of vegetation to be removed (where applicable) to allow access and a sufficient size work area.</li> </ul>	<p><b>L</b></p>

**ACTIVITY HAZARD ANALYSIS**  
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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
	Emergency preparation <ul style="list-style-type: none"> <li>Selecting evacuation routes and assembly points; determining emergency equipment requirements</li> </ul>	<ul style="list-style-type: none"> <li>High pressure decontamination 35-feet surrounding the point of operation.</li> <li>Low pressure decontamination 10-feet surrounding point of operation.</li> </ul> <p>The Emergency Evacuation point will be selected as part of the initial site survey. Tentatively this location is at the driveway intersection where emergency response crews will approach from. Dependent on the location of the hazard escape may have to occur in the opposite direction. A secondary point will be determined in the field and communicated as part of the Daily Tail-Gate meeting.</p>	
6. Preparing the site for work activities.	6. Site set up hazards: <ul style="list-style-type: none"> <li>Struck By</li> <li>Tip Over</li> <li>Backing</li> <li>Electrocution / Explosion</li> <li>Slips, Trips, Falls</li> </ul>	6. Struck by/ Tip Over: <ul style="list-style-type: none"> <li>All equipment, augers, rods and tools will be properly secured during transport.</li> <li>All vehicles and equipment to be employed on roads and highways will comply with DOT requirements.</li> <li>Never move the drilling rig with the mast upright. Set hydraulic leveling jacks before raising the mast. Ensure the drilling site foundation is stable and as level as possible.</li> <li>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. This is especially critical as this is within a process area and movement is tight.</li> </ul> <p>Utility damage prevention:</p> <ul style="list-style-type: none"> <li>Inspect for buried and overhead utilities in the vicinity of the drilling location. A drilling clearance permit shall be obtained from base personnel or utility companies prior to initiating intrusive operations.</li> </ul> <p>Slip, trips, and falls:</p> <ul style="list-style-type: none"> <li>Practice good housekeeping to keep the ground around the drilling site clear of obstructions, 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 ground surfaces.</li> </ul>	<b>L</b>
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
DPT Drill Rig; Sampling attachments; Hand tools (dollies, hand carts, hand knives, carpenter tools, fixed and portable ladders, etc.)	Visual inspection of hand and power tools will be performed by the SSO. Tools will be tagged with colored electrical tape. Green tape ok for use. Red tape do not use. All red taped items should be	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>	

**ACTIVITY HAZARD ANALYSIS**  
**Mobilization/Demobilization**  
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EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
	<p>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 SSO 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 MSDS/SDSs 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>Personal Protective Equipment:  <u>Minimum:</u> Steel toed work boots; hardhats, safety glasses, work gloves; suitable work attire (long pants; sleeved shirts.  <u>Optional items:</u> High visibility vest, Hearing protection and flame retardant protective clothing; may be required in the area the work will be conducted.  <u>HTRW:</u> None anticipated for this task.  Note: Personnel may be required to meet location specific PPE requirements.</p>	<p>Initial PPE inspection performed by SSO. 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 SSO 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 SSO 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> </ul> <p>AHA Assessment - During the initial walk through the FOL and/or the SSO shall review the AHA to determine applicability or information that will need added given site specific conditions.</p>





## ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> Temporary Monitoring Well Installation via Direct Push Technology (DPT)		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>M</b>		
<b>Project Location:</b> Earle								
<b>Contract Number:</b> N62470-08-D-1001		<b>Severity</b>	<b>Probability</b>					
<b>Site:</b> Site 16/F			Frequent	Likely	Occasional	Seldom	Unlikely	
<b>Date Prepared</b> November 2013			Catastrophic	E	E	H	H	M
<b>Prepared by:</b> Clyde Snyder			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: (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				E= Extremely High Risk		
		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.				H= High Risk		
				M= Moderate Risk				
				L = Low Risk				
ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS				RAC		
1. DPT Drill rig - Unit Mobilization / 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>Materials falling from the drill rig during transport.</li> <li>Equipment failure – leading to a potential accident or hazardous situation.</li> <li>Improper operation</li> <li>Unqualified operator</li> </ul>	<ol style="list-style-type: none"> <li>1. The vehicle operator will perform a walk around inspection to ensure               <ul style="list-style-type: none"> <li>All equipment, augers, rods and tools will be properly secured for/during transport.</li> <li>Vehicle components – Turn signals brake lights, etc. all function properly.</li> <li>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>All critical fluid levels (brake fluid, motor oil, anti-freeze) are at their recommended levels.</li> <li>Seat belts are functioning properly.</li> <li>Mirrors are properly adjusted.</li> <li>Cell phone use during driving is prohibited unless a hands free device is used.</li> <li>If the vehicle GVWR is greater than 26,001 pounds, the operator will have a Commercial Driver's License (CDL).</li> <li>If the vehicle has air brakes, the CDL will have an air brake endorsement.</li> <li>The vehicle will be operated within DOT or facility specific guidelines including adhering to the speed limit obeying all posted signs.</li> <li>Where necessary, use escort vehicles with flashing lights to warn and control</li> </ul> </li> </ol>				<b>L</b>		

**ACTIVITY HAZARD ANALYSIS**

**Soil boring with DPT and temporary well installation**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
	Vehicle accidents	local traffic when moving large equipment to support area. <ul style="list-style-type: none"> <li>• Practice defensive driving whenever traveling in a vehicle</li> <li>• 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 are acceptable).</li> <li>• Keep a safe distance between cars (Use the 4-second rule).</li> </ul>	
2. Preparing the Drill Rig for Use	2. Injury due to the failure of faulty equipment	2. The FOL, SSO, 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 IV. <ul style="list-style-type: none"> <li>• The 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.</li> </ul>	<b>L</b>
3. Personnel qualifications/ equipment integrity	3. Injury due to Improper operation	3. Ensure the driller or driller’s helper responsible for the transport and/or operation are qualified to do so. 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> <li>• If consistent poor work habits are employed personnel will be removed and replaced as determined to be necessary to protect onsite personnel, property, and the environment.</li> </ul>	<b>M</b>
4. Positioning Unit (engaging outriggers. etc.)	4. Struck by/ Rig stability	4. When moving the drill rig into place: <ul style="list-style-type: none"> <li>• Prior to committing personnel and/or resources, the FOL and/or the SSO 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.</li> <li>• The operator in concurrence with the FOL and/or the SSO should select the best possible approach vantages to move the unit up the slope or around physical obstructions to the selected boring location.</li> <li>• Preview travel paths and set up location for subsurface utilities, soft spots, curbs, etc.</li> <li>• These items may affect the stability of the rig during operation.</li> <li>• Use pads for outriggers to avoid potentially damaging subsurface utilities or to control subsidence during drilling.</li> </ul>	<b>M</b>

**ACTIVITY HAZARD ANALYSIS**  
**Soil boring with DPT and temporary well installation**  
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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ul style="list-style-type: none"> <li>• Operate the unit at a suitable rpm for the terrain and conditions.</li> <li>• Ground spotters will be used to move the rig into place to avoid damaging subsurface process lines or overhead power lines.               <ul style="list-style-type: none"> <li>○ Do not place yourself between the rig and an immovable object.</li> <li>○ Stay within the operators 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> <li>○ Only one person will direct the actions of the operator.</li> </ul> </li> <li>5. The DPT Drill Rig Outriggers (where applicable – depending on manufacturer) that is equipped with outriggers to provide stability to the unit during drilling operations. Check the following:               <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?                   <ul style="list-style-type: none"> <li>○ If not cribbing can be used to increase the foot print size.</li> </ul> </li> <li>• Is the ground surface in the area of the outrigger placement adequately compacted to support the drill rig?                   <ul style="list-style-type: none"> <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> </ul> </li> </ul> </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>	
5. Emergency Preparation - Assembling equipment and supplies	5. Fire , Spill and Injury	<p>5. A number of measures will be employed to prepare for potential emergency conditions including:</p> <p><i>Fire -</i></p> <ul style="list-style-type: none"> <li>• Portable Fire Extinguisher(s) – 2A:10B:C extinguisher will be made available for all general support activities. Travel distances greater than 50-feet will require additional fire extinguishers. If portable extinguishers are provided then training in their use must be provided for the employees who are to use them. Fire extinguishers will be initially inspected then monthly thereafter. Fire extinguishers will be immediately accessible. If they are stored in tool boxes, the box will be labeled as such.</li> </ul> <p><i>Spill Response -</i></p> <ul style="list-style-type: none"> <li>• Spills –Release from hydraulic lines during the drilling operation can cause environmental damage. Rapid response using the site spill kit can limit the damage and prophylactic measures such as placing plastic under the drill rig</li> </ul>	<b>L</b>

**ACTIVITY HAZARD ANALYSIS**

**Soil boring with DPT and temporary well installation**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<p>that would provide ground protection. Additional measures include:</p> <ul style="list-style-type: none"> <li>○ Having spill pads at the ready.</li> <li>○ Using spill pads during incidental fueling operations.</li> <li>○ Use of safety cans and</li> <li>○ Periodic monitoring of potential spill or release areas such as IDW management marshaling areas.</li> </ul>	
6. Pre – Drilling clearance	6. Utility Damage – Injury, property damage	<p>6. An excavation or dig permit will be required anytime the ground surface is broken using a mechanized piece of equipment. To obtain a Dig Permit</p> <ul style="list-style-type: none"> <li>• Mark the areas to be drilled in White Paint – Also identify it as the area for One-Call or whatever the clearance designation is for that state.</li> <li>• Contact the Indiana Underground Plant Protection Service at (800) 382 - 5544 or use 811 that is the National Clearinghouse contact point.</li> <li>• Where possible provide drawings and/or coordinates.</li> <li>• The typical timeline required is 2-3 days.</li> <li>• Upon receipt of your permit, make sure all utility owners in the area have responded back. If not, contact them. This is especially critical when dealing with electrical and gas lines.</li> <li>• 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>• 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>• Follow Tt Utility Clearance Procedures.</li> </ul> <p>The Tetra Tech SOP Utility Location and Excavation Clearance can be found in Section 7.0 of the HSGM.</p>	<b>L</b>
7. Tool and material handling (cont.)	7. Lifting – Due to the weights of the various drill tooling the potential for back related injuries are significant.	<p>7. The auger flights weigh in excess of 100 lbs. Due to the physically demanding nature of handling these devices back injuries as well as smashed fingers often result. To control these hazards</p> <ul style="list-style-type: none"> <li>• Use proper lifting techniques when manually handling rods, augers and tools. Use mechanical equipment during lifting whenever possible (hoisting devices). Use the buddy system when lifting tools and supplies. Stretch in the morning to limber your muscles, tendons, and ligaments prior to engaging in heavy lifting activities. Take more breaks in the afternoon to guard against fatigue related injuries.</li> <li>• Review Section 4.4 of the HSGM for additional safe lifting practices.</li> </ul>	<b>L</b>

**ACTIVITY HAZARD ANALYSIS**

**Soil boring with DPT and temporary well installation**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
8. Drill Rig Operation	8. Excessive Occupational Noise	<p>8. Noise levels associated with DPT drilling rigs have ranged from 92 to 107dBA during percussion hammering. Due to the magnitude of these levels provisions for hearing protection is required. These measures are as follows:</p> <ul style="list-style-type: none"> <li>• Unit operator and helper(s) are to wear hearing protection. 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>• Onsite personnel may use the general rule of thumb when determining if noise levels are excessive  <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> <p>Based on accumulated data, operations requiring hearing protection will be specified in the site specific health and safety plan.</p> <ul style="list-style-type: none"> <li>• The SSO responsible for monitoring the use of hearing protection, ensuring the hearing protection selected have a sufficient noise reduction rating (at least 25 dB).</li> <li>• Implementing the site specific Hearing Conservation Program found in Section 6.0 and posting 29 CFR 1910.95 when hearing protection is required.</li> </ul>	<b>L</b>
9. Drill Rig Operations (continued)	9. Exposure to site contaminants (Benzene) by skin contact/absorption, ingestion, and Inhalation	<p>9. The concentrations associated with Benzene are considered likely the likelihood of reaching airborne concentrations that could result in exposure is unlikely. The DPT Drill rig also occupies a small foot print and disturbs little dust due boring advancement. The use of area wetting will be employed to control visible airborne dust.</p> <p>To control exposure through skin contact, absorption, and/or ingestion personnel handling contaminated media will:</p> <ul style="list-style-type: none"> <li>• Wear surgeons gloves when handling potentially-contaminated media and samples,</li> <li>• Avoid contact with potentially-contaminated media to the extent possible,</li> <li>• Follow good decontamination and practice good personal hygiene (hands and face washing) when exiting work area,</li> <li>• Hand-to-mouth activities in the work area will be prohibited (eating, drinking, smoking, etc.).</li> <li>• Practice good housekeeping to avoid the spread of contamination.</li> <li>• Work from the least contaminated toward the source to avoid potential cross contamination</li> <li>• Air monitoring in breathing zone with a FID/PID with an action level of</li> </ul>	<b>L</b>



**ACTIVITY HAZARD ANALYSIS**  
**Soil boring with DPT and temporary well installation**  
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EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Work Areas	<p>where applicable</p> <p>FOL and/or the SSO 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>	<ul style="list-style-type: none"> <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 SSO will be responsible for insuring the first aid kits are fully stocked and replenished as supplies are used.</p> <p>The SSO 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>Personal Protective Equipment:</p> <p><u>Minimum:</u> Steel toe boots, safety glasses, hardhat, hearing protection cotton or leather gloves when handling drill tooling; Nitrile with grip support for handing contaminated tooling. Nitrile gloves when handling samples or other potentially-contaminated media.</p> <p><u>HTRW:</u> benzene</p>	<p>Initial PPE inspection will be performed by the user (prior to each use).</p> <p>The SSO will monitor use/application of PPE by the users. The SSO will address any deficiencies noted at the occurrence then at Tail Gate Safety Meetings.</p> <p>PID/FID</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 SSO 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>SSO trained in proper calibration, use, and care of air monitoring devices used (PID). This is a general component of 40 hour HAZWOPER training, and SSO must become very familiar with the Operator’s Manual for any instrument used.</p> <p>PID or FID must be calibrated as per the manufacturer’s recommendations and documented on each use.</p>

**ACTIVITY HAZARD ANALYSIS**  
**Soil boring with DPT and temporary well installation**  
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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> Decontamination – Hand tools and associated equipment. This is a low pressure application		Overall Risk Assessment Code (RAC) (Use highest code)				<b>M</b>	
<b>Contract Number:</b> N62470-08-D-1001		<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Site:</b> Site 16/F							
<b>Date Prepared:</b> November 2013		<b>Probability</b>					
<b>Prepared by:</b> Clyde Snyder		<b>Severity</b>	Frequent	Likely	Occasional	Seldom	Unlikely
<b>Reviewed by:</b> J. Carothers, PhD		Catastrophic	E	E	H	H	M
		Critical	E	H	H	M	L
		Negligible	M	L	L	L	L
<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>					
<b>ACTIVITY / PHASE</b>	<b>POTENTIAL HAZARDS</b>	<b>RECOMMENDED ACTIONS / CONTROLS</b>				<b>RAC</b>	
1. Site set up Decontamination of non-dedicated hand tools and equipment can take place onsite or at a centralized location.	1. Slips trips and fall  1A. Struck by	1. To prevent these types of hazards the following measures will be incorporated: <ul style="list-style-type: none"> <li>Station placement – Keep the decon station far enough back from the operation to allow room to work.</li> <li>Practice Good housekeeping – Keep tubing and tools gathered and organized to prevent a tripping hazard.</li> <li>Do not lay items around on the floor or ground where someone could step on them and go down.</li> <li>Clear other obstructions in the area that may present trip hazards.</li> </ul> 1A. Allow sufficient room to handle tooling without inadvertently striking someone.				L	
2. Washing and rinsing process	2. Contaminant accumulation - Contaminant exposure <ul style="list-style-type: none"> <li>Benzene</li> </ul>	2. Based on reported source concentrations the contaminant levels are not anticipated to be extremely elevated. To minimize exposure <ul style="list-style-type: none"> <li>Wear nitrile gloves, safety glasses, and an impermeable apron to prevent saturation of clothing.</li> <li>Change out the wash water frequently to insure adequate decontamination but also protect from overloading contaminants.</li> <li>Personnel involved in the decontamination process will themselves wash reusable garments (impermeable aprons);</li> </ul>				L	

**ACTIVITY HAZARD ANALYSIS**

**Decontamination**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ul style="list-style-type: none"> <li>• Follow good decontamination practices (work from top down and outside in). Surgeon's gloves are to be the last item of PPE removed;</li> <li>• Change gloves regularly and wash hands and face before any hand to mouth activities.</li> <li>• Keep decon areas orderly, maintain good housekeeping.</li> </ul>	
<p>3. Decon procedure</p> <ul style="list-style-type: none"> <li>• Decontamination will include: Flushing tubing using a soap/water solution prior to disposal as general refuse.</li> </ul>	<p>4. Hazard Communication</p> <p>a., b. - Incidental spills - Slips, Trips, Falls</p> <p>c. Contaminant exposure</p>	<p>4. The SSO will complete the Site Specific Hazard Communication Program. This includes</p> <ul style="list-style-type: none"> <li>• Recording chemicals employed onsite for decontamination onto a Chemical Inventory List</li> <li>• MSDS/SDSs are available to all personnel and they are aware of the hazards associated with each.</li> <li>• The SSO has reviewed the documents for completeness and have also determined if there are additional equipment (PPE and/or Emergency equipment) that is needed.</li> </ul> <p>a., b. The decontamination will employ 5 gallon buckets with soap and water and rinse water contained in mortar tubs to serve as secondary containment to control incidental spills. Wash waters will be containerized in buckets with the lids on to control spills and off gassing into the transport vehicles.</p> <p>c. Benzene PID/FID Action Levels: 0.5/1.37 ppm above BG in BZ areas for no more than four exposures extending greater than 15 minutes per occurrence in one work day.</p>	L
<b>Decontamination – High Pressure</b>			
Decontamination of heavy equipment and large tooling (e.g., vehicles, etc.) using pressure washer	1. Noise	1. Pressure washer operator must wear hearing protection (muffs or plugs with NRR of at least 25 dB)	L
	2. Flying projectiles/water lacerations	<p>2. Restrict other personnel from decon pad where decontamination is occurring during pressure washing operations.</p> <ul 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>• Restrict pressure washer to 3000psi with not less than 15° deflection tip</li> <li>• Pressure washer operator must wear full face shield over safety glasses with side shields, hardhat, rainsuit, apron, and or boot covers may be required during heavy equipment decon operations</li> </ul>	M
	3. Falling objects	<ul style="list-style-type: none"> <li>• Place items to be decontaminated on ground or on washing/drying racks in a manner that they are secure and will not fall.</li> <li>• Wear safety toe safety footwear.</li> </ul>	L
	4. Slips, trips, and falls	4. Keep hoses gathered when not in use.	L

**ACTIVITY HAZARD ANALYSIS**

**Decontamination**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS		RAC
		<ul style="list-style-type: none"> <li>• Configure decon pad so the hoses may be run in an area not employed by pedestrian (employee) traffic.</li> <li>• As a tarp or plastic containment will be placed on the ground to serve as containment, this may become slippery. Where necessary apply a light coating of sand to enhance traction.</li> <li>• Keep waters collected in the pad pumped to a minimal level as not to disguise trip hazards.</li> </ul>		
EQUIPMENT TO BE USED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
Hand tools (hand brushes, garden sprayers, hoses, etc.) Pressure washer		When decontaminating equipment check equipment for deficiencies report to the SSO.	All personnel participating in this activity must be current with HAZWOPER training requirements as specified in Mobilization/Demobilization.	
<p><b>Personal Protective Equipment: <u>Minimum:</u></b></p> <ul style="list-style-type: none"> <li>• Nitrile gloves.</li> <li>• Safety glasses</li> <li>• Rain suit or moisture-repellant disposable coveralls or impermeable apron, when there is a potential for the saturation of work clothing.</li> </ul> <p><b><u>Optional items:</u></b> As determined by the SSO based on site specific conditions.</p>		<p>Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.</p> <p>PID or FID must be calibrated as per the manufacturer's recommendations and documented on each use.</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 SSO 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.	

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> Groundwater sampling and Groundwater Level Measurements		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>L</b>	
<b>Project Location:</b> Earle							
<b>Contract Number:</b> N62470-08-D-1001		<b>Severity</b>	<b>Probability</b>				
<b>Site:</b> Site 16/F			Frequent	Likely	Occasional	Seldom	Unlikely
<b>Date Prepared:</b> November 2013		Catastrophic	E	E	H	H	M
<b>Prepared by:</b> Clyde Snyder		Critical	E	H	H	M	L
<b>Reviewed by:</b> Jennifer Carothers, PhD		Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L
<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)					
		"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 Risk</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 Risk</b>	
		<b>M= Moderate Risk</b>		<b>L= Low Risk</b>			
<b>JOB STEPS</b>	<b>HAZARDS</b>	<b>CONTROLS</b>					<b>RAC</b>
Groundwater sampling	1. Chemical exposure (benzene)	<ol style="list-style-type: none"> <li>1. Wear surgeons' gloves when handling potentially-contaminated media and samples. Avoid contact with potentially-contaminated media to the extent possible.</li> <li>2. Practice good personal hygiene (hands and face washing) when exiting work area. Hand-to-mouth activities in the work area are prohibited (eating, drinking, smoking, etc.).</li> <li>3. Exposure via dermal contact and ingestion represent some limited concern during this task.</li> <li>4. Periodically screen sample with PID/FID. If readings above daily-established background levels (BGLs) are noted in borehole, monitor worker breathing zone (BZ) areas. If readings in worker BZ areas exceed the action level (0.5/1.37 ppm for the PID/FID for 4 exposures of 5 minutes each in any one work day): <ul style="list-style-type: none"> <li>• After at least 5 minutes, SSO will approach from upwind direction screening BZ areas.</li> <li>• Work may resume when readings in the BZ return to BGLs</li> </ul> </li> </ol>					L

**ACTIVITY HAZARD ANALYSIS**

**Groundwater and Soil Sampling and Groundwater Level Measurement**

JOB STEPS	HAZARDS	CONTROLS		RAC
	2. Cuts and lacerations  3. Slips, Trips, Falls        4. Inclement weather	1. Always cut away from yourself and others. Do not place items to be cut in your hand or on your knee. 2. Change blades as necessary to maintain a sharp cutting edge as many accidents result dull cutting attachments. 3. Wear cut-resistant gloves (leather or heavy cotton) at least on the non-knife/saw hand, where possible. When cutting acetate liners use the tubing retention tub to secure the tube. 4. Use the knife intended for appropriate purpose. <ul style="list-style-type: none"> <li>• Maintain good housekeeping in IDW storage areas, keeping it clear of loose debris and other potential tripping hazards.</li> <li>• Wear appropriate foot protection to prevent slips and trips.</li> <li>• Use caution when working on uneven and wet ground surfaces.</li> </ul> 5. The FOL and/or the SSHO will temporarily suspend outside activities in the event of electrical storms or high winds. <ul style="list-style-type: none"> <li>• It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed.</li> <li>• However, when this is not possible field personnel should use the 30/30 Rule: <i>"If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."</i></li> </ul>		L
EQUIPMENT TO BE USED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
hand and sampling tools  <b>Personal Protective Equipment:</b> <u>Minimum:</u> Safety toe boots, safety glasses <u>Optional items:</u>  <b>Monitoring Instruments:</b> FID/PID		Visual inspection prior to use by user.  PID or FID must be calibrated as per the manufacturer's recommendations and documented on each use.	1. Review of AHA during pre-task tailgate safety briefing with all intended task participants.	
<b>Personal Protective Equipment: <u>Minimum:</u></b> Safety toe boots, safety glasses. <b><u>Optional items:</u></b> Hardhat, hearing protection Nitrile surgeon's style gloves and Tyvek if there is a change to soil clothing. <b><u>HTRW:</u></b> Benzene		Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	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 SSO 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.	

**ACTIVITY HAZARD ANALYSIS**  
**Groundwater and Soil Sampling and Groundwater Level Measurement**  
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I have read and understand this AHA:

<b>Name (Printed)</b>	<b>Signature</b>	<b>Date</b>



## ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> Global Positioning (GPS) Survey	Overall Risk Assessment Code (RAC) (Use highest code)	<b>L</b>
<b>Project Location:</b> Earle	<b>Risk Assessment Code (RAC) Matrix</b>	
<b>Contract Number:</b> N62470-08-D-1001	<b>Severity</b>	<b>Probability</b>
<b>Site:</b> Site 16/F		Frequent    Likely    Occasional    Seldom    Unlikely
<b>Date Prepared:</b> November 2013	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>
<b>Prepared by:</b> Clyde Snyder	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:</b> (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 Risk</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 Risk</b>
		<b>M= Moderate Risk</b>
		<b>L= Low Risk</b>

JOB STEPS	HAZARDS	CONTROLS	RAC
<ul style="list-style-type: none"> <li>• Evaluate Global Positioning System (GPS) accuracy</li> <li>• Establish investigation area boundary</li> <li>• Survey transect end points with GPS/Total Station</li> </ul>	1. Minor cuts, abrasions or contusions	1. Wear cut-resistant gloves when handling items with sharp or rough edges.	<b>L</b>
	2. Heavy lifting (muscle strains and pulls)	1. Practice safe lifting techniques. 2. Use mechanical lifting devices such as a tow wheel cart or 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).	<b>L</b>
	3. Vehicular traffic when moving large equipment to the support area	1. Designate and mark vehicle and equipment staging areas. 2. Inform the site personnel of heavy equipment areas and of their responsibility to stay clear of moving vehicles. 3. In high traffic areas, wear a high-visibility vest, shirt or jacket.	<b>L</b>

**ACTIVITY HAZARD ANALYSIS (AHA)**

**Global Positioning Survey**

JOB STEPS	HAZARDS	CONTROLS	RAC
	4. Slips, Trips, Falls	<ol style="list-style-type: none"> <li>Maintain good housekeeping practices in work areas.</li> <li>Preview walking areas, look for uneven terrain, tree branches, roots, weeds, limbs and other ground hazards.</li> <li>Wear appropriate foot protection to prevent slips and trips.</li> <li>Use caution when working on wet ground surfaces.</li> </ol>	L
	5. Intermittent high noise levels	<ol style="list-style-type: none"> <li>Although not considered a highly probable event, based on anticipated activities, the use of hearing protection may occasionally be required.</li> <li>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 (approx. 2') of them.</li> <li>Hearing protection is to consist of either ear muffs or plugs that have a noise reduction rating (NRR) of at least 25 decibels (dB).</li> </ol>	L
	6. Inclement weather	<ol style="list-style-type: none"> <li>Temporarily suspend outside activities in the event of electrical storms or high winds.</li> <li>It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed.</li> <li>However, when this is not possible field personnel should use the 30/30 Rule: <i>"If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."</i></li> </ol>	L
	7. Chemical Exposure	<ol style="list-style-type: none"> <li>As direct contact will be minimal given the nature of the work, it is unlikely that exposure will occur.</li> </ol>	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.
<p><b>Personal Protective Equipment:</b>  <b>Minimum:</b>                      Safety toe boots, and safety impact eye protection, work gloves, work clothes.  <b>Optional items:</b> Hard Hats and Hearing protection, High-visibility vests when near active traffic areas.                      Safety toe/shank boots are required when working in areas where there is a danger of foot injuries due to falling or rolling objects or of objects piercing the sole (footwear will satisfy American National Standards Institute (ANSI) Z-41 requirements for protective footwear) shall be used.  <b>HTRW:</b> benzene</p>		PPE inspection	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 SSO 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.

**ACTIVITY HAZARD ANALYSIS (AHA)**

**Global Positioning Survey**

**Page 3 of 3**

**I have read and understand this AHA:**

<b>Name (Printed)</b>	<b>Signature</b>	<b>Date</b>



## ACTIVITY HAZARD ANALYSIS (AHA)

<b>Activity/Work Task:</b> IDW Management	Overall Risk Assessment Code (RAC) (Use highest code)	<b>L</b>				
<b>Contract Number:</b> N62470-08-D-1001	<b>Risk Assessment Code (RAC) Matrix</b>					
<b>Site:</b> Site 16/F						
<b>Date Prepared:</b> November 2013	<b>Severity</b>	<b>Probability</b>				
<b>Prepared by:</b> Clyde Snyder		Frequent    Likely    Occasional    Seldom    Unlikely				
<b>Reviewed by:</b> J. Carothers, PhD	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>
	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)					
	"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 Risk</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 Risk</b>	
				<b>M= Moderate Risk</b>		
				<b>L = Low Risk</b>		

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
1. Storage Area set up	1. Traffic hazards; Material handling hazards	<p>1. This area should be easily accessible in order to place and remove the drums accumulated.</p> <p>To further reduce material handling hazards, support spill containment and control, and sampling when necessary, the IDW storage area should be structured as follows:</p> <ul style="list-style-type: none"> <li>• Maximum 4-drums to a pallet with retaining ring bolt and label on the outside for easy access/reference.</li> <li>• Maintain a minimum of 4-feet between each row of pallets. This is the minimum distance necessary to wheel drums on a drum dolly.</li> <li>• If the site is not secured, the satellite storage area shall be fenced and signs placed indicating the following:               <ol style="list-style-type: none"> <li>a. Primary Point of Contact (make sure they know they been identified as the primary point of contact).</li> <li>b. Phone Number</li> <li>c. Emergency Contact (If different from the primary)</li> </ol> </li> <li>• Provide a Drum/Container Inventory to the Primary Point of Contact and to Emergency Services, if they deem it necessary. The inventory should contain:               <ol style="list-style-type: none"> <li>a. Each drum shall be assigned a unique identification number. This number shall be placed on the label and drum shell using a paint marker (Note: Do not paint the number on the lid as these have a tendency to get exchanged from time to time.)</li> </ol> </li> </ul>	L

**ACTIVITY HAZARD ANALYSIS (AHA)**  
**IDW Management**  
**Page 2 of 4**

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		b. Types of waste materials (decontamination waters; purge waters, etc.) c. Volumes (Full or level associated with the container after completion of the project location) d. Where it was derived from (The site and/or wells) e. Dates (When filling began) f. Contact – For more information  Ensure all lids are secured.	
2. Material Handling	2. Lifting (strain/muscle pulls)	<ul style="list-style-type: none"> <li>• Use mechanical means (i.e. dollies, etc.) to move and handle containers. Use proper lifting techniques described in Section 4.4 of the Health and Safety Guidance Manual (HSGM).</li> <li>• Fill drums and buckets only to 80% to minimize some of the weight and incidental spill issues.</li> <li>• Use help to move and place drums</li> </ul> <b>Reminder:</b> The drums you are attempting to move, lift and/or relocate may weigh on the average of <ul style="list-style-type: none"> <li>• 55-Gallon container of purge or decontamination waters = ~500 lbs. (including the container)</li> </ul>	L
3. Placing the drums	3. Pinches and compressions	3. During placement of drums/containers on pallets use machinery or assistance from another person where possible. Keeps hand out of the area between drums during placement. It is best to place the drums and pallets then transport buckets to fill the drums already placed. Wear steel toed shoes with adequate lug to support traction when moving heavy containers. Use machinery where possible to place drums.	L
4. Spill prevention and protection • Staging and Labeling Containers.	4. Chemical contaminants exposure	<b>4)</b> Generally encountering contaminants during this activity is low unless the contents of a container must be transferred due to a faulty container [leak(s)]. The outside of containers should be cleaned of residual waters (e.g. splashes, etc.) to avoid potentially exposing all who come in contact. The FOL and/or the SSO will: <ul style="list-style-type: none"> <li>• Ensure the outsides of all drums moved to the staging area are washed/wiped clean.</li> </ul>	L
<b>Spill Containment</b> - Within this scope of work the primary area of concern regarding spills and/or releases are associated with <ul style="list-style-type: none"> <li>• Collection point – This is being addressed through using mortar tubs as secondary containment.</li> <li>• Moving/Handling the drums/containers of waste materials. This can be minimized based on the method of picking these drums up and the method of transport.               <ul style="list-style-type: none"> <li>○ Use the proper lifting appliances such as drum grapplers, drum dollies, etc.,. Secure containers for movement over long distances.</li> <li>○ Care should also be exercised when using a backhoe or similar device to lift the drums. This sometimes results in a bucket tooth into the drum again resulting in a release.</li> <li>○ Place the drums onto a lift gate and flat bed with removable sides for transport to the staging area.</li> </ul> </li> </ul>			

**ACTIVITY HAZARD ANALYSIS (AHA)**

**IDW Management**

<p>This section describes the procedures the Tetra Tech field personnel will employ upon the detection of a spill or leak.</p> <ul style="list-style-type: none"> <li>• Initiate incidental response measures, including             <ul style="list-style-type: none"> <li>○ Employ the personal protective equipment (see below). Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel (for containers). Spread the absorbent material in the area of the spill, covering it completely.</li> <li>○ Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.</li> </ul> </li> <li>• Re-containerize spills, including 2-inch of top cover (if over soils) impacted by the spill. Await test results for treatment or disposal options.</li> <li>• Notify the SSO or FOL immediately upon detection of a leak or spill and actions taken or employed.             <ul style="list-style-type: none"> <li>• Personal Protective Equipment                 <ul style="list-style-type: none"> <li>- Nitrile outer gloves</li> <li>- Splash Shield</li> <li>- Impermeable over-boots</li> <li>- Rain suits</li> </ul> </li> </ul> </li> </ul>		
<p><b>Hazard Monitoring Required:</b>                  Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.). Monitoring will only be employed if Spill Containment is implemented.                  Periodic visual inspection for leaks when filling drums or those at the staging area.</p>	<p><b>Decontamination Procedures:</b>                  Not required, unless spill containment protocol is implemented. Then the following will apply</p> <ul style="list-style-type: none"> <li>• Once the spill is secured and all of the spill equipment has been through a soap and water wash and rinse.</li> <li>• Personnel will wash/rinse outer protective garment with soap and water.</li> <li>• Remove outer protective garments.</li> <li>• Wash hands and face.</li> </ul>	<p><b>Permits/Requirements:</b></p> <ul style="list-style-type: none"> <li>• Complete IDW Inventory List</li> </ul>
<p><b>Training Required</b></p> <ul style="list-style-type: none"> <li>• 29 CFR 1910.120 (e) Site Specific Training, See Figure 8-1</li> </ul> <p><b>Medical Clearance/Surveillance Required</b></p> <ul style="list-style-type: none"> <li>• Completed a Medical Data Sheet (See Attachment I)</li> </ul>	<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 and Emergency Contact List (Posted and a copy placed in your First-Aid Kit.</li> <li>- Spill Kit (Oil dry, wood shavings, or other absorbent materials, Shovels, brooms, Oil absorbent pads</li> </ul>	<p><b>H&amp;S Supporting Program Requirements</b></p> <p>None required.</p>

**ACTIVITY HAZARD ANALYSIS (AHA)**  
**IDW Management**  
**Page 4 of 4**

All persons upon review will sign off on this AHA prior to participating in these activities.

<b>Name (Printed)</b>	<b>Signature</b>	<b>Occupation</b>	<b>Date of Review or Training</b>

**ATTACHMENT IV**

**EQUIPMENT INSPECTION CHECKLIST**

### Equipment Inspection Checklist for DPT Rigs

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

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

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

Time: \_\_\_\_ : \_\_\_\_

Equipment Type: \_\_\_\_\_

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

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

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Stop Devices <ul style="list-style-type: none"> <li>• Emergency Stop Devices (At points of operation)</li> <li>• Have all emergency shut offs identified been communicated to the field crew?</li> <li>• Has a person been designated as the Emergency Stop Device Operator?</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Highway Use <ul style="list-style-type: none"> <li>• Cab, mirrors, safety glass?</li> <li>• Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?</li> <li>• Seat Belts?</li> <li>• Is the equipment equipped with audible back-up alarms and back-up lights?</li> <li>• Horn and gauges</li> <li>• Brake condition (dynamic, park, etc.)</li> <li>• Tires (Tread) or tracks</li> <li>• Windshield wipers</li> <li>• Exhaust system</li> <li>• Steering (standard and emergency)</li> <li>• Wheel Chocks?</li> <li>• Are tools and material secured to prevent movement during transport? Especially those within the cab?</li> <li>• Are there flammables or solvents or other prohibited substances stored within the cab?</li> <li>• Are tools or debris in the cab that may adversely influence operation of the vehicle (in and around brakes, clutch, gas pedals)</li> </ul>	

**Equipment Inspection Checklist for Drill Rigs**

Page 2

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

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

Yes	No	NA	Requirement	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"/>	<b>Fluid Levels:</b> <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"/>	<b>High Pressure Hydraulic Lines</b> <ul style="list-style-type: none"> <li>• Obvious damage</li> <li>• Operator protected from accidental release</li> <li>• Coupling devices, connectors, retention cables/pins are in good condition and in place</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"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>Mast Condition</b> <ul style="list-style-type: none"> <li>• Structural components/tubing</li> <li>• Connection points</li> <li>• Pins</li> <li>• Welds</li> <li>• Outriggers</li> <li>• Operational</li> <li>• Plumb (when raised)</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>Safety Guards –</b> <ul style="list-style-type: none"> <li>• Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?</li> <li>• Hot pipes and surfaces exposed to accidental contact?</li> <li>• High pressure lines</li> <li>• Nip/pinch points</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>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>	

**Equipment Inspection Checklist for Drill Rigs**

Page 3

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

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

Yes	No	NA	Requirement	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"/>	PPE Required for Drill Rig Exclusion Zone <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"/> <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"/>	Other Hazards <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>- MSDS/SDSs available?</li> </ul> </li> <li>• Will On-site fueling occur                             <ul style="list-style-type: none"> <li>- Safety cans available?</li> <li>- Fire extinguisher (Type/Rating - _____ )</li> </ul> </li> </ul>	

Approved for Use     Yes     No     See Comments

\_\_\_\_\_  
Site Health and Safety Officer

\_\_\_\_\_  
Operator

**ATTACHMENT V**

**OSHA POSTER**

# Job Safety and Health

## It's the law!

# OSHA

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

### EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

### EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

**This free poster available from OSHA –  
The Best Resource for Safety and Health**



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

**1-800-321-OSHA**  
[www.osha.gov](http://www.osha.gov)

OSHA 3165-12-06R