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LETTER REGARDING THE TRANSMITTAL OF HEALTH AND SAFETY PLAN FOR SITE  
ASSESSMENT OF UNDERGROUND STORAGE TANK SITE 20 NAS PENSACOLA FL  
7/23/2002  
TETRA TECH

**TETRA TECH NUS, INC.**

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September 23, 2002

Project Number 2642

Commander  
Southern Division  
Naval Facilities Engineering Command  
ATTN: Mr. Byas Glover  
Remedial Project Manager  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Reference: Clean Contract No. N62467-94-D-0888  
Contract Task Order No. 0273

**Subject: Health and Safety Plan for Site Assessment Addendum at Underground Storage Tank Site 0020, Naval Air Station Pensacola, Pensacola, Florida**

Dear Mr. Glover:

Tetra Tech NUS is pleased to submit the Final Health and Safety Plan (HASP) for Site Assessment Addendum at Underground Storage Tank Site 0020, Naval Air Station Pensacola, Pensacola, Florida. We do not expect any comments on this document but if you have any concerns please contact me.

If you have any questions, please call me at (850) 385-9899.

Sincerely yours,

Gerald Walker, P.G.  
Project Manager

GAW/gaw

Enclosure

c: Debbie Wroblewski (Cover Letter Only)  
Mark Perry/(unbound)  
Matt Soltis  
~~T. Manasseo me~~

**Health and Safety Plan  
Site Assessment Report  
Addendum/Remedial Action Plan**  
at  
**UST Site 0020**  
for  
**Naval Air Station Pensacola**  
Pensacola, Florida



**Southern Division  
Naval Facilities Engineering Command**  
Contract No. N62467-94-D-0888  
Contract Task Order 0273

September 2002

HEALTH AND SAFETY PLAN  
SITE ASSESSMENT REPORT ADDENDUM/REMEDIAL ACTION PLAN  
AT  
UST SITE 0020  
FOR  
NAVAL AIR STATION PENSACOLA  
PENSACOLA, FLORIDA

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

Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Submitted by:  
Tetra Tech NUS, Inc.  
661 Andersen Drive  
Pittsburgh, Pennsylvania 15220

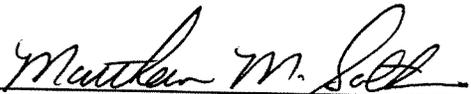
CONTRACT NUMBER N62467-94-D-0888  
CONTRACT TASK ORDER

SEPTEMBER 2002

PREPARED UNDER THE  
SUPERVISION OF:

  
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TALLAHASSEE, FLORIDA

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CLEAN HEALTH & SAFETY MANAGER  
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## 1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been written to encompass site activities that are to be conducted at various properties associated with Naval Air Station Pensacola (NAS Pensacola), Pensacola, Florida as part of Contract Task Order (CTO) 0273. Specifically, this HASP addresses the additional investigation activities that will be conducted at NAS Pensacola, UST Site 0020. This HASP is being prepared for NAS Pensacola as part of an overall effort conducted under Comprehensive Long-Term Environmental Action Navy (CLEAN III) administered through the U.S. Navy Southern Division Naval Facilities Engineering Command (NAVFAC), as defined under Contract Number N62467-94-D-0888. In addition to the HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Environmental Health and Safety Guidance Manual must be present at the site during the performance of site activities. The Guidance Manual provides detailed information pertaining to the HASP, as well as TtNUS Standard Operating Procedures (SOP's). Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site. The HASP will be modified if new information becomes available. Changes to the HASP will be made by the Project Health & Safety Officer (PHSO) and approved by the TtNUS Health and Safety Manager (HSM) and the Task Order Manager (TOM). The TOM will notify affected personnel of changes.

The elements of this HASP are in compliance with the requirements established by OSHA 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (HAZWOPER), and sections of 29 CFR 1926, "Safety and Health Regulations for Construction". The information contained in this plan, as well as policies on conducting onsite operations, have been obtained from the TtNUS Health and Safety Program.

### 1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

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

- The TtNUS TOM is responsible for the overall direction of health and safety for this project.

- The PHSO is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
  - i. Providing information regarding site contaminants and physical hazards associated with the site.
  - ii. Establishing air monitoring and decontamination procedures.
  - iii. Assigning personal protective equipment based on task and potential hazards.
  - iv. Determining emergency response procedures and emergency contacts.
  - v. Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
  - vi. Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
  - vii. Modify this HASP, as it becomes necessary.
  
- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed SSO. The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
  
- The SSO supports site activities by advising the FOL on health and safety aspects. These duties may include:
  - i. Coordinates health and safety activities with the FOL.
  - ii. Selects, applies, inspects, and maintains personal protective equipment.
  - iii. Establishes work zones and control points in areas of operation.
  - iv. Implements air monitoring program for onsite activities.
  - v. Verifies training and medical clearance of onsite personnel status in relation to site activities.
  - vi. Implements Hazard Communication, Respiratory Protection Programs, and other associated health and safety programs as they may apply to site activities.
  - vii. Coordinates emergency services.
  - viii. Provides site-specific training for onsite personnel.
  - ix. Investigates accidents and injuries (see Attachment I - Illness/Injury Procedure and Report Form)
  - x. Provides input to the PHSO regarding the need to modify, this HASP, or applicable health and safety associated documents as per site-specific requirements.
  
- Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS CLEAN HSM.

Note: In some cases one person may be designated responsibilities for more than one position. For example, at NAS Pensacola the FOL may also be responsible for SSO duties. This action will be performed only as credentials, experience, and availability permits.

## 1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Naval Air Station Pensacola Address: Pensacola, Florida

Navy Remedial Project Manager: Byas Glover Phone Number: (843) 820-5651

Navy Environmental Coordinator: Greg Campbell Phone Number: (850) 452-4611 ext. 103

Purpose of Site Visit: This activity is groundwater sampling only.

Proposed Dates of Work: October 2002 until completion

### **Project Team:**

TtNUS Personnel:

Discipline/Tasks Assigned:

Gerald Walker

Task Order Manager (TOM)

Michael Akers

Deputy Task Order Manager (TOM)

TBD

Field Operations Leader (FOL)

Matthew M. Soltis, CIH, CSP

CLEAN Health and Safety Manager (HSM)

Clyde J. Snyder

Project Health and Safety Officer (PHSO)

TBD

Site Safety Officer (SSO)

### **Non-TtNUS Personnel**

### **Affiliation/Discipline/Tasks Assigned**

TBD

Drilling Subcontractor(s)

TBD

Hazard Assessments (for purposes of 29 CFR 1910.132) and HASP preparation conducted by:

Clyde J. Snyder

TBD - To be determined

## 2.0 EMERGENCY ACTION PLAN

### 2.1 INTRODUCTION

This section is part of a preplanning effort to direct and guide field personnel in the event of an emergency. Site activities will be coordinated with NAS Pensacola fire protection and emergency services prior to commencement. In the event of an emergency, which cannot be mitigated using onsite resources, personnel will evacuate to a safe place of refuge and the FOL will contact "911" to report the emergency. Site personnel may transport ill workers or those who have non-serious injuries to medical facilities, provided that such transport can be done safely. 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. NAS Pensacola Emergency Dispatch will be notified anytime outside response agencies are contacted. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

TtNUS will, through necessary services, include initial response measures for incidents 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, injury or illness resulting from exposure to chemical or physical hazards or fire are the most probable emergencies that can be encountered during site activities. To minimize and eliminate these potential emergency situations, emergency planning activities associated with this project include the following. The SSO and/or the FOL are responsible for:

- Coordinating response actions with NAS Pensacola Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.
- Establishing and maintaining information at the project staging area (Support Zone) for easy access in the event of an emergency. This information includes the following:

- Chemical Inventory (for substances used onsite), with Material Safety Data Sheets.
  - Onsite personnel medical records (medical data sheets).
  - A logbook identifying personnel onsite each day.
  - Emergency notification phone numbers in site vehicles
- 
- 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.

It is the responsibility of the TtNUS FOL to ensure that this information is available and present at the site.

## **2.3 EMERGENCY RECOGNITION AND PREVENTION**

### **2.3.1 Recognition**

Foreseeable emergency situations that may be encountered during site activities will generally be recognizable by visual observation. A clear knowledge of the signs and symptoms of overexposure to contaminants of concern may alert personnel of the potential hazards concerning themselves or their fellow workers. These potential hazards, the activities with which they have been associated, and the recommended control methods are discussed in detail in sections 5.0 and 6.0 of this document. Additionally, early recognition will be supported by periodic site surveys to eliminate any conditions that may predispose site personnel or properties to an emergency. The FOL and the SSO will constitute the site evaluation committee responsible for these periodic surveys. Site surveys will be conducted at least once a week during the initiation of this effort.

The above actions will provide early recognition for potential emergency situations. Should an incident take place, TtNUS will take defensive and offensive measures to control these situations. However, if the FOL and/or the SSO determine that an incident has progressed to a serious emergency situation, TtNUS will withdraw, and notify the appropriate response agencies.

### **2.3.2 Prevention**

TtNUS and subcontractor personnel will minimize the potential for emergencies by ensuring compliance with the HASP, the Health and Safety Guidance Manual, applicable OSHA regulations, and through periodic site surveys of work areas.

## **2.4 SAFE DISTANCES AND PLACES OF REFUGE**

In the event that the site must be evacuated, personnel will immediately stop activities and report to the FOL at the place of safe refuge. Safe places of refuge will be determined prior to commencement of site activities and will be conveyed to personnel as part of the daily safety meeting conducted each morning. Upon reporting to the refuge location, personnel will remain there until directed otherwise by the TtNUS FOL. The FOL or the SSO will take a head count at this location to confirm the location of site personnel. The site logbook will be used to take the head count. Places of refuge will ideally be selected which offer a point for communication purposes should this be required.

## **2.5 EVACUATION ROUTES AND PROCEDURES**

Once an evacuation is initiated, personnel will proceed immediately to the designated place of refuge, unless doing so would further jeopardize the welfare of workers. In such an event, personnel will proceed to a designated alternate location (to be identified) and remain there until further notification from the FOL. The use of these locations as assembly points provides communication and a direction point for emergency services, should they be needed.

Evacuation procedures will be discussed prior to the initiation of any work at the site. This shall include identifying primary and secondary evacuation routes and assembly points. Evacuation routes from the site 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 influence the designation of evacuation routes. As a result, assembly points at NAS Pensacola will be selected, and in the event of an emergency, field personnel will proceed to these points by the most direct route possible without further endangering themselves.

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

Since TtNUS personnel will not always be working in the proximity of each other, hand signals, voice commands, air horns, and/or two-way radios may comprise the mechanisms to alert site personnel of an emergency.

If an incident occurs, site personnel will initiate the following procedures:

- Initiate incident alerting procedures (if needed) verbally, by air horn, or using two-way radios.
- Evacuate non-essential personnel.
- Initiate initial response procedures.

- Describe to the FOL (who will serve as the Incident Commander) what has occurred in as much detail as possible.

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and/or the SSO will enact emergency notification procedure to secure additional outside assistance in the following manner:

- Call 911 for outside emergency service and report the emergency to the NAS Pensacola Emergency Dispatch (See Table 2-1)
- Give the emergency operator the location of the emergency and a brief description of what has occurred.
- Stay on the phone follow the instructions given by the operator
- The appropriate agency will be notified and dispatched

If an incident occurs at outside of our designated operating areas impacting field personnel, the following procedures are to be initiated:

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns, or two-way radio.
- Call Navy On-Site Representative
- Proceed to the assembly points as directed by NAS Pensacola or other Navy personnel.

## **2.7 EMERGENCY CONTACTS**

Prior to performing work at the site, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an incident. A mobile phone shall be available at the sites. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. These numbers will be used for the sites to be visited during this project. This table must be posted at the sites where it is readily available to site personnel.

**TABLE 2-1**  
**EMERGENCY CONTACTS**  
**NAS PENSACOLA**

| AGENCY   | TELEPHONE                    |
|--|------------------------------|
| EMERGENCY (outside services)<br>(Police, Fire, and Ambulance Services) | 911                          |
| NAS Pensacola - Emergency Dispatch                                     | (850) 452-3333               |
| Navy Engineer-in-Charge - Byas Glover                                  | (843) 820-5651               |
| Navy Environmental Coordinator – Greg Campbell                         | (850) 452-4611 Ext. 103      |
| Navy Hospital  | (850) 505-6601               |
| Baptist Hospital   | (850) 469-2313               |
| Florida Poison Control Center  | (800) 222-1222               |
| TtNUS Tallahassee Office   | (850) 385-9899               |
| Task Order Manager Gerry Walker  | (850) 385-9899               |
| Deputy Task Order Manager Michael Akers                                | (850) 385-9899               |
| CLEAN Health and Safety Manager<br>Matthew M. Soltis, CIH, CSP         | (412) 921-8912               |
| Project Health and Safety Officer<br>Clyde J. Snyder                   | (412) 921-8904               |
| WorkCare   | (800) 455-6155<br>(Ext. 109) |

## 2.8 ROUTE TO HOSPITALS

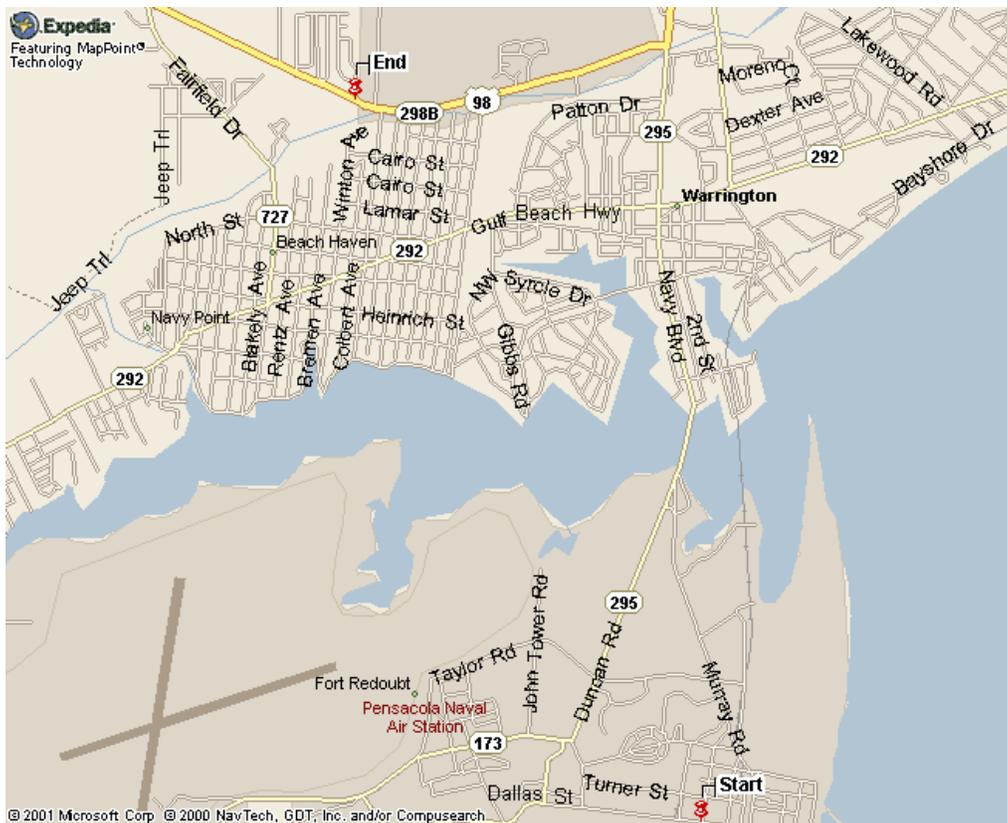
For emergency care only, non-Navy personnel are permitted to go to the Navy Hospital.

Navy Hospital  
Highway 98  
Pensacola, Florida  
(850) 505-6601

Directions to the Navy Hospital from the Main Gate of NAS Pensacola are as follows:

Proceed out of Main Gate (Navy Blvd) heading north to US Highway 98. Turn left (heading west) on US 98 and proceed approximately 1 mile. Hospital will be on the right (Building 2268).

**FIGURE 2-1A**  
**Route to Hospital**



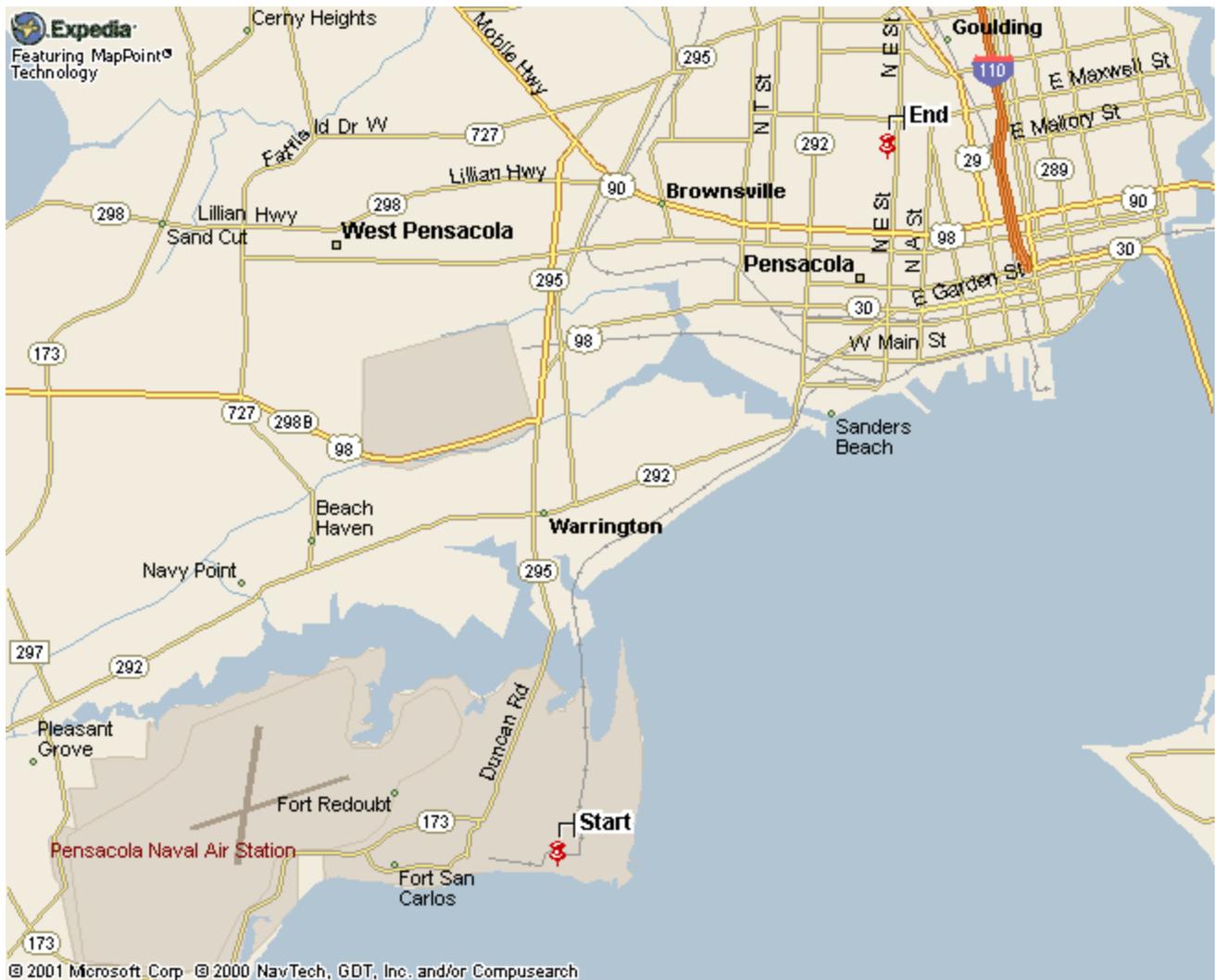
**Non Emergency Hospital:**

Baptist Hospital  
1000 West Moreno Blvd.  
Pensacola, FL 32508  
(850-469-2313)

Directions to this Hospital from the Main Gate of NAS Pensacola are:

Proceed out of Main Gate (Navy Blvd) heading north to Hwy 292. Turn right (heading east) on Hwy 292 until it turns into Garden Street (approx. 3 miles). Take Garden Street to intersection with "E" Street. Turn left onto "E" Street and proceed approximately 1 mile to Hospital on left.

**FIGURE 2-1B**  
**ROUTE TO BAPTIST HOSPITAL**



## **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 not be performed 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.

TtNUS personnel will perform removal of personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only first-aid level support. Medical attention above that level will require assistance and support from the designated emergency response agencies. **If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-2.**

## **2.10 INJURY/ILLNESS REPORTING**

If any TtNUS personnel are injured or develop an illness as a result of working at the site, the TtNUS "Injury/Illness Procedure" (Attachment I) must be followed. Following this procedure is necessary for documenting the information obtained at the time of the incident.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical service personnel. This information is listed on Medical Data Sheets (Attachment V) filed on site. 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.

## **FIGURE 2-2 EMERGENCY RESPONSE PROTOCOL**

The purpose of this protocol is to provide guidance for the medical management of exposure situations.

In the event of a personnel exposure to a hazardous substance or agent:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the exposed person is a TtNUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 (enter Ext. 109), or follow the voice prompt for after hours and weekend notification, and be prepared to provide:
  - Any known information about the nature of the exposure.
  - As much of the exposure history as was feasible to determine in the time allowed.
  - Name and phone number of the medical facility to which the victim(s) has/have been taken.
  - Name(s) of the exposed Tetra Tech NUS, Inc. employee(s).
  - Name and phone number of an informed site officer who will be responsible for further investigations.
  - Fax appropriate information (e.g., MSDS) to WorkCare at (714) 456-2154.
  - Contact Corporate Health and Safety Department (Matt Soltis) at 1-800-245-2730.
  - Contact Corporate Human Resources Manager (Marylin Duffy) at (412) 921-8475.

As environmental data is gathered and the exposure scenario becomes more clearly defined, this information should be forwarded to WorkCare. WorkCare will compile the results of the data and provide a summary report of the incident. A copy of this report will be placed in each victim's medical file in addition to being distributed to appropriately designated company officials. Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. This generalized summary will be accompanied by a personalized letter describing the individual's findings/results. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

**FIGURE 2-2 (continued)**  
**POTENTIAL EXPOSURE REPORT**

Name: \_\_\_\_\_ Date of Exposure: \_\_\_\_\_

Social Security No.: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Client Contact: \_\_\_\_\_ Phone No.: \_\_\_\_\_

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

**I. Exposing Agent**

Name of Product or Chemicals (if known): \_\_\_\_\_

Characteristics (if the name is not known)

Solid            Liquid            Gas            Fume            Mist            Vapor

**II. Dose Determinants**

What was individual doing? \_\_\_\_\_

How long did individual work in area before signs/symptoms developed? \_\_\_\_\_

Was protective gear being used? If yes, what was the PPE? \_\_\_\_\_

Was their skin contact? \_\_\_\_\_

Was the exposing agent inhaled? \_\_\_\_\_

Were other persons exposed? If yes, did they experience symptoms? \_\_\_\_\_

**III. Signs and Symptoms** (check off appropriate symptoms)

**Immediately With Exposure:**

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Nausea / Vomiting

Dizziness

Weakness

**Delayed Symptoms:**

Weakness

Nausea / Vomiting

Shortness of Breath

Cough

Loss of Appetite

Abdominal Pain

Headache

Numbness / Tingling

**IV. Present Status of Symptoms** (check off appropriate symptoms)

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Cyanosis

Nausea / Vomiting

Dizziness

Weakness

Loss of Appetite

Abdominal Pain

Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: \_\_\_\_\_ Worsened: \_\_\_\_\_ Remained Unchanged: \_\_\_\_\_

**V. Treatment of Symptoms** (check off appropriate response)

None: \_\_\_\_\_ Self-Medicated: \_\_\_\_\_ Physician Treated: \_\_\_\_\_

### **3.0 SITE BACKGROUND**

Work under CTO 0273 will be conducted at UST Site 0020; NAS Pensacola. Work will be conducted at this site as discussed in detail below.

#### **3.1 NAS PENSACOLA**

NAS Pensacola is approximately 5,800-acres and is located on a peninsula bounded on the east and south by Pensacola Bay and Big Lagoon, and on the north by Bayou Grande.

##### **3.1.1 UST Site 0020**

UST Site 0020 is located just outside the Fuel Farm at NAS Pensacola. The estimated amount of 360,000 gallons of JP-4 fuel is reported to have leaked in 1958. Additional contamination was discovered in the site groundwater following the installation and sampling of an additional FDEP requested groundwater monitoring well in conjunction with the preparation of the site Remedial Action Plan. The intent of the project is to perform additional fieldwork as necessary to fully characterize the petroleum contamination at the site and submit the results of the investigation in a Site Assessment Report Addendum (SARA)

## 4.0 SCOPE OF WORK

The following is a list of activities that are covered in this HASP for the CTO 0273 project:

- Mobilization/demobilization
- Soil boring activities using Direct Push Technology (DPT) and hand-augering techniques.
- Micro-Monitoring well installation and development
- Multi-media sampling, including:
  - Soil
  - Groundwater
  - Investigative-Derived Waste (IDW)
- Decontamination of sampling and heavy equipment
- IDW management

The above listing represents a summarization of the tasks as they may apply to the scope and application of this HASP. For more detailed description of the associated tasks, refer to the Sampling and Analysis Plan (SAP). Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The TOM or a designated representative will submit requested modifications to this document to the HSM.

## 5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION

Table 5-1 of this section serves as the primary portion of the site-specific HASP which identifies the tasks that are to be performed as part of the scope of work. This table will be modified and incorporated into this document as new or additional tasks are performed at the site. The anticipated hazards, recommended control measures, air monitoring recommendations, required Personal Protective Equipment (PPE), and decontamination measures for each site task are discussed in detail. This table and the associated control measures shall be changed, if the scope of work, contaminants of concern, or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task and at each site, and what associated control measures are necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on proper air monitoring techniques and site-specific conditions.

A Health and Safety Guidance Manual accompanies this table and HASP. The manual is designed to further explain supporting programs and elements for other site-specific aspects as required by 29 CFR 1910.120. The Guidance Manual should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of Tetra Tech NUS' SOPs are also provided in this Guidance Manual.

Safe Work Permits issued for the Exclusion Zone activities (See Section 9.4 and Attachment IV) will use elements defined in Table 5-1 as it's primary reference. The FOL and/or the SSO completing the Safe Work Permit will add additional site-specific information. In situations where the Safe Work Permit is more conservative than the direction provided in Table 5-1 due to the incorporation of site-specific elements, the Safe Work Permit will be followed.

TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES SUMMARY  
NAS PENSACOLA, PENSACOLA, FLORIDA

| Tasks/Operation/<br>Locations   | Anticipated Hazards  | Recommended Control Measures   | Hazard Monitoring - Type and Action Levels  | Personal Protective Equipment<br><i>(Items in italics are deemed optional as conditions or the FOL or SSO require.)</i>   | Decontamination Procedures  |
|---------------------------------|--|--|---|---|---|
| Mobilization/<br>Demobilization | <p><b>Chemical hazards:</b></p> <p>1) The on-site Hazard Communication Program (Section 5.0 of the Health and Safety Guidance Manual) will be followed. The chemicals brought onto the site by Tetra Tech NUS and subcontractor personnel will be inventoried and have an MSDS on site. This effort shall include</p> <ul style="list-style-type: none"> <li>- Accurate Chemical Inventory List (use chemical names as they appear on the MSDS). This list, which also includes quantities and storage locations, will be filed on site and provided to emergency response units when requested.</li> <li>- MSDS's will be maintained in a central location, accessible to site personnel.</li> </ul> <p>Containers will have labels specifying the following information:</p> <ul style="list-style-type: none"> <li>- Chemical Identity (As it appears on the label, MSDS, and Chemical Inventory List)</li> <li>- Appropriate Warning (i.e., Eye and skin irritation, flammable, etc.)</li> <li>- Manufacturer's Name Address and Phone Number</li> </ul> <p><b>Physical hazards:</b></p> <p>2) Lifting (strain/muscle pulls)<br/>3) Pinches and compressions/Struck by<br/>4) Slips, trips, and falls<br/>5) Heavy equipment hazards (operation based hazards, material handling, etc.)<br/>6) Vehicular and foot traffic<br/>7) Ambient temperature extremes</p> <p><b>Natural hazards:</b></p> <p>8) Insect/animal bites and stings, poisonous plants, etc.<br/>9) Inclement weather</p> | <p><b>Chemical hazards:</b></p> <p>1) Site personnel will be required to review the appropriate MSDS's, prior to the use of a specified chemical substance. This direction should also be communicated on the Safe Work Permit completed for this task.</p> <p>2) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques</p> <ul style="list-style-type: none"> <li>- Lift with your legs, not your back, bend your knees move as close to the load as possible, and ensure good hand holds are available.</li> <li>- Minimize the horizontal distance to the center of the lift to your center of gravity.</li> <li>- Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time.</li> <li>- Break lifts into steps if the vertical distance (from the start point to the placement of the lift) is excessive.</li> <li>- Plan your lifts – Place heavy items on shelves between the waist and chest; lighter items on higher shelves.</li> <li>- Periods of high frequency lifts or extended duration lifts should provide sufficient breaks to guard against fatigue and injury.</li> </ul> <p>In determining whether you can lift an item several factors must be considered, these are as follows:</p> <ul style="list-style-type: none"> <li>- Maximum weight lifted by a single person should not exceed 70 pounds. Items over 70 pounds or the amount you feel you can confidently lift up to 70 pounds should define a point where assistance in the lift is sought. Other conditions impacting when assistance should be sought include</li> <li>- Area available to maneuver the lift.</li> <li>- Area of the lift – Work place clutter, slippery surfaces</li> <li>- Overall physical condition</li> </ul> <p>3) Keep any machine guarding in place. Do not modify tooling without manufacturer's expressed permission.</p> <ul style="list-style-type: none"> <li>- Avoid moving parts.</li> <li>- Use tools or equipment where necessary to avoid contacting pinch points.</li> <li>- Adjust machine guarding as necessary to minimize distance between guards and point of operation.</li> <li>- When staging equipment, insure stacked loads, shelving, are adequately secure to avoid creating a hazard from falling objects.</li> </ul> <p>4) Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none"> <li>- Cover, guard and barricade open pits, ditches, and floor opening as necessary. The FOL and the SSO should identify these potential hazards during site surveys and site preparation.</li> </ul> <p>5) Equipment will be:</p> <ul style="list-style-type: none"> <li>- Inspected in accordance with OSHA and manufacturer's design.</li> <li>- Operated by knowledgeable operators and ground crew.</li> </ul> <p>6) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"> <li>- Establish safe zones of approach.</li> <li>- Foot and vehicular traffic routes shall be well defined</li> <li>- Secure loose articles.</li> <li>- Self-propelled equipment shall be equipped with movement warning systems.</li> <li>- Activities are to be conducted consistent with the site requirements.</li> </ul> <p>7) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat and cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual.</p> <p>8) Avoid nesting areas, use repellents, tape up pant legs to the top of work boots. In high vegetation/brush areas (knee high or greater) wear Tyvek taped to work boots. Report potential hazards to the SSO. Follow guidance presented in Section 4.0 of the Health and Safety Guidance Manual and Section 6.3 of this HASP.</p> <p>9) Suspend or terminate operations until directed otherwise by SSO (thunderstorms, high heat, etc.) Take necessary precautions for protection against the sun (See Section 6.3.4.2 of this HASP).</p> | Visual observation of work practices by the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, etc.). | <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> <li>- Standard field attire (Sleeved shirt; long pants)</li> <li>- Steel toe safety shoes</li> <li>- <i>Safety glasses</i></li> <li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li> <li>- <i>Reflective vest for high traffic areas</i></li> <li>- <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i></li> </ul> <p>Additional protective measures include:</p> <ul style="list-style-type: none"> <li>- Insect Repellent</li> <li>- Sunscreen</li> <li>- Taping bottom of pant legs to work boots</li> <li>- Tyvek coveralls taped to work boots for high brush</li> </ul> <p><b>Note:</b> Provisions addressing site specific conditions will be recorded on the Safe Work Permit and presented on-site by the FOL and/or the SSO as part of the daily briefing.</p> | Perform close body inspections for ticks and other insects when exiting high brush areas. |

TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES SUMMARY  
NAS PENSACOLA, PENSACOLA, FLORIDA

| Tasks/Operation/<br>Locations  | Anticipated Hazards  | Recommended Control Measures  | Hazard Monitoring - Type and Action Levels  | Personal Protective Equipment<br><i>(Items in italics are deemed optional as conditions or the FOL or SSO require.)</i>  | Decontamination Procedures  |
|--|--|---|---|--|---|
| <p>Groundwater sampling</p> <p>This task also includes well development of existing and newly installed ground water monitoring wells.</p> | <p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified the volatile organic compounds of benzene, ethylbenzene, toluene and xylene (BETX), methylene chloride, trichloroethylene also PAHs methyl naphthalene and naphthalene as the contaminants of concern in the soil and groundwater.</p> <p>2) Transfer of contamination into clean areas</p> <p><b>Physical hazards:</b></p> <p>3) Lifting (strain/muscle pulls)<br/>4) Pinches and compressions<br/>5) Slips, trips, and falls<br/>6) Ambient temperature extremes<br/>7) Vehicular and foot traffic<br/>8) Compressed gas cylinders</p> <p><b>Natural hazards:</b></p> <p>9) Insect/animal bites and stings, poisonous plants, etc.<br/>10) Inclement weather</p> | <p>1) Use real-time monitoring instrumentation, action levels, and identified PPE to control exposures to potentially contaminated media (air, water, soils, etc.). Generation of dusts should be minimized. If airborne dusts are observed, area wetting methods may be used. If area wetting methods are not feasible, activities must be suspended until dust levels subside, or until an acceptable alternative control method can be selected.</p> <p>2) Decontaminate equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction in this task.</p> <p>3) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (See Lifting Mobilization/Demobilization, Page 1 of 6, Table 5-1).</p> <p>4) Avoid moving parts, do not remove any machine guarding.<br/>- Use tools or equipment where necessary to avoid contacting pinch points.<br/>- A remote sampling device must be used to sample drill cuttings near rotating tools. The equipment operator shall shutdown machinery if the sampler is near moving machinery parts.<br/>- Remove any snag points<br/>- Follow Safe Work Permit and Safe Work Practices for drilling operations (See Section 5.1 &amp; 5.2)</p> <p>5) Preview work locations for unstable/uneven terrain.<br/>- Ruts, roots, and other tripping hazards should be eliminated from around the point of operation to minimize trips and falls when approaching the percussion or hydraulic tooling.<br/>- Use multiple persons and small loads to pack sampling resources to remote locations.<br/>- Construct rope ladders and other engineered assistance for traversing hills and inclines &gt; 45°.</p> <p>6) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat/cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual.</p> <p>7) Traffic and equipment considerations are to include the following:<br/>- Establish safe zones of approach (i.e. Mast or Boom + 5 feet). See Section 8.0 of the HASP for specific safety zones and established clearance recommendations.<br/>- Self-propelled equipment shall be equipped with movement warning systems.<br/>- When sampling along roadways, use signs to indicate men working as well flag persons, as necessary. Personnel working in and around any established traffic patterns should wear high visibility vests to increase visual recognition.</p> <p>8) Use safe work practices for handling compressed gas cylinders. Keep protective caps on cylinders until they are ready for use. Secure cylinders to prevent damage and potential ruptures. Ensure the connections are secure and cylinder is in a secure position before opening valves. Inspect the cylinders before use. Keep incompatible materials from oxygen source including combustible material and ignition sources.</p> <p>9) Avoid nesting areas, use repellents approved by the FOL. Report potential hazards to the SSO. Follow guidance presented in Section 4.0 of the Health and Safety Guidance Manual. Some of the investigation area is more heavily vegetated. In addition the debris pile located in the middle of the site may offer harbor to insects and animals. Based on this care should be taken when in these areas. Taping up pant legs to boots, use of repellants, and close body examinations should be employed when this hazard exists.</p> <p>10) Suspend or terminate operations until directed otherwise by the SSO.</p> | <p>A Photoionization Detector (PID) with a 11.7 eV lamp, or a Flameionization Detector (FID), will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the sample collection area will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions:</p> <p>- Monitor the breathing zone of at-risk and downwind employees. Any sustained reading above background (greater than 1 minute in duration) in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to retreat to an unaffected area.</p> <p>- Work may only resume if airborne readings in worker breathing zone return to background. If elevated readings in worker breathing zone occur more than three times through the course of a day or persists, the PHSO and HSM will be contacted to determine necessary actions and levels of protection.</p> | <p>Level D protection will be utilized for the following sampling activities.</p> <p>Level D - (Minimum Requirements)<br/>- Standard field attire (Sleeved shirt; long pants)<br/>- Steel toe safety shoes<br/>- Safety glasses<br/>- Surgical style gloves (<i>double-layered if necessary</i>)<br/>- <i>Reflective vest for high traffic areas</i><br/>- <i>Hardhat (when overhead hazards exists)</i><br/>- <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i><br/>- <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i></p> <p>Additional protective measures include:</p> <p>- Insect Repellant<br/>- Sunscreen<br/>- Taping bottom of pant legs to work boots<br/>- Tyvek coveralls taped to work boots for high brush</p> <p><b>Note:</b> The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p> | <p><b>Personnel Decontamination</b></p> <p>Personal decontamination will vary based on the type of sampling conducted. These are as follows:</p> <p>- Decontamination will be the same as prescribed for the drilling activity</p> <p>Sampling groundwater the following provisions will apply:</p> <p>- Upon completion of the sampling dedicated tubing will be bagged for transport back to the central decontamination area.</p> <p>- PPE (gloves) will be removed and also bagged for disposal.</p> <p>- Handi-Wipes or similar product will be used to clean hands prior to moving to the next location. Personnel will wash with soap and water at their earliest convenience, prior to lunch and/or breaks.</p> <p>In addition if the potential exists for ticks and other insects a close body inspection will be performed when possible and upon leaving the vegetated area.</p> <p><b>Equipment Decontamination</b></p> <p>Equipment used in remote sampling locations will be brought back to the central decontamination area for decontamination and re-use or decontamination and gross removal of contamination prior to disposal.</p> |

TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES SUMMARY  
NAS PENSACOLA, PENSACOLA, FLORIDA

| Tasks/Operation/<br>Locations   | Anticipated Hazards  | Recommended Control Measures   | Hazard Monitoring – Type and<br>Action Levels   | Personal Protective Equipment<br><i>(Items in italics are deemed optional as<br/>conditions or the FOL or SSO require.)</i>   | Decontamination Procedures  |
|---|--|--|---|---|---|
| <p>Soil boring including DPT</p> <p>This task also includes monitoring well installation.</p> | <p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified the volatile organic compounds of benzene, ethylbenzene, toluene and xylene (BETX), methylene chloride, trichloroethylene also PAHs methyl naphthalene and naphthalene as the contaminants of concern in the soil and groundwater.</p> <p>Well Construction Materials</p> <ul style="list-style-type: none"> <li>- Bentonite</li> <li>- Grout</li> <li>- Filter Sand</li> </ul> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><b>Physical hazards:</b></p> <p>3) Heavy equipment hazards (pinch/compressions points, hydraulic lines, etc.)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Lifting (strain/muscle pulls)</p> <p>7) Slips, trips, and falls</p> <p>8) Vehicular and foot traffic</p> <p>9) Ambient temperature extremes</p> <p>10) Flying projectiles</p> <p><b>Natural hazards:</b></p> <p>11) Insect/animal bites and stings, poisonous plants, etc.</p> <p>12) Inclement weather</p> | <p>1) Use real-time monitoring instrumentation, action levels, and identified PPE to control exposures to potentially contaminated media (air, water, soils, etc.). Generation of dusts should be minimized. If airborne dusts are observed, area wetting methods may be used. If area wetting methods are not feasible, activities must be suspended until dust levels subside, or until an acceptable alternative control method can be selected.</p> <p>-Verify monitoring well construction materials (grout, bentonite, sand, and decontamination solutions) MSDS are included in Hazard Communication Program.</p> <p>2) Decontaminate equipment and supplies between boreholes and prior to leaving the site. Wrap portable equipment to be transported across clean areas of the site to the central decontamination pad.</p> <p>3) Equipment will be:</p> <ul style="list-style-type: none"> <li>- Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600.601.602), and manufacturer's design. Inspections will be documented using the Equipment Inspection Checklist found in Attachment III of this HASP.</li> <li>- Operated and supported by knowledgeable operators, and ground crew.</li> <li>- Used within safe work zones, with routes of approach clearly demarcated. Personnel not directly supporting this operation will remain at least 25 feet from the point of operation. See Section 8.0 of this HASP. This will be the area identified as the exclusion zone.</li> </ul> <p>In addition to equipment considerations, the following safe operating procedures will be incorporated:</p> <ul style="list-style-type: none"> <li>- Hydraulic masts or other projecting devices shall be at least 20 feet from overhead power sources and a minimum of 3 feet from underground utilities.</li> <li>- Hand signals will be established prior to the commencement of the operation.</li> <li>- A remote sampling device must be used to sample drill cuttings near rotating tools</li> <li>- Only manufacturer-approved equipment may be used in conjunction with equipment repair procedures (e.g., flight connectors).</li> <li>- Work areas will be kept clear of clutter.</li> <li>- Secure loose articles to avoid possible entanglement during coring activities.</li> <li>- Self-propelled equipment shall be equipped with movement warning systems.</li> <li>- Personnel will be instructed in the location and operations of the emergency shut-off device(s). This device will be tested initially (and then periodically) to ensure its operational status.</li> <li>- Areas will be inspected prior to the movement of the drill rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO.</li> <li>- The drill rig, DPT and support vehicles will be moved no closer than 3 feet to unsupported side-walls of excavations and embankments.</li> </ul> <p>4) Hearing protection will be used during subsurface activities using the HSA or DPT . Boundaries will be established to limit noise hazard. Height of the mast + 5 feet or a minimum of 25 feet is normal. Excessive noise levels are being approach when you have to raise your voice to talk to someone within 2 feet of your location .</p> <p>5) Drilling activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment II and IIA (Florida specific requirements). Utility clearances will be obtained, in writing, and locations identified and marked prior to activities. Overhead utilities will also be identified.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>7) Preview work locations for unstable/uneven terrain.</p> <p>8) Use traffic-warning signs, flag persons, and high visibility vests as determined by the SSO when working in or along traffic thoroughfares.</p> <p>9) Wear appropriate clothing for weather conditions. Acceptable shelter and liquids for field crews.</p> <p>10) Wear eye protection and hard hat when the DPT rig is operating. Restrict others from the area.</p> <p>11) Avoid nesting areas, use repellents, tape up pant legs to work boots, wear Tyvek coveralls taped to work boots for high brush areas (knee high or greater). Report potential hazards to the SSO. See Section 4.0 of the Health and Safety Guidance Manual or Section 6.3 of this HASP.</p> <p>12) Suspend or terminate operations until directed otherwise by SSO.</p> | <p>A direct reading Photoionization Detector (PID) with a 11.7 eV lamp (Primary), or a Flameionization Detector (FID) , will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the sample collection area will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions:</p> <ul style="list-style-type: none"> <li>- Monitor the breathing zone of at-risk and downwind employees. Any sustained reading above background (greater than 1 minute in duration) in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to retreat to an unaffected area.</li> <li>- Work may only resume if airborne readings in worker breathing zone return to background. If elevated readings in worker breathing zone occur more than three times through the course of a day or persists, the PHSO and HSM will be contacted to determine necessary actions and levels of protection.</li> </ul> <p>Visible dusts</p> <p>Generation of dusts should be minimized to avoid inhalation of contaminated dusts and/or particulates.</p> | <p>Level D protection will be utilized for the following soil boring and well installation activities.</p> <p>For examining samples:</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> <li>- Standard field attire (Sleeved shirt; long pants)</li> <li>- Steel toe safety shoes</li> <li>- Safety glasses</li> <li>- Surgical style gloves (double-layered or a heavier neoprene or nitrile gloves)</li> <li>- <i>Reflective vest for high traffic areas</i></li> <li>- Hardhat (when overhead hazards exists)</li> <li>- <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i></li> <li>- Hearing protection for high noise areas, or as directed on an operation by operation scenario.</li> </ul> <p>For drilling:</p> <ul style="list-style-type: none"> <li>- Standard field attire including sleeved shirt and long pants</li> <li>- Steel toe safety shoes</li> <li>- Safety glasses</li> <li>- Nitrile inner gloves; Nitrile outer gloves</li> <li>- Hard hat (as prescribed above)</li> <li>- Impermeable garment or Rubber apron and sleeves for handling auger flights is acceptable due to heat stress.</li> <li>- Hearing protection for high noise areas</li> <li>- <i>Reflective vest for traffic areas</i></li> </ul> <p>Additional protective measures include:</p> <ul style="list-style-type: none"> <li>- Insect Repellent</li> <li>- Sunscreen</li> <li>- Taping bottom of pant legs to work boots</li> <li>- Tyvek coveralls taped to work boots for high brush</li> </ul> <p>Note: The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task. Protective levels may require modification should this activity be required to be conducted within a controlled zone due to an on-going operation.</p> | <p><b>Personnel Decontamination</b> will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). This decontamination function may be subdivided into two locations.</p> <p>Gross contamination of outer boots and outer gloves will be removed at a satellite location near the operation.</p> <p>Final wash and rinse will take place at the centralized decontamination pad.</p> <p>The sequential procedure is as follows:</p> <p>Stage 1: Equipment drop, remove outer protective wrapping; Decon personnel will wipe down the outer shell and pass hand equipment through as necessary.</p> <p>Stage 2: Soap/water wash and rinse of outer boots and gloves</p> <p>Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands</p> <p>When the potential exists for infestation by ticks and other insects, close body inspections shall be performed for the purpose of detection.</p> <p><b>Equipment Decontamination</b> - Heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. Site vehicles will have restricted access to exclusion zones, and have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity.</p> <p><b>Sampling Equipment Decontamination</b></p> <p>Sampling equipment will be decontaminated as per the requirements in the Sampling and Analysis Plan and/or Work Plan.</p> <p>Equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p> |

TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES SUMMARY  
NAS PENSACOLA, PENSACOLA, FLORIDA

| Tasks/Operation/<br>Locations                         | Anticipated Hazards  | Recommended Control Measures  | Hazard Monitoring - Type and<br>Action Levels   | Personal Protective Equipment<br><i>(Items in italics are deemed optional as conditions<br/>or the FOL or SSO require.)</i>   | Decontamination Procedures   |
|---|--|---|---|---|--|
| Decontamination of<br>Sampling and<br>Heavy Equipment | <p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified the volatile organic compounds of benzene, ethylbenzene, toluene and xylene (BETX), methylene chloride, trichloroethylene also PAHs, methylnaphthaline and naphthalene as the contaminants of concern in the soil and groundwater.</p> <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p><b>Physical hazards:</b></p> <p>3) Lifting (strain/muscle pulls)<br/>4) Noise in excess of 85 dBA<br/>5) Flying projectiles<br/>6) Slips, trips, and falls</p> <p><b>Natural hazards:</b></p> <p>7) Inclement weather</p> | <p>1) and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Obtain manufacturer's MSDS for any decontamination fluids used on-site. Solvents may only be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS or within this HASP. The chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication Program (See Section 5.0 of the Health and Safety Guidance Manual).</p> <p>- Use isopropanol only in well ventilated areas or outdoors</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment, such as auger flights for decontamination purposes.</p> <p>- Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization.</p> <p>4) Wear hearing protection when operating the Steam Cleaner or pressure washer. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the steam cleaner or pressure washer, due to flying projectiles. Other personnel must be restricted from the area. In addition to minimize hazards (flying projectiles, water lacerations and burns) associated with this operation, the following controls will be implemented</p> <p>- A 25° Fan Tip will be used on pressurized systems over 3,000 psi. This will reduce the possibility of lacerations.</p> <p>- Thermostat control to regulate the temperature levels.</p> <p>- Visual evaluations of hoses and fittings for structural defects</p> <p>- Construct deflection screens as necessary to control overspray and to guard against dispersion of contaminants driven off by the spray.</p> <p>6) The decontamination pad should be constructed to contain wash waters generated during decontamination procedures. Temporary decontamination pads are usually 10-30 mil polyethylene or polyvinyl chloride tarp construction. Although these items when used as a liner offer containment, they also present a slipping hazard. When these temporary liners are employed, it is recommended that a light coating of sand be spread over the walking surface to provide traction.</p> <p>- In addition, adequate slope should be provided to the pad to permit drainage away from the object being cleaned. The collection point for wash waters should be of adequate distance that the decon workers do not have to walk through the wash waters while completing their tasks.</p> <p>- Hoses should be gathered when not in use to eliminate potential tripping hazards.</p> <p>7) Suspend or terminate operations until directed otherwise by SSO.</p> | <p>Use visual observation and real-time monitoring instrumentation to ensure that equipment has been properly cleaned of contamination and dried.</p> <p>After decontamination is completed and parts are visually clean and dry</p> <p>- Screen equipment with a PID. If any elevated readings (i.e., above background) are observed, perform rinse process again and re-screen. Repeat until no elevated PID readings are noted. This ensures the removal of site contaminants as well as the removal of decontamination solvents to prevent cross contamination.</p> | <p><b>For heavy equipment</b><br/>This applies to steam cleaning and pressure washing operations and soap/water wash and rinse procedures.</p> <p>Level D Minimum requirements:<br/>- Standard field attire (Sleeved shirt; long pants)<br/>- Safety shoes (Steel toe/shank)<br/>- Chemical resistant boot covers<br/>- Nitrile gloves<br/>- Safety glasses underneath a splash shield<br/>- Hearing protection (plugs or muffs)<br/>- <i>Hooded PVC Rainsuits or PE or PVC coated Tyvek</i></p> <p><b>For sampling equipment</b> (trowels, Macro-Core Samplers, bailers, etc.), the following PPE is required</p> <p>Consult MSDS for PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements -<br/>- Standard field attire (Long sleeve shirt; long pants)<br/>- Safety shoes (Steel toe/shank)<br/>- Nitrile outer gloves over nitrile inner gloves<br/>- Safety glasses<br/>- <i>Rubber Apron</i></p> <p>In the event of overspray of chemical decontamination fluids, employ PVC Rainsuits or PE or PVC coated Tyvek as necessary.</p> <p>Note: The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p> | <p><b>Personnel Decontamination</b> will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). This decontamination function may be subdivided into two locations.</p> <p>Gross contamination of outer boots and outer gloves will be removed at a satellite location near the operation.</p> <p>Final wash and rinse will take place at the centralized decontamination pad.</p> <p>The sequential procedure is as follows:<br/>Stage 1: Equipment drop, remove outer protective wrapping; Decon personnel will wipe down the outer shell and pass hand equipment through as necessary.<br/>Stage 2: Soap/water wash and rinse of outer boots and gloves<br/>Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable<br/>Stage 4: Disposable PPE will be removed and bagged.<br/>Stage 5: Wash face and hands</p> <p><b>Equipment Decontamination</b> - Heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. Site vehicles will have restricted access to exclusion zones, and have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p><b>Sampling Equipment Decontamination</b></p> <p>Sampling equipment will be decontaminated as per the requirements in the Sampling and Analysis Plan and/or Work Plan.</p> <p>Equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p> |

TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES SUMMARY  
NAS PENSACOLA, PENSACOLA, FLORIDA

| Tasks/Operation/<br>Locations | Anticipated Hazards   | Recommended Control Measures  | Hazard Monitoring - Type and<br>Action Levels   | Personal Protective Equipment<br><i>(Items in italics are deemed optional as conditions<br/>or the FOL or SSO dictate.)</i>  | Decontamination Procedures   |
|-------------------------------|---|---|---|--|--|
| Surveying –<br>Geographical   | <p><b>Chemical hazards:</b></p> <p>Significant exposure to site contaminants is anticipated to be unlikely given the nature of this task.</p> <p><b>Physical hazards:</b></p> <p>1) Slips, trips, and falls</p> <p>2) Ambient temperature extremes</p> <p><b>Natural hazards:</b></p> <p>3) Inclement weather</p> <p>4) Insect/animal bites or stings, poisonous plants, etc.</p> | <p>1) Preview work locations and site lines for uneven and unstable terrain. Clear necessary vegetation, establish temporary means for traversing hazardous terrain (i.e., rope ladders, etc.)</p> <p>2) Wear appropriate clothing for weather conditions. Acceptable shelter and liquids for field crews.</p> <p>3) Suspend or terminate operations until directed otherwise by SSO</p> <p>4) Avoid nesting areas, use repellents, tape up pant legs to work boots, wear Tyvek coveralls taped to work boots for high brush areas (knee high or greater). Report potential hazards to the SSO. See Section 4.0 of the Health and Safety Guidance Manual or Section 6.3 of this HASP.</p> | <p>The potential for exposure to site contaminants during this activity is considered minimal. As most of this activity is conducted either before or after the intrusive aspect of this operation, therefore, minimizing potential exposure. Air monitoring will not be performed in this situation.</p> | <p>Surveying activities shall be performed in Level D protection</p> <p>Level D Protection consists of the following:</p> <ul style="list-style-type: none"> <li>- Standard field dress including sleeved shirt and long pants</li> <li>- Safety shoes (Steel toe/shank)</li> <li>- <i>Safety glasses, hard hats (if working near machinery)</i></li> <li>- <i>Snake chaps for heavily wooded area where encounters are likely.</i></li> <li>- <i>Tyvek coveralls may be worn to provide additional protection against poisonous plants and insects, particularly ticks. Work gloves may be worn if desired.</i></li> </ul> <p>Additional protective measures include:</p> <ul style="list-style-type: none"> <li>- Insect Repellant</li> <li>- Sunscreen</li> <li>- Taping bottom of pant legs to work boots</li> <li>- Tyvek coveralls taped to work boots for high brush</li> </ul> <p><b>Note:</b> The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task. Protective levels may require modification should this activity be required to be conducted within a controlled zone due to an on-going operation.</p> | <p><b>Personnel Decontamination</b> - A structured decontamination is not required as the likelihood of encountering contaminated media is considered remote. However, survey parties should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to stop the transfer of these insects into vehicles, homes, and offices.</p> |

## 6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards associated with the sites to be investigated and the activities that are to be conducted as part of the scope of work. Table 6-1, which is included as part of this HASP, provides various information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data. Section 6.1 provides general information regarding the contaminants that may be present at the sites.

### 6.1 CHEMICAL HAZARDS

The potential health hazards associated with work to be conducted at NAS Pensacola include inhalation, ingestion, and dermal contact of various contaminants that may be present in shallow and deep soils and groundwater. Based on the site histories and prior sampling efforts, the types of contaminants anticipated include petroleum products and associated compounds. The following have been identified as the primary classes of these contaminants, including the specific compound(s) of interest:

- Volatile Organic Compounds (VOCs), specifically benzene, ethylbenzene, toluene, xylene (BETX), methylene chloride, and trichloroethene.
- Polycyclic Aromatic Hydrocarbons (PACs), specifically 1-Methylnaphthalene, 2-Methylnaphthalene and Naphthalene.

Table 6-1 provides information on the compounds and individual substances likely to be present at the sites to be investigated. Included is information on the toxicological, chemical, and physical properties of these substances. It is anticipated that the greatest potential for exposure to site contaminants is during intrusive activities (drilling, soil sampling, etc.). Exposure to these compounds is most likely to occur through ingestion and inhalation of contaminated soil or water, or hand-to-mouth contact during soil disturbance activities. For this reason, PPE and basic hygiene practices (washing face and hands before leaving site) will be extremely important. Inhalation exposure will be avoided by using appropriate PPE and engineering controls where necessary. Significant exposure via inhalation is not anticipated during the planned scope of work.

**TABLE 6-1  
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA  
NAS PENSACOLA, FLORIDA**

| Substance    | CAS No.  | Air Monitoring/Sampling Information   |  | Exposure Limits   | Warning Property Rating   | Physical Properties  | Health Hazard Information   |
|--------------|----------|---|--|---|---|--|---|
| Benzene      | 71-43-2  | PID: I.P 9.24 eV, 100% response with PID and 10.2 eV lamp.<br><br>FID: 150% relative response ratio with FID. | Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol in accordance with OSHA 07 or NIOSH Method #1500.  | OSHA:<br>1 ppm<br><br>ACGIH:<br>10 ppm<br><br>NIOSH:<br>0.1 ppm<br><br>IDLH:<br>500 ppm           | Inadequate - Odor threshold 34-199 ppm. OSHA accepts the use of air-purifying respirators with organic vapor cartridge up to 10 ppm despite the inadequate warning properties providing cartridges are changed at the beginning of each shift.<br><br>Recommended gloves:<br>Butyl/neoprene blend - >8.00 hrs; Silver shield as a liner - >8.00 hrs;<br>Viton - >8.00 hrs | <b>Boiling Pt:</b> 176°F; 80°C<br><b>Melting Pt:</b> 42°F; 5.5°C<br><b>Solubility:</b> 0.07%<br><b>Flash Pt:</b> 12°F; -11°C<br><b>LEL/LFL:</b> 1.3%<br><b>UEL/UFL:</b> 7.9%<br><b>Vapor Density:</b> 2.77<br><b>Vapor Pressure:</b> 75 mmHg<br><b>Specific Gravity:</b> 0.88<br><b>Incompatibilities:</b> Strong oxidizers, fluorides, perchlorates, and acids<br><b>Appearance and Odor:</b><br>Colorless to a light yellow liquid with an aromatic odor | Overexposure may result in irritation to the eyes, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea. Long duration exposures may result in respiratory collapse. Regulated as an OSHA carcinogen. May cause damage to the blood forming organs and may cause a form of cancer called leukemia. |
| Ethylbenzene | 100-41-4 | PID: I.P 8.76, High response with PID and 10.2 eV lamp.<br><br>FID: 100% response with FID.                   | Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #07 or NIOSH Method #1501 Aromatic Hydrocarbon. | ACGIH & NIOSH:<br>100 ppm;<br><br>STEL<br>125 ppm<br><br>OSHA:<br>100 ppm<br><br>IDLH:<br>800 ppm | Adequate - Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm.<br><br>Recommended gloves:<br>Neoprene or nitrile w/ silver shield when potential for saturation; Teflon >3.00 hrs  | <b>Boiling Pt:</b> 277°F; 136°C<br><b>Melting Pt:</b> -139°F; -95°C<br><b>Solubility:</b> 0.01%<br><b>Flash Pt:</b> 55°F; 13°C<br><b>LEL/LFL:</b> 1.0%<br><b>UEL/UFL:</b> 6.7%<br><b>Vapor Density:</b> 3.66<br><b>Vapor Pressure:</b> 10 mmHg @ 79° F; 26°C<br><b>Specific Gravity:</b> 0.87<br><b>Incompatibilities:</b> Strong oxidizers<br><b>Appearance and odor:</b><br>Colorless liquid with an aromatic odor. Odor Threshold of 0.092-0.60.        | Regulated primarily because of its potential to irritate the eyes and respiratory system. In addition, effects of overexposure may include headaches, narcotic effects, CNS changes (i.e., coordination impairment, impaired reflexes, tremoring) difficulty in breathing, possible chemical pneumonia, and potentially respiratory failure or coma.  |

**TABLE 6-1  
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA  
NAS PENSACOLA, FLORIDA**

| Substance                          | CAS No.   | Air Monitoring/Sampling Information   |   | Exposure Limits   | Warning Property Rating   | Physical Properties  | Health Hazard Information   |
|------------------------------------|-----------|---|---|---|---|--|---|
| Toluene                            | 108-88-3  | PID: I.P. 8.82 eV, High response with PID and 10.2 eV lamp.<br><br>FID: 110% response with FID. | Air sample using charcoal tube; carbon disulfide desorption. Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1500.          | OSHA:<br>200 ppm<br>Ceiling<br>300 ppm<br><br>ACGIH:<br>50 ppm (skin)<br><br>NIOSH:<br>100 ppm<br><br>STEL<br>150 ppm<br><br>IDLH:<br>500 ppm | Adequate - Odor threshold 1.6 ppm is considered good. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm.<br><br>Recommended gloves: Teflon >15.00 hrs; Viton >16.00 hrs; silver shield >6,00 hrs; supported nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection); PV alcohol >25.00 hrs       | <b>Boiling Pt:</b> 232°F; 111°C<br><b>Melting Pt:</b> -139°F; -95°C<br><b>Solubility:</b> 0.05% (61°F;16°C)<br><b>Flash Pt:</b> 40°F; 4°C<br><b>LEL/LFL:</b> 1.2%<br><b>UEL/UFL:</b> 7.1%<br><b>Vapor Density:</b> 3.14<br><b>Vapor Pressure:</b> 20 mmHg @ 65°F; 18°C<br><b>Specific Gravity:</b> 0.87<br><b>Incompatibilities:</b> Strong oxidizers<br><b>Appearance and odor:</b> Colorless liquid with a sweet pungent aromatic odor.                                  | Overexposure to this substance may result in mild to moderate irritation at all points of contact, and CNS changes including euphoria, confusion, nervousness, and possibly paresthesia characterized by an abnormal burning sensation, pricking, or numbness. At 200-500 ppm exposure has resulted in headaches, nausea, eye irritation, loss of appetite, bad taste, impair coordination, fatigue, and weariness. Chronically, toluene overexposure may result in dermatitis, liver, and kidney damage. |
| Xylene<br>All isomers<br>o-,m-, p- | 1330-20-7 | PID: I.P. 8.56 eV, High response with PID and 10.2 eV lamp.<br><br>FID: 110% response with FID. | Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA 07, or NIOSH Method 1500. | OSHA:<br>100 ppm<br><br>ACGIH, &<br>NIOSH:<br>100 ppm,<br><br>STEL<br>150 ppm<br><br>IDLH:<br>900 ppm   | Adequate - Odor thresholds for the following isomers: 0.6 m-; 5.4 p-; 20 o- ppm. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations.<br><br>Recommended gloves:<br>PV Alcohol >12.67 hrs; Viton >8.00 hrs; CPE >1.00 hr; Butyl 0.87 hrs; Nitrile is acceptable for limited operations and contact (>0.20 hrs) | <b>Boiling Pt:</b> 269-281°F; 132-138°C<br><b>Melting Pt:</b> -13o/-54m/56p°F; -25o/-48m/13p °C<br><b>Solubility:</b> 0.02 %<br><b>Flash Pt:</b> 81-90°F;27-32°C<br><b>LEL/LFL:</b> 0.9%<br><b>UEL/UFL:</b> 7.0%<br><b>Vapor Density:</b> 3.66<br><b>Vapor Pressure:</b> 7-9 mmHg @ 70°F; 21°C<br><b>Specific Gravity:</b> 0.86-0.88<br><b>Incompatibilities:</b> Strong oxidizers and strong acids<br><b>Appearance and odor:</b> Colorless liquid with an aromatic odor. | Effects may of overexposure include irritation at the points of contact, CNS changes (i.e. dizziness, excitement, drowsiness, incoherent, staggering gait), difficulty in breathing, pulmonary edema, and possibly respiratory failure.<br><br>Chronic effects may include dermatitis and cornea vacuolization.   |

**TABLE 6-1  
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA  
NAS PENSACOLA, FLORIDA**

| Substance          | CAS No. | Air Monitoring/Sampling Information  |   | Exposure Limits  | Warning Property Rating   | Physical Properties   | Health Hazard Information  |
|--------------------|---------|--|---|--|---|---|--|
| Methylene chloride | 75-09-2 | PID: I.P. 11.32 eV, High response with PID and 11.7 eV lamp.<br><br>FID: 100% response with FID. | Air sample using charcoal or Anasorb CMS sorbent tube; carbon disulfide desorption; gas chromatography-flame ionization detector; Sampling and analytical protocol shall proceed in accordance with OSHA Method #59, 80, or NIOSH Method #1005. | OSHA: 50 ppm, 100 ppm (Ceiling)<br><br>ACGIH: 50 ppm<br><br>NIOSH: Lowest feasible concentration<br><br>IDLH: 2300 ppm | Inadequate - Odor threshold 160 ppm. Use a gas mask with a Type N canister for concentrations up to 25 ppm. In excess of 25 ppm, use a supplied air respirator (airline respirator with emergency escape cylinder or a Self-Contained Breathing Apparatus - (SCBA).<br><br><b>Recommended gloves:</b> Nitrile rubber latex glove 3.00 hrs (vendor specific); supported Polyvinyl alcohol glove, unsupported 1-8 hrs; Silver shield 1.90 hrs         | <b>Boiling Pt:</b> 104°F; 39.8°C<br><b>Melting Pt:</b> -141°F; -96°C<br><b>Solubility:</b> 2%<br><b>Flash Pt:</b> Not available<br><b>LEL/LFL:</b> 13%<br><b>UEL/UFL:</b> 12%<br><b>Vapor Density:</b> 2.93<br><b>Vapor Pressure:</b> 380 mmHg @ 72°F; 22° C<br><b>Specific Gravity:</b> 1.33<br><b>Incompatibilities:</b> Strong oxidizers, caustics, metals (i.e. aluminum, magnesium, potassium, sodium, lithium), and concentrated acids<br><b>Appearance and Odor:</b> Colorless liquid with a chloroform-like odor. (Note: A gas above 104°F; 40°C).  | Effects of overexposure may include CNS effects - cause sleepiness, fatigue, weakness, lightheadedness, numbness of the limbs, altered cardiac rate and incoordination. These signs and symptoms may be accompanied by nausea, gastric and pulmonary irritation leading possibly to pulmonary edema. In addition to the narcosis long term effects may include liver injury. Listed as possessing carcinogenic properties by NTP, IARC, and ACGIH. |
| Trichloroethylene  | 79-01-6 | PID: I.P. 9.45 eV, High response with PID and 10.2 eV lamp.<br><br>FID: 70% Response with FID.   | Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1022 or #1003.   | OSHA: 50 ppm 200 ppm (Ceiling)<br><br>ACGIH: 50 ppm 100 ppm STEL<br><br>NIOSH: 25 ppm<br><br>IDLH: 1000 ppm            | Inadequate - Odor threshold 82 ppm. APRs with organic vapor/acid gas cartridges may be used for escape purposes. Exceedances over the exposure limits require the use of positive pressure-demand supplied air respirator.<br><br><b>Recommended gloves:</b> PV Alcohol unsupported >16.00 hrs; Silver shield >6.00 hrs; Teflon >24.00 hrs; or Viton >24.00 hrs; Nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection) | <b>Boiling Pt:</b> 188°F; 86.7°C<br><b>Melting Pt:</b> -99°F; -73°C<br><b>Solubility:</b> 0.1% @ 77°F; 25°C<br><b>Flash Pt:</b> 90°F; 32°C<br><b>LEL/LFL:</b> 8% @ 77°F; 25°C<br><b>UEL/UFL:</b> 10.5 @ 77°F; 25°C<br><b>Vapor Density:</b> 4.53<br><b>Vapor Pressure:</b> 100 mmHg @ 90°F; 32° C<br><b>Specific Gravity:</b> 1.46<br><b>Incompatibilities:</b> Strong caustics and alkalis, chemically active metals ( barium, lithium, sodium, magnesium, titanium, and beryllium)<br><b>Appearance and Odor:</b> Colorless liquid with a chloroform type odor. Combustible liquid, however, burns with difficulty. | Central nervous system effects including euphoria, analgesia, anesthesia, paresthesia, headaches, tremors, vertigo, and somnolence. Damage to the liver, kidneys, heart, lungs, and skin have also been reported. Contact may result in irritation to the eyes, skin, and mucous membranes. Ingestion may result in GI disturbances including nausea, and vomiting NIOSH lists this substance a potential human carcinogen.                        |

**TABLE 6-1  
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA  
NAS PENSACOLA, FLORIDA**

| Substance         | CAS No.                                   | Air Monitoring/Sampling Information   |   | Exposure Limits  | Warning Property Rating   | Physical Properties  | Health Hazard Information   |
|-------------------|---|---|---|--|---|--|---|
| Methylnaphthalene | 90-12-0 (1-)<br>91-57-6 (2-)<br>1321-94-4 | There is no information available regarding this substance. It is assumed that this substance based on its characteristics is detectable using an FID however, relative response ratio was not available. | Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection; Sampling and analytical protocol in accordance with OSHA 07 or NIOSH Method #1501.         | None established for this compound. However, it is recommended that 0.2 mg/m <sup>3</sup> for coal tar pitch volatiles be employed where excessive concentrations may exist. This is more relevant for those PAHs considered carcinogenic. | Information regarding this substance was limited. This material is a natural constituent of coal tar.<br><br>Adequate - Odor threshold 0.012-0.023 mg/m <sup>3</sup> . OSHA accepts the use of air-purifying respirators with organic vapor cartridge/HEPA filter up to 10 ppm, providing cartridges are changed at the beginning of each shift.<br><br><b>Recommended gloves:</b> Butyl - >8.00 hrs; are recommended for other coal tar pitch associated substances; Neoprene >4.00 hrs; Nitrile >1.00 hrs | <b>Boiling Pt:</b> 434-507°F; 241-264°C<br><b>Melting Pt:</b> -8°F(1-),94°F (2-); -22°C (1-), 35°C (2-)<br><b>Solubility:</b> Insoluble in water<br><b>Flash Pt:</b> Not available<br><b>LEL/LFL:</b> Not available<br><b>UEL/UFL:</b> Not available<br><b>Density:</b> 1.0058 (Beta isomer); 1.02 (alpha isomer)<br><b>Vapor Density:</b> 4.91 (1-)<br><b>Vapor Pressure:</b> 180-260 mmHg<br><b>Specific Gravity:</b> 0.994 (2-); 1.025(1-)<br><b>Incompatibilities:</b> Strong oxidizers, alkalis, and acids.<br><b>Appearance and Odor:</b> Colorless liquid (alpha isomer) with an acrid odor. The Beta isomer is a solid with slight odor. | Overexposure to this substance has shown to be a skin, eye, and mucous membrane irritant. This substance is not considered a photosensitizer. This substance is considered mildly to moderately toxic by ingestion.   |
| Naphthalene       | 91-20-3                                   | PID: I.P. 8.12 eV, relative response ratio unknown.<br><br>No information was found as to the relative response for FID, however it is certain it is detectable at a high response.                       | Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #35 or NIOSH Method #1501. | OSHA; NIOSH; ACGIH: 10 ppm<br><br>NIOSH; ACGIH: have established a STEL of 15 ppm.<br><br>IDLH: 250 ppm  | Odor Threshold 0.038 ppm, Adequate - Use an air purifying respirator with organic vapors and dust/mists cartridges for concentrations up to 250 ppm.<br><br><b>Recommended glove:</b> Nitrile >6.00 hrs; Neoprene >6.00 hrs   | <b>Boiling Pt:</b> 424°F; 218°C<br><b>Melting Pt:</b> 176°F; 80°C<br><b>Solubility:</b> 0.003%<br><b>Flash Pt:</b> 174°F; 79°C<br><b>LEL/LFL:</b> 0.9%<br><b>UEL/UFL:</b> 5.9%<br><b>Vapor Density:</b> Not available<br><b>Vapor Pressure:</b> 1 mmHg<br><b>Specific Gravity:</b> 1.15<br><b>Incompatibilities:</b> Strong oxidizers, chromic anhydride<br><b>Appearance and odor:</b> Colorless to brown solid with and odor of mothballs  | Overexposure to this substance may result in irritation to the eyes, headache, confusion, excitement, nausea, vomiting, abdominal pain, irritation of the bladder, profuse sweating, jaundice, blood in the urine, renal (kidney shutdown), and dermatitis. Prolonged or chronic exposure may further cause optical neuritis, and corneal damage. Target organs are listed as eyes, blood, liver, kidneys, skin, red blood cells, and central nervous system. |

## 6.2 PHYSICAL HAZARDS

In addition to the chemical hazards discussed above, the following physical hazards may be present during the performance of the site activities.

- Heavy equipment hazards (pinch/compression points, rotating equipment, etc.).
- Slips, trips, and falls
- Energized systems (contact with underground or overhead utilities)
- Lifting (strain/muscle pulls)
- Noise in excess of 85 decibels (dBA)
- Flying projectiles
- Ambient temperature extremes (heat stress)
- Pinches and compressions
- Vehicular and foot traffic

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, many of these hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Specific discussions on some of these hazards are presented below.

### 6.2.1 Heavy Equipment Hazards (Pinch/compression points, rotating equipment, etc.)

Often the hazards associated with drilling operations are the most dangerous to be encountered during site activities. The SSO will discuss safe drilling procedures as part of site-specific training and/or during daily safety meetings using Safe Work Permits (Figure 9-1) presented in this HASP. The following rules will apply to drilling operations:

- Site personnel will be aware of the location and operation of this equipment.
- Each drill rig must be equipped with emergency stop devices which will be tested daily to ensure that they are operational.
- Long handled shovels or equivalent shall be used to clear cuttings from the borehole and rotating equipment.

Additional requirements during drilling activities are discussed in Table 5-1. The SSO will thoroughly discuss safe drilling procedures during the pre-activities training session. Site personnel will sign the form in Figure 8-2 documenting that they received the training and understand the procedures.

### **6.2.2 Energized Systems (Contact with Underground or Overhead Utilities)**

Underground utilities such as pressurized lines, water lines, telephone lines, buried utility lines, and high voltage power lines may be present throughout the facility. **Therefore, subsurface activities must be conducted following the requirements of the Tetra Tech NUS SOP for “Utility Locating and Excavation Clearance (HS-1.0)”**. A copy of this SOP is provided as Attachment II. Clearance of underground and overhead utilities for each sample location will be coordinated with NAS Pensacola personnel. Greg Campbell is the point-of-contact for NAS Pensacola and can be reached at (850) 452-4611. Additionally, drilling operations will be conducted at a safe distance from overhead power lines as discussed in Attachment II. In certain cases, NAS Pensacola personnel may need to de-energize electrical cables using facility lockout/tagout procedures to insure electrical hazards are eliminated.

### **6.2.3 Ambient Temperature Extremes**

Overexposure to high ambient temperatures may exist during performance of this work depending on the project schedule. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, workload and level of protective equipment will affect the degree of exposure. Site personnel will be encouraged to drink plenty of fluids to replace those lost through perspiration. Additional information such as Work-Rest Regimens and personnel monitoring may be found in Health and Safety Guidance Manual. The SSO will recommend additional heat stress control measures as they are deemed necessary as per ACGIH guidelines.

## **6.3 NATURAL HAZARDS**

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. In general, avoidance of areas of known infestation or growth will be the preferred exposure control for insects/animals and poisonous plants. Specific discussion on principle hazards of concern follows:

Various insects and animals may be present and should be considered.

### **Fire Ants**

Fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched. Allergic

reactions of people sensitive to the venom include dizziness, swelling, shock and in extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed they defend it by swarming out and over the mound, even running up grass blades and sticks.

Also, areas to be investigated could be prime nesting and/or hiding locations for snakes and other insects. Personnel should avoid reaching into areas that are not visibly clear of snakes or insects. Snake chaps will be worn in areas of known or anticipated snake infestation. All site 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 and the FOL and SSO notified.

### **Ticks**

There are various areas throughout the U.S. where Lyme Disease is endemic. Fortunately, Florida is not one of these areas. Nonetheless, personnel should be aware of the hazards of tick bites and Lyme Disease. The longer an affected tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots). As well as performing frequent body checks will 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 Health and Safety Guidance Manual.

### **Mosquitoes**

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Fish and Wildlife Conservation Commission and Florida Department of Health Bureau of Epidemiology monitors mosquitoes in the state and takes actions to control their populations. There have been nine reported cases of West Nile Virus (WNV) in Florida. Escambia County is one of the Florida Counties under a Medical Alert from the Florida Department of Health for WNV.

West Nile Virus - Encephalitis caused by WNV is transmitted to humans by mosquitoes. Mosquitoes become infected when feeding on birds infected with the WNV. Infected mosquitoes then transmit the WNV to humans and animals when biting (or taking a blood meal). WNV encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid barehanded contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus.

Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of WNV encephalitis is usually 3 to 12 days. There is no specific therapy or vaccine against WNV encephalitis. The Florida Department of Health has tracked nine human encephalitis cases caused by the WNV.

**Eastern Equine Encephalitis** - Eastern Equine Encephalitis (EEE) virus circulates in nature primarily in a bird-mosquito cycle with man, horses and exotic game birds (Pheasants and Chukar partridges) as dead end hosts. The virus appears to be confined primarily to states along the Atlantic and Gulf coasts causing clinical cases in unvaccinated equines every summer. Epidemics in humans are quite rare; occurring only four times in the past 62 years in Massachusetts, Louisiana and New Jersey. The virus is usually circulated throughout the year in fresh-water swamps by mosquitoes that prefer feeding on wild birds. An incubation period of 3 to 7 days is usually followed by acute onset of fever, headache, stiff neck, disorientation, and lethargy, convulsions, and other signs of encephalitis sometimes followed by coma and death.

**Precautions** - The following precautions should be observed when working out doors.

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Apply insect repellent according to manufacturers instruction to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin or DEET, mosquitoes may bite through thin clothing.

## **Snakes**

Areas to be investigated on this project could be prime nesting and/or hiding locations for snakes. Personnel should avoid reaching into areas that are not visibly clear of snakes or insects. Snake chaps will be worn in areas of known or anticipated snake infestation. Although 45 species of snakes are found in Florida, only the 6 are poisonous and a danger to humans. If you find a snake and you do not know whether or not it is poisonous, the safest thing to do is leave it alone. Florida snakes are not aggressive and, unless they are cornered, most will flee when humans approach. Occasionally, you might encounter one that is reluctant to leave because it is basking in the sun to get warm. Among snakebite victims, an unacceptably high number are bitten on the hands and arms when they are handling the snake. Do not catch a snake and

do not handle one unless you are sure it is not poisonous. In addition, for a short time after a snake is killed, its reflexes may continue to work. Those reflexes typically cause the body to writhe slowly for awhile, but they can cause a convulsive contraction and a bite, so you should not handle a freshly killed venomous snake.

**Copperhead** - Average adult size is 22-36 inches (56-91 cm), record is 53 inches (135 cm). It is a stout-bodied snake with broad, light brown to gray cross bands, alternating with dark brown to reddish-brown cross bands. Constrictions along the backbone give the dark bands an hourglass shape. On the sides of the body the dark bands usually have light centers, and occasionally one dark spot. Southern copperheads sometimes have an overall pinkish tint. The top of head in front of the eyes is covered with large plate-like scales. The pupil is elliptical, a catlike vertical slit. There is a deep facial pit between the nostril and the eye. The preferred habitat is low, wet areas around swamps, streambeds, river bottoms, and damp ravines, but it also occurs on the hillsides above the wet areas. It also is found in suburban neighborhoods near people. Copperhead bites are extremely painful but usually are not life-threatening for healthy adults. As with poisonous snakebites, the victim should seek immediate medical care from a physician or hospital experienced in treating snakebite

**Cottonmouth** - Average adult size is 20-48 inches (51-121 cm), record is 74.5 inches (189 cm) and is a dark-colored, heavy-bodied snake. Juveniles are brightly colored with reddish-brown cross bands on a brown ground color. The dark cross bands contain many dark spots and speckles. The pattern darkens with age so adults retain only a hint of the former banding or are a uniform black. The eye is camouflaged by a broad, dark, facial stripe. The head is thick and distinctly broader than the neck, and when viewed from above, the eyes cannot be seen. The top of head in front of the eyes is covered with large plate-like scales. The pupil is vertical (catlike). There is a deep facial pit between the nostril and the eye. Its habitat is any wetlands or waterway in the state. Cottonmouths can be found along streams, springs, rivers, lakes, ponds, marshes, swamps, sloughs, reservoirs, retention pools, canals, and roadside ditches. It occasionally wanders far from water, and has been found in bushes and trees. Cottonmouth bites can be quite dangerous. The victim should seek immediate medical care from a physician or hospital experienced in treating snakebite.

**Eastern Diamondback Rattlesnake** - Average adult size is 36-72 inches (91-183 cm), record is 96 inches (244 cm). It is a large, heavy-bodied snake with a row of large dark diamonds with brown centers and cream borders down its back. The ground color of the body is brownish. The tail ends in a rattle. The tail is usually a different shade, brownish or gray, and toward the end of the tail the diamonds fade out or break into bands. The large and thick head has a light bordered dark stripe running diagonally through the eye and there are vertical light stripes on the snout. The pupil is vertical (catlike) and there is a deep

facial pit between the nostril and the eye. Diamondbacks are often found in pine flat woods, longleaf pine and turkey oak, and sand pine scrub areas. These habitats contain palmetto thickets and gopher tortoise burrows in which the Diamondback may seek refuge. This is a large and potentially dangerous snake. It can strike up to 2/3 its body length; a 6-foot (183 cm) specimen may strike 4 feet (122 cm).

**Timber Rattlesnake** - Average adult size is 36-60 inches (76-152 cm), record is 74.5 inches (189 cm). Can be a large, heavy-bodied snake. The reddish brown stripe running down the center of the back is disrupted by a series of large, black, chevron-like cross bands on the pinkish gray or tan body. The tail is uniform black. The head is large and sometimes with a dark diagonal line through the eye or just behind the eye. The pupil is vertical (catlike) and there is a facial pit between the nostril and the eye. The tail ends in a rattle. Timber rattlesnakes in Florida prefer low bottomlands where it is fairly damp, river beds, hammocks pine flat woods, swamps, and cane thickets. This snake should be given a wide berth and left alone. Because of its cryptic coloration (camouflage), it can be easily overlooked, especially if it does not rattle.

**Dusky Pygmy Rattlesnake** - Average adult size is 12-24 inches (30-61 cm), record is 31 inches (79 cm). This is a small snake, but very thick for its size. The top of the triangular shaped head is covered with 9 large scales. The body color is light to dark gray. A longitudinal row of black or charcoal transverse blotches disrupts a reddish brown stripe running down the middle of the back. Dark spots on the side line up with the blotches. The tail is slender and ends in a miniature rattle. The belly is heavily mottled with black and white. The pupil of the eye is vertical (catlike), and there is a deep facial pit between the nostril and the eye. This snake is common in lowland pine flat woods, prairies, around lakes and ponds, and along the borders of many freshwater marshes and cypress swamps. This small snake has a reputation for being very aggressive. Its bite, while usually not life threatening, is extremely painful and can result in the loss of a digit. However, in some cases it can be fatal. The rattle is so small it is seldom heard. When it is heard, it sounds like an insect buzzing. Florida's two hognose snakes occasionally are confused with the Pygmy Rattlesnake. It is easy to distinguish between the harmless hognose snakes and the Pygmy Rattlesnake. The harmless hognose snakes defend themselves against potential predators by spreading (flattening) their heads and necks. If this does not scare the threat away, the hognose snakes will turn onto their backs and play dead. The hognose snakes have upturned noses and round pupils, and they also have no facial pits or rattles.

**Eastern Coral Snake** - Average adult size is 20-30 inches (51-76 cm), record is 47.5 inches (121 cm). Body ringed with black, yellow, and red; narrow yellow rings separating the wider red and black rings. The rings continue across the belly of the snake. From tip of snout to just behind the eye the head is black. The tail is black and yellow, without any red rings. The red rings usually contain black flecks or spots. The

pupil is round. This snake occupies a variety of habitats, from dry, well-drained flat woods and scrub areas to low, wet hammocks and the borders of swamps. They are quite secretive and are usually found under debris and in the ground, but occasionally they are found in the open, and have even been seen climbing the trunks of live oaks. Good numbers of them are turned up when pine flat woods are bulldozed. Because they also are ringed with red, black, and yellow or white, two harmless snakes in Florida, the Scarlet Kingsnake and the Scarlet Snake, often are confused with the Coral Snake. Both of these mimics (look-a-likes) can be distinguished from the Coral Snake by their red snouts and red on their tails. In addition, the red bands of the Scarlet Kingsnake and the Scarlet Snake never touch the yellow bands (the red and yellow are separated by the black). Also, on both the Coral Snake and the Scarlet Kingsnake the rings go around the body, but not on the Scarlet Snake which has a white belly. If you have difficulty separating the harmless mimics from the Coral Snake, the following mnemonic rhymes will identify the Coral Snake for you: 'If red touches yellow, it can kill a fellow,' and 'If its nose is black, it's bad for jack.' Because the Coral Snake is a relative of the cobras, people believe its bite nearly always is fatal. While its bite is serious and should receive immediate medical attention, statistics suggest that the bite of the Coral Snake is less threatening than the bite of a Diamondback Rattlesnake.

## **Alligators**

Alligators live in all Florida counties but are most common in the major river drainage basins and large lakes in the central and southern portions of the state. They also can be found in marshes, swamps, ponds, drainage canals, phosphate-mine settling ponds, and ditches. Alligators are tolerant of poor water-quality and occasionally inhabit brackish marshes along the coast. A few even venture into salt water.

Mature alligators seek open water areas during the April-to-May courtship and breeding season. After mating, the females move into marsh areas to nest in June and early July where they remain until the following spring. Males generally prefer open and deeper water year-round. Alligators less than four feet long typically inhabit the marshy areas of lakes and rivers. Dense vegetation in these habitats provides protective cover and many of the preferred foods of young alligators.

- Most human attacks associated with alligators occur when they have been fed by humans or when defending their nests.
- Under no circumstances should you approach an alligator closely. They are quite agile, even on land. As with any wild animal, alligators merit a measure of respect.
- Alligators are classified as a threatened species and thus enjoy the protection of state and federal law. Only representatives of the Florida Game and Fresh Water Fish Commission are empowered to handle nuisance alligators.

- It is illegal to feed, tease, harass, molest, capture or kill alligators.
- If a serious problem does exist, contact the Florida Game and Fresh Water Fish Commission.

### **6.3.1 Inclement Weather**

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

#### **Tropical Storms and Hurricanes**

As the Florida Keys are located in a tropical storm, hurricane prone area, the following information is supplied to explain the potential severity of these natural hazards. The decision to curtail operations and evacuate the area should be made by the FOL, PM, and the HSM.

During the early summer to late fall months, typically from the first of June through the end of November, disturbances migrating off the West Coast of Africa move into the Atlantic Ocean and develop into tropical cyclones known as tropical storms and hurricanes. Many of these cyclones become strong enough to threaten life and property along the Eastern Seaboard and Gulf Coast. There are three main threats associated with tropical storms and hurricanes:

- High winds
- Excessive rainfall
- Storm surge

The impacts of high winds and excessive rainfall occur hours, maybe days, before the tropical storm or hurricane makes landfall. However, the storm surge accompanies the storm or hurricane at the time that landfall occurs.

#### **High Winds**

Sustained winds vary greatly from storm to storm, but can range from 39 to 73 miles per hour (wind speeds associated with a tropical storm) to greater than 74 miles per hour (minimal wind speed for a Category 1 hurricane). Table 6-2 compares the type of storm or hurricane and the corresponding wind speed.

**TABLE 6-2  
TROPICAL STORM/HURRICANE RATING SCALE**

| <b>TYPE</b>         | <b>CATEGORY*</b> | <b>WINDS (MPH)</b> |
|---------------------|------------------|--------------------|
| Tropical Depression | NA               | >35-38             |
| Tropical Storm      | NA               | 39 – 73            |
| Hurricane           | 1                | 74 – 95            |
| Hurricane           | 2                | 96 – 110           |
| Hurricane           | 3                | 111 – 130          |
| Hurricane           | 4                | 131 – 155          |
| Hurricane           | 5                | >155               |

Based on the Saffir-Simpson scale

NA – Not Applicable

In addition to strong winds, there is the threat of debris (i.e. building material, trees, etc.) becoming airborne projectiles as they are carried by the high winds. Thunderstorms and tornadoes embedded within the tropical storm or hurricane can further increase the wind speeds on a localized level.

### **Excessive Rainfall**

Heavy rains associated with tropical storms and hurricanes also vary greatly from storm to storm. On average, an inch of rainfall an hour is not uncommon with major hurricanes, somewhat lesser amounts with tropical storms. However, the primary threat is not the intensity of rain, but the duration of rainfall. Since many tropical storms and hurricanes are slow-movers, they are capable of producing sustained heavy rainfall over a long period of time. It is not uncommon for an area to receive nearly 20 inches of rain in 24 hours. Under these conditions, street; stream and creek flooding is inevitable only to be exacerbated by locally heavier rains from thunderstorms.

### **Storm Surge**

The storm surge is an abnormal rise in sea level accompanying a hurricane or tropical storm. The height of the storm surge (usually measured in feet) is the difference in sea level from the observed level (during the storm) and the level that would have occurred in the absence of the storm or hurricane. The more intense the storm or hurricane the higher the storm surge. Storm surges become even higher if they occur during periods of high tide. Table 6-3 defines some of the terminology and possible calls to action regarding tropical cyclones:

**TABLE 6-3**  
**TROPICAL STORM/HURRICANE**  
**WATCH AND WARNING**

| STORM DESCRIPTION      | DEFINITION  | CALL TO ACTION   |
|------------------------|---|--|
| Tropical storm watch   | Tropical storm conditions are possible in the specified area of the watch, usually within 36 hours    | Weather conditions should be monitored for further advisories.<br><br>Prepare for possible evacuation by local officials   |
| Tropical Storm Warning | Tropical storm conditions are expected in the specified area of the warning, usually within 24 hours. | Work should be suspended in areas where lightning, high winds and rainfall could pose a threat to life.<br><br>Mandatory evacuations may be enforced by local officials. |
| Hurricane Watch        | Hurricane conditions are possible in the specified area of the watch, usually within 36 hours.        | Weather conditions should be monitored for further advisories.<br><br>Prepare for possible evacuation by local officials   |
| Hurricane Warning      | Hurricane conditions are expected in the specified area of the warning, usually within 24 hours.      | Mandatory evacuations will most likely be enforced by local officials.   |

A NOAA Weather Radio is the best means to receive watches and warnings from the National Weather Service. The National Weather Service continuously broadcasts updated hurricane advisories that can be received by widely available NOAA Weather Radios.

## 7.0 AIR MONITORING

Direct reading instruments will be used at the site to detect and evaluate the presence of site contaminants and other potentially hazardous conditions. As a result, specific air monitoring measures and requirements are established in Table 5-1 pertaining to the specific hazards and tasks of an identified operation. Additionally, the Health and Safety Guidance Manual, Section 1.0, contains detailed information regarding direct reading instrumentation, as well as general calibration procedures of various instruments.

### 7.1 INSTRUMENTS AND USE

Instruments will be used primarily to monitor source points and worker breathing zone areas, while observing instrument action levels. Action levels are discussed in Table 5-1 as they may apply to a specific task or location.

#### 7.1.1 Photoionization Detector or Flame Ionization Detector

In order to accurately monitor for any substances which may present an exposure potential to site personnel, a Photoionization Detector (PID) using a lamp energy of 11.7 eV or higher will be used. This instrument will be used to monitor potential source areas and to screen the breathing zones of employees during site activities. The PID with this lamp strength has been selected because it is capable of detecting the organic vapors of concern.

Prior to the commencement of any field activities, the background levels of the site must be determined and noted. Daily background readings will be taken away from any areas of potential contamination. These readings, any influencing conditions (i.e., weather, temperature, humidity) and site location must be documented in the field operations logbook or other site documentation (e.g., sample log sheet).

#### 7.1.2 Hazard Monitoring Frequency

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels that will initiate the use of elevated levels of protection. The SSO may decide to increase these frequencies based on instrument responses and site observations. The frequency at which monitoring is performed will not be reduced without the prior consent of the PHSO or HSM.

### 7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager. 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 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 employees health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure (copies of which can be found in the Health & Safety Guidance Manual which will be maintained on-site for reference). Calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. 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



## **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 both TtNUS and subcontractor personnel participating in site activities.

#### **8.1.1 Requirements for TtNUS Personnel**

TtNUS personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at the NAS Pensacola facility. Additionally, TtNUS personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training in 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 TtNUS introductory, supervisory, and refresher training as well as site-specific training will be maintained at the project. Copies of certificates or other official documentation will be used to fulfill this requirement.

#### **8.1.2 Requirements for Subcontractors**

TtNUS subcontractor personnel must have completed introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120 (e). Additionally, personnel who have had the introductory training more than 12 months ago, are required to have 8 hours of refresher training meeting the requirements of 29 CFR 1910.120 (e)(8) prior to performing field work at the NAS Pensacola facility if required. TtNUS subcontractors must certify that each employee has had such training by sending TtNUS a letter, on company letterhead, containing the information in the example letter provided as in Figure 8-1 and by providing copies of certificates for subcontractor personnel participating in site activities.

**FIGURE 8-1  
TRAINING LETTER**

The following statements must be typed on company letterhead and signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO  
XYZ CORPORATION  
555 E. 5th Street  
Nowheresville, Kansas 55555

Month, day, year

Mr. Gerry Walker  
Tetra Tech NUS, Inc.  
Task Order Manager  
1401 Oven Park Drive, Suite 102  
Tallahassee, Florida, 32312

Subject: HAZWOPER Training for NAS Pensacola, Pensacola, Florida

Dear Mr. Walker:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with the applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 1926.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hour of refresher training as applicable and as required by 29 CFR 1910.120(e)(8) and that site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

Enclosed: Training Certificates

## **8.2 SITE-SPECIFIC TRAINING**

TtNUS will provide site-specific training to TtNUS employees and subcontractor personnel who will perform work on this project. Site-specific training will also be provided to personnel (U.S. Department of Defense, EPA, etc.) who may enter the site to perform functions that may or may not be directly related to site operations. Site-Specific training will include:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present at the sites
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Initial response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of Safe Work Permits

Site-specific documentation will be established through the use of Figure 8-2. Site personnel and visitors must sign this document upon receiving site-specific training.

## **8.3 MEDICAL SURVEILLANCE**

### **8.3.1 Medical Surveillance Requirements for TtNUS Personnel**

TtNUS personnel participating in project field activities will have had a physical examination meeting the requirements of TtNUS's medical surveillance program and will be medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained in the TtNUS Tallahassee office and made available, as necessary.



### **8.3.2 Medical Surveillance Requirements for Subcontractors**

Subcontractors are required to obtain a certificate of their ability to perform hazardous waste site work and to wear respiratory protection. The "Subcontractor Medical Approval Form" provided in Figure 8-3 shall be used to satisfy this requirement, providing it is properly completed and signed by a licensed physician.

Subcontractors who have a company medical surveillance program meeting the requirements of paragraph (f) of OSHA 29 CFR 1910.120 can substitute "Subcontractor Medical Approval Form" (See Figure 8-3) with a letter, on company letterhead, containing the information in the example letter presented in Figure 8-4 of this HASP.

### **8.3.3 Requirements for Field Personnel**

Each field team member (including subcontractors) and visitors entering the Exclusion Zone(s) shall be required to complete and submit a copy of Medical Data Sheet found in the TtNUS Health and Safety Guidance Manual. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

### **8.4 SUBCONTRACTOR EXCEPTIONS**

Subcontractors who will not enter the Exclusion Zone during operation, and whose activities involve no potential for exposure to site contaminants, will not be required to meet the requirements for training/medical surveillance other than site-specific training as stipulated in Section 8.2. This exception may only be granted by the CLEAN Health and Safety Manager, Matt Soltis.

**FIGURE 8-3**

**SUBCONTRACTOR MEDICAL APPROVAL FORM**

For employees of \_\_\_\_\_  
Company Name

Participant Name: \_\_\_\_\_ Date of Exam: \_\_\_\_\_

**Part A**

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f) and found to be medically -

- qualified to perform work at the NAS Pensacola, work site
- not qualified to perform work at the NAS Pensacola, work site

and,

2. Undergone a physical examination as per OSHA 29 CFR 1910.134(b)(10) and found to be medically -

- qualified to wear respiratory protection
- not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

- A copy of OSHA Standard 29 CFR 1910.120 and appendices.
- A description of the employee's duties as they relate to the employee's exposures.
- A list of known/suspected contaminants and their concentrations (if known).
- A description of any personal protective equipment used or to be used.
- Information from previous medical examinations of the employee which is not readily available to the examining physician.

**Part B**

I, \_\_\_\_\_, have examined \_\_\_\_\_  
Physician's Name (print) Participant's Name (print)  
and have determined the following information:

**FIGURE 8-3  
SUBCONTRACTOR MEDICAL APPROVAL FORM  
PAGE TWO**

1. Results of the medical examination and tests (excluding finding or diagnoses unrelated to occupational exposure):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Recommended limitations upon the employee's assigned work:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I have informed this participant of the results of this medical examination and any medical conditions which require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NAS Pensacola work site, this participant

- may  
 may not

perform his/her assigned task.

Physician's Signature \_\_\_\_\_

Address \_\_\_\_\_

Phone Number \_\_\_\_\_

NOTE: Copies of test results are maintained and available at:

\_\_\_\_\_  
Address

**FIGURE 8-4**  
**MEDICAL SURVEILLANCE LETTER**

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO  
XYZ CORPORATION  
555 E. 5th Street  
Nowheresville, Kansas 55555

Month, day, year

Mr. Gerry Walker  
Tetra Tech NUS, Inc.  
Task Order Manager  
1401 Oven Park Drive, Suite 102  
Tallahassee, Florida, 32312

Subject: HAZWOPER Training for NAS Pensacola, Pensacola, Florida

Dear Mr. Walker:

As an officer of XYZ Corporation, I hereby state that the persons listed below 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. I further state that the persons listed below 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. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at the NAS Pensacola facility.

LIST OF FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

## 9.0 SITE CONTROL

This section outlines the means by which TtNUS 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: Exclusion Zone, Contamination Reduction Zone, and Support Zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize potentials for the spread of contaminants and to protect individuals who are not cleared to enter the work areas.

### 9.1 EXCLUSION ZONE

The Exclusion Zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are in the proposed work areas of this site. It is anticipated that this will remain so until/unless contaminants are brought to the surface by intrusive activities such as drilling. Furthermore, once such activities have been completed and surface contamination has been removed, the potential for exposure is again 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 if the site where active work is being performed plus so many feet surrounding the point of operation (See Table 5-1 for specific operation). The Exclusion Zone for this activity will represent the areas where the soils are disturbed through soil borings and sampling activities. Exclusion Zones will be delineated (as necessary) using barrier tape, cones and/or drive poles, and postings to inform and direct facility personnel.

#### 9.1.1 Exclusion Zone Clearance

A pre-startup site visit will be conducted by members of the field team in an effort to identify proposed subsurface investigation locations, conduct utility clearances, and provide up-front notices concerning scheduled activities within the facility. Subsurface activities will only proceed when utility clearance has been attained. In the event that a utility is struck during a subsurface investigative activity, the Navy Engineer-in-Charge identified in Section 2.7, Table 2-1 will be notified.

When base personnel are working within the proximity of this investigation, they will be moved or their operation temporarily discontinued to protect them from potential hazards associated with this operation.

## **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 may be delineated using barrier tape, cones, and postings to inform and direct facility personnel. Decontamination will be conducted at a central location. Potentially contaminated equipment 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 exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

## **9.4 SAFE WORK PERMITS**

Exclusion Zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task by task basis. An example of the Safe Work Permit to be used is illustrated in Figure 9-1. Partially completed Permits for the work to be performed are included in Attachment I. The daily meetings conducted at the site will further support these work permits. This effort will ensure site-specific considerations and changing conditions are incorporated into the planning effort. Permits require the signature of the FOL and/or the SSO.

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The work permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

Permits will be turned into the FOL and/or the SSO upon reaching their termination period or upon completion of the task for which the permit was issued.

**FIGURE 9-1  
SAFE WORK PERMIT**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**SECTION I: General Job Scope** (To be filled in by person performing work)

I. Work limited to the following (description, area, equipment used): \_\_\_\_\_  
\_\_\_\_\_

II. Names: \_\_\_\_\_

III. Onsite Inspection conducted  Yes  No Initials of Inspector \_\_\_\_\_  
TtNUS NAS Pensacola

**SECTION II: General Safety Requirements** (To be filled in by permit issuer)

|   |  |
|---|--|
| IV. Protective equipment required                                 | Respiratory equipment required   |
| Level D <input type="checkbox"/> Level B <input type="checkbox"/> | Full face APR <input type="checkbox"/> Escape Pack <input type="checkbox"/>  |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/> | Half face APR <input type="checkbox"/> SCBA <input type="checkbox"/>         |
| Detailed on Reverse   | SKA-PAC SAR <input type="checkbox"/> Bottle Trailer <input type="checkbox"/> |
|   | Skid Rig <input type="checkbox"/> None <input type="checkbox"/>              |

Modifications/Exceptions: \_\_\_\_\_

|                         |                 |                   |
|-------------------------|-----------------|-------------------|
| V. Chemicals of Concern | Action Level(s) | Response Measures |
| _____                   | _____           | _____             |
| _____                   | _____           | _____             |

VI. Additional Safety Equipment/Procedures

|   |   |
|---|---|
| Hardhat..... <input type="checkbox"/> Yes <input type="checkbox"/> No                 | Hearing Protection (Plugs/Muffs) <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses..... <input type="checkbox"/> Yes <input type="checkbox"/> No          | Safety belt/harness..... <input type="checkbox"/> Yes <input type="checkbox"/> No         |
| Chemical/splash goggles..... <input type="checkbox"/> Yes <input type="checkbox"/> No | Radio..... <input type="checkbox"/> Yes <input type="checkbox"/> No                       |
| Splash Shield..... <input type="checkbox"/> Yes <input type="checkbox"/> No           | Barricades..... <input type="checkbox"/> Yes <input type="checkbox"/> No                  |
| Splash suits/coveralls..... <input type="checkbox"/> Yes <input type="checkbox"/> No  | Gloves (Type)..... <input type="checkbox"/> Yes <input type="checkbox"/> No               |
| Steel toe/shank Workboots .. <input type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen..... <input type="checkbox"/> Yes <input type="checkbox"/> No           |

Modifications/Exceptions: \_\_\_\_\_

|  |                          |                          |                        |                          |                          |
|--|--------------------------|--------------------------|------------------------|--------------------------|--------------------------|
| VII. Procedure review with permit acceptors  | Yes                      | NA                       | Emergency alarms.....  | Yes                      | NA                       |
| Safety shower/eyewash (Location & Use) ..... | <input type="checkbox"/> | <input type="checkbox"/> | Evacuation routes..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Procedure for safe job completion.....       | <input type="checkbox"/> | <input type="checkbox"/> | Assembly points.....   | <input type="checkbox"/> | <input type="checkbox"/> |
| Contractor tools/equipment inspected.....    | <input type="checkbox"/> | <input type="checkbox"/> |                        |                          |                          |

VIII. Additional Permits required (Hot work, confined space entry, excavation etc.).....  Yes  No  
*If yes, fill out appropriate section(s) on safety work permit addendum*

IX. Special instructions, precautions: \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_  
Job Completed by: \_\_\_\_\_ Date: \_\_\_\_\_

## 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 TtNUS
- Regulatory personnel (DOD, OSHA, etc.)
- Southern Division Navy Personnel
- Other authorized visitors

It is not anticipated that this operation will result in a large number of site visitors. However, as some visitors can reasonably be expected, the following requirements will be enforced:

- Site visitors will be routed to the FOL, who will sign them in to the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), who they represent, and purpose for the visit.
- Site visitors will be required to produce the necessary information supporting clearance onto the site. This includes information attesting to applicable training (40-hours of HAZWOPER training required for Southern Division Navy personnel) and medical surveillance, as stipulated in Section 8 of this document. In addition, to enter the site's operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this document.

**NOTE: Site visitors will be escorted while at the site.**

Following this, the site visitor will be permitted to enter the site and applicable operational areas. Visitors are required to observe the protective equipment and site restrictions in effect at the area of their visit. Visitors not meeting the requirements as stipulated in this plan for site clearance will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause onsite activities to be terminated until that visitor can be removed. Removal of unauthorized visitors will be accomplished with support from the Base Contact, if necessary. At a minimum, the Navy On-site Representative will be notified of any unauthorized visitors.

## 9.6 SITE SECURITY

Site security will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas. As this activity takes place at Navy facilities open to public access, and along

public highways, the first line of security will take place using traffic permit restrictions, Exclusion Zone barriers, and any existing barriers at the sites to restrict the general public. The second line of security will take place at the work site referring interested parties to the FOL or designee. The FOL will serve as a focal point for non-project interested parties, and serve as the final line of security and the primary enforcement contact.

#### **9.7 SITE MAP**

Once the areas of contamination, access routes, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. When possible, 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) REQUIREMENTS**

TtNUS and subcontractor personnel will provide MSDSs for the 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 at the sites will be developed using the Health and Safety Guidance Manual. The MSDSs 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**

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crews members will not be necessary. External communication will be accomplished by using the telephones at predetermined and approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities, the FOL will determine and arrange for telephone communications.

## **10.0 SPILL CONTAINMENT PROGRAM**

### **10.1 SCOPE AND APPLICATION**

It is not anticipated that bulk hazardous materials (over 55-gallons) will be 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, the potential may exist for accumulating Investigative Derived Wastes (IDW) such as decontamination fluids, soil cuttings, and purge and well development waters, in a central staging area. Once these fluids and other materials have been characterized, they can be removed from this area and properly disposed.

### **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

It is anticipated that the IDW generated as a result of this scope of work 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 or in the Resource Deployment 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 initial 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 minimum equipment that may be maintained (depending on anticipated need) 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.N 1A2)
- Shovels, rakes, and brooms
- Container labels

## **10.6 SPILL CONTROL PLAN**

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

1. 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.
2. Employ the personal protective equipment stored at the staging area. 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. Spread the absorbent material in the area of the spill, covering it completely.
3. 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.
4. Recontainerize 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 any confined spaces. 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, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which 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 Health and Safety Guidance Manual 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.

## 12.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for the chemicals brought on-site, including decon solution, fuels, sample preservations, calibration gases, etc.
- A full size OSHA Job Safety and Health Poster
- Training/Medical Surveillance Documentation Form (blank)
- Emergency Reference Form (Section 2.0, extra copy for posting)

### 12.1 MATERIALS TO BE POSTED OR MAINTAINED 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.

**Material Safety Data Sheets (MSDS) (maintained)** - The MSDSs 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 used on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

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

**Site Clearance (maintained)** - This list is found within the training section of the HASP (See Figure 8-2). This list identifies the site personnel, dates of training (including site-specific training), and medical surveillance. The lists 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. A copy of this sheet will be on file in the site office.

**Hearing Conservation Standard (29 CFR 1910.95) (posted)** - this standard will be posted anytime hearing protection or other noise abatement procedures are employed.

**Personnel Monitoring (maintained)** - 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, as stated above, is to allow site personnel quick access to this information. Variations concerning location and methods of presentation are acceptable, providing the objection is accomplished.

## 13.0 GLOSSARY

|          |  |
|----------|--|
| ACGIH    | American Conference of Governmental Industrial Hygienists                |
| CERCLA   | Comprehensive Environmental Response, Compensation, and Liability Act    |
| CFR      | Code of Federal Regulations  |
| CLEAN    | Comprehensive Long-term Environmental Action - Navy                      |
| CNS      | Central Nervous System   |
| CTO      | Contract Task Order  |
| CZR      | Contamination Reduction Zone   |
| DOD      | United States Department of Defense                                      |
| eV       | electron Volts   |
| FOL      | Field Operations Leader  |
| HASP     | Health and Safety Plan   |
| HAZWOPER | Hazardous Waste Operations and Emergency Response                        |
| HSM      | Health and Safety Manager  |
| IDLH     | Immediate Dangerous to Life or Health                                    |
| IDW      | Investigative-Derived Wastes   |
| LEL/LFL  | Lower Explosive Limit / Lower Flammable Limit                            |
| MSDS     | Material Safety Data Sheets  |
| N/A      | Not Available  |
| NAS      | Naval Air Station  |
| NIOSH    | National Institute for Occupational Safety and Health                    |
| NTP      | National Toxicity Program  |
| OSHA     | Occupational Safety and Health Administration (U.S. Department of Labor) |
| PEL      | Permissible Exposure Limit   |
| PID      | Photoionization Detector   |
| PPE      | Personal Protective Equipment  |
| SAP      | Sampling and Analyses Plan   |
| SOPs     | Standard Operating Procedures  |
| SSO      | Site Safety Officer  |
| TBD      | To be determined   |
| TLV      | Threshold Limit Value  |
| TOM      | Task Order Manager   |
| TWA      | Time-Weighted Average  |
| WP       | Work Plan  |

**ATTACHMENT I**

**INJURY/ILLNESS PROCEDURE  
AND REPORT FORM**



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT

To: \_\_\_\_\_  
Subsidiary Health and Safety Representative

Prepared by: \_\_\_\_\_

cc: \_\_\_\_\_  
Workers Compensation Administrator

Position: \_\_\_\_\_

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

Office: \_\_\_\_\_

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

Telephone number: \_\_\_\_\_

Fax number: \_\_\_\_\_

**Information Regarding Injured or Ill Employee**

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

Office: \_\_\_\_\_

Home address: \_\_\_\_\_

Gender: M  F  No. of dependents: \_\_\_\_\_

Home telephone number: \_\_\_\_\_

Marital status: \_\_\_\_\_

Occupation (regular job title): \_\_\_\_\_

Date of birth: \_\_\_\_\_

Department: \_\_\_\_\_

Social security number: \_\_\_\_\_

Date of Accident: \_\_\_\_\_

Time of Accident: \_\_\_\_\_ a.m.  p.m.

Time Employee Began Work: \_\_\_\_\_

Check if time cannot be determined

**Location of Incident**

Street address: \_\_\_\_\_

City, state, and zip code: \_\_\_\_\_

County: \_\_\_\_\_

Was place of accident or exposure on employer's premises? Yes  No

**Information About the Incident**

**What was the employee doing just before the incident occurred?** Describe the activity as well as the tools, equipment, or material the employee was using. Be specific. Examples: "Climbing a ladder while carrying roofing materials"; "Spraying chlorine from hand sprayer"; "Daily computer key-entry"

**What Happened?** Describe how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time"

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

Information About the Incident (Continued)

What was the injury or illness? Describe the part(s) of the body affected and how it was affected. Be more specific than "hurt," "pain," or "sore." Examples "Strained back"; "Chemical burn, right hand"; "Carpal tunnel syndrome, left wrist"

Describe the Object or Substance that Directly Harmed the Employee: Examples: "Concrete floor"; "Chlorine"; "Radial arm saw." If this question does not apply to the incident, write "Not applicable."

Did the employee die? Yes [ ] No [ ] Date of death: \_\_\_\_\_

Was employee performing regular job duties? Yes [ ] No [ ]

Was safety equipment provided? Yes [ ] No [ ] Was safety equipment used? Yes [ ] No [ ]

Note: Attach any police reports or related diagrams to this report.

Witness (Attach additional sheets for other witnesses.)

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

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

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Medical Treatment Required? [ ] Yes [ ] No [ ] First aid only

Name of physician or health care professional: \_\_\_\_\_

If treatment was provided away from the work site, provide the information below.

Facility name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Was the employee treated in an emergency room? [ ] Yes [ ] No

Was the employee hospitalized over night as an in-patient? [ ] Yes [ ] No

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

**Corrective Action(s) Taken by Unit Reporting the Accident:**

**Corrective Action Still to be Taken (by whom and when):**

**Name of Tetra Tech employee the injury or illness was first reported to:** \_\_\_\_\_

**Date of Report:** \_\_\_\_\_ **Time of Report:** \_\_\_\_\_

I have reviewed this investigation report and agree, to the best of my recollection, with its contents.

\_\_\_\_\_  
Printed Name of Injured Employee

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature of Injured Employee

\_\_\_\_\_  
Date

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

| Title  | Printed Name | Signature | Telephone Number | Date |
|--|--------------|-----------|------------------|------|
| Office Manager   |              |           |                  |      |
| Project Manager  |              |           |                  |      |
| Site Safety Coordinator or Office Health and Safety Representative |              |           |                  |      |

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

**To Be Completed by the Subsidiary Health and Safety Representative**

**Classification of Incident:**  
 Injury     Illness

**Result of Incident:**  
 First aid only  
 Days away from work  
 Remained at work but incident resulted in job transfer or work restriction  
 Incident involved days away and job transfer or work restriction  
 Medical treatment only

No. of days away from work \_\_\_\_\_  
Date employee left work \_\_\_\_\_  
Date employee returned to work \_\_\_\_\_  
No. of days placed on restriction or job transfer: \_\_\_\_\_

OSHA Recordable Case Number \_\_\_\_\_

**To Be Completed by Human Resources**

Social security number: \_\_\_\_\_  
Date of hire: \_\_\_\_\_ Hire date for current job: \_\_\_\_\_  
Wage information: \$ \_\_\_\_\_ per  Hour  Day  Week  Month  
Position at time of hire: \_\_\_\_\_  
Current position: \_\_\_\_\_ Shift hours: \_\_\_\_\_  
State in which employee was hired: \_\_\_\_\_  
Status:  Full-time     Part-time    Hours per week: \_\_\_\_\_    Days per week: \_\_\_\_\_  
Temporary job end date: \_\_\_\_\_

**To Be Completed during Report to Workers Compensation Carrier**

Date reported: \_\_\_\_\_ Reported by: \_\_\_\_\_  
Confirmation number: \_\_\_\_\_  
Name of contact: \_\_\_\_\_  
Field office of claims adjuster: \_\_\_\_\_

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.

**ATTACHMENT II**

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



TETRA TECH NUS, INC.

# STANDARD OPERATING PROCEDURES

|               |                       |      |          |
|---------------|-----------------------|------|----------|
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| Effective     | 03/00                 | Date | Revision |
|               |                       |      | 1        |
| Applicability | Tetra Tech NUS, Inc.  |      |          |
| Prepared      | Health & Safety       |      |          |
| Approved      | D. Senovich <i>DS</i> |      |          |

Subject  
UTILITY LOCATING AND EXCAVATION CLEARANCE

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## 1.0 PURPOSE

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

The purpose of this procedure is to provide minimum requirements and technical guidelines regarding the appropriate procedures to be followed when performing subsurface and overhead utility locating services. It is the policy of Tetra Tech NUS, Inc. (TtNUS) to provide a safe and healthful work environment for the protection of our employees. The purpose of this Standard Operating Procedure (SOP) is to aid in achieving the objectives of the TtNUS Utility Locating and Clearance Policy. The TtNUS Utility Locating and Clearance Policy must be reviewed by anyone potentially involved with underground or overhead utility services.

## 2.0 SCOPE

This procedure applies to all TtNUS field activities where there may be potential contact with underground or overhead utilities. This procedure provides a description of the principles of operation, instrumentation, applicability, and implementability of typical methods used to determine the presence or absence of utility services. This procedure is intended to assist with work planning and scheduling, resource planning, field implementation, and subcontractor procurement. Utility locating and excavation clearance requires site-specific information prior to the development of detailed operating procedures. This guidance is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the geophysical methods may also be required.

## 3.0 GLOSSARY

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

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

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

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

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

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

## 4.0 RESPONSIBILITIES

Project Manager (PM)/Task Order Manager (TOM) - Responsible for ensuring that all field activities are conducted in accordance with this procedure and the TtNUS Utility Locating and Clearance Policy.

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

Site Health & Safety Officer (SHSO) – Responsible to provide technical assistance and verify full compliance with this SOP and the TtNUS Utility Locating and Clearance Policy. The SHSO is also responsible for reporting any deficiencies to the Corporate Health and Safety Manager (HSM) and to the PM/TOM.

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

Site Personnel – Responsible for understanding and implementing this SOP and the TtNUS Utility Locating and Clearance Policy.

## **5.0 PROCEDURES**

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

### **5.1 Buried Utilities**

Buried utilities present a heightened concern because their location is not typically obvious by visual observation, and it is common that their presence and/or location is unknown or incorrectly known on client properties. The following procedure must be followed prior to beginning any excavation that might potentially be in the vicinity of underground utility services. In addition, the Utility Clearance Form (Attachment 3) must be completed for every location or cluster of locations where intrusive activities will occur.

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

1. A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities. Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities. Information regarding utility locations shall be added to project maps upon completion of this exercise.
- 2., A visual site inspection must be performed to compare the site plan information to actual field conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities. Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scapes and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility locations shall be added to project maps upon completion of this exercise and returned to the PM/TOM.

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3. If the planned work is to be conducted on private property (e.g., military installations, manufacturing facilities, etc.) the FOL must identify and contact appropriate facility personnel (e.g., public works or facility engineering) before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.

4. If the work location is on public property, the state agency that performs utility clearances must be notified (see Attachment 1). State "one-call" services must be notified prior to commencing fieldwork per their requirements. Most one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again. The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, "one call" systems may still be required to provide location services on military installations.

5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code:

|        |  |
|--------|--|
| white  | excavation/subsurface investigation location |
| red    | electrical                                   |
| yellow | gas, oil, steam                              |
| orange | telephone, communications                    |
| blue   | water, irrigation, slurry                    |
| green  | sewer, drain                                 |

6. Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using such methods as passive and intrusive surveys, physical probing, or hand augering. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in many states, initial excavation is required by hand to a specified depth.

7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment, and where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed with a hand auger or pole (tile probe) made of non-conductive material. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.

8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TtNUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

## 5.2 Overhead Power Lines

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by the utility company or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be

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adequate to prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

The following table provides the required minimum clearances for working in proximity to overhead power lines.

| <u>Nominal Voltage</u> | <u>Minimum Clearance</u>   |
|------------------------|--|
| 0 -50 kV               | 10 feet, or one mast length; whichever is greater  |
| 50+ kV                 | 10 feet plus 4 inches for every 10 kV over 50 kV or 1.5 mast lengths; whichever is greater |

## 6.0 UNDERGROUND LOCATING TECHNIQUES

### 6.1 Geophysical Methods

Geophysical methods include electromagnetic induction, magnetics, and ground penetrating radar. Additional details concerning the design and implementation of electromagnetic induction, magnetics, and ground penetrating radar surveys can be found in one or more of the TtNUS SOPs included in the References (Section 8.0).

#### **Electromagnetic Induction**

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

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

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

#### **Magnetics**

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

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

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## Ground Penetrating Radar

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

### 6.2 Passive Detection Surveys

#### Acoustic Surveys

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

#### Thermal Imaging

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

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

### 6.3 Intrusive Detection Surveys

#### Vacuum Excavation

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

#### Hand-auger Surveys

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings must be hand-augered for all locations where there is a potential to impact buried utilities. The minimum hand-auger depth that must be reached is to be determined considering the geographical location of the work site. This approach recognizes that the

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placement of buried utilities is influenced by frost line depths that vary by geographical region. Attachment 2 presents frost line depths for the regions of the contiguous United States. At a minimum, hand-auger depths must be at least to the frost line depth plus two (2) feet, but never less than 4 feet below ground surface (bgs). For augering, the hole must be reamed by hand to at least the diameter of the drill rig auger or bit prior to drilling. For soil gas surveys, the survey probe shall be placed as close as possible to the cleared hand-auger. It is important to note that a post-hole digger must not be used in place of a hand-auger.

**Tile Probe Surveys**

For some soil types, site conditions, and excavation requirements, tile probes may be used instead of or in addition to hand-augers. Tile probes must be performed to the same depth requirements as hand-augers. Depending upon the site conditions and intended probe usage, tile probes should be made of non-conductive material such as fiberglass.

**7.0 INTRUSIVE ACTIVITIES SUMMARY**

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

1. Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.
2. Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.

Note: Drawings with confirmed locations should be provided to the property owner and/or client as soon as possible to reduce potential time delays.

3. Notify "One Call" service. If possible, arrange for an appointment to show the One Call representative the subsurface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.
4. Complete Attachment 3, Utility Clearance Form. This form should be completed for each excavation location. In situations where multiple subsurface locations exist within the close proximity of one another, one form may be used for multiple locations provided those locations are noted on the Utility Clearance Form. Upon completion, the Utility Clearance Form and revised/annotated utility location map becomes part of the project file.

**8.0 REFERENCES**

TtNUS Utility Locating and Clearance Policy  
TtNUS SOP GH-3.1; Resistivity and Electromagnetic Induction  
TtNUS SOP GH-3.2; Magnetic and Metal Detection Surveys  
TtNUS SOP GH-3.4; Ground-penetrating Radar Surveys

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**ATTACHMENT 1  
LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES**

|   |   |
|---|---|
| <b>ALABAMA</b><br>Alabama Line Location (800) 292-8525<br>Tucson Blue Stake Center (800) 782-5348   | <b>Maine</b><br>Dig Safe – Maine (800) 225-4977   |
| <b>Alaska</b><br>Locate Call Center of Alaska Inc. (800) 478-3121   | <b>Maryland</b><br>Miss Utility (800) 257-777   |
| <b>Arizona</b><br>Arizona Blue Stake Inc. (800) 782-5348  | <b>Massachusetts</b><br>Dig Safe – Massachusetts (800) 322-4844   |
| <b>Arkansas</b><br>Arkansas One Call System Inc. (800) 482-8998   | <b>Michigan</b><br>Miss Dig System (800) 482-7171   |
| <b>California</b><br>Underground Service Alert North (800) 227-2600<br>Underground Service Alert South (800) 227-2600   | <b>Minnesota</b><br>Gopher State One Call (800) 252-1166  |
| <b>Colorado</b><br>Utility Notification Center of Colorado<br>(800) 922-1987  | <b>Mississippi</b><br>Mississippi One-Call System Inc. (800) 227-6477   |
| <b>Connecticut</b><br>Call Before You Dig (800) 922-4455  | <b>Missouri</b><br>Missouri One Call System Inc. (800) 344-7483   |
| <b>Delaware</b><br>Miss Utility of Delmarva<br>(800) 282-8555   | <b>Montana</b><br>Utilities Underground Location Center<br>(800) 424-5555<br>Montana One Call Center (800) 551-8344                                     |
| <b>District of Columbia</b><br>Miss Utility (800) 257-7777  | <b>Nebraska</b><br>Diggers Hotline of Nebraska (800) 331-5666   |
| <b>Florida</b><br>Call Sunshine (800) 432-4770  | <b>Nevada</b><br>Underground Service Alert North (800) 227-2600   |
| <b>Georgia</b><br>Utilities Protection Center Inc.<br>(800) 282-7411  | <b>New Hampshire</b><br>Dig Safe – New Hampshire (800) 225-4977   |
| <b>Idaho</b><br>Palouse Empire Underground Coordinating Council<br>(800) 882-1974<br><br>Utilities Underground Location Center<br>(800) 424-5555<br><br>Kootenai Country Utility Coordinating Council<br>(800) 428-4950<br><br>Shoshone County One Call (800) 398-3285<br><br>Dig Line (800) 342-1585<br><br>One Call Concepts (800) 626-4950 | <b>New Jersey</b><br>New Jersey One Call (800) 272-1000   |
| <b>Illinois</b><br>Julie Inc. (800) 892-0123<br>Digger (Chicago Utility Alert Network)<br>(312) 744-7000  | <b>New Mexico</b><br>New Mexico One Call System Inc.<br>(800) 321-ALERT<br><br>Las Cruces-Dona Utility Council (505) 526-0400                           |
| <b>Indiana</b><br>Indiana Underground Plant Protection Services<br>(800) 382-5544   | <b>New York</b><br>Underground Facilities Protection Organization<br>(800) 962-7962<br><br>New York City: Long Island One Call Center<br>(800) 272-4480 |
| <b>Iowa</b><br>Underground Plant Location Service Inc.<br>(800) 292-8989  | <b>North Carolina</b><br>The North Carolina One-Call Center Inc.<br>(800) 632-4949  |
| <b>Kansas</b><br>Kansas One-Call Center (800) 344-7233  | <b>North Dakota</b><br>Utilities Underground Location Center<br>(800) 795-0555  |
| <b>Kentucky</b><br>Kentucky Underground Protection Inc.<br>(800) 752-6007   | <b>Ohio</b><br>Ohio Utilities Protection Service<br>(800) 362-2764<br><br>Oil & Gas Producers Underground Protection Service<br>(800) 925-0988          |
| <b>Louisiana</b><br>Louisiana One Call (800) 272-3020   | <b>Oklahoma</b><br>Call Okie (800) 522-6543   |

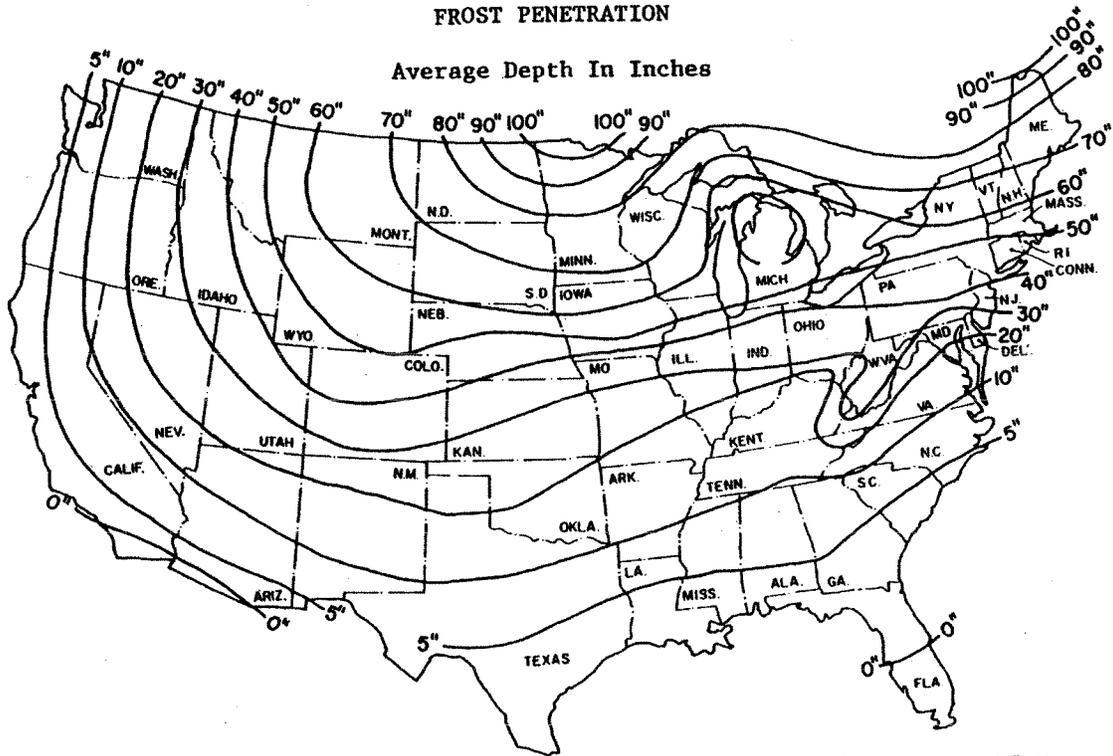
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|--|
| <p><b>Oregon</b><br/>Utilities Underground Location Center<br/>(800) 424-5555</p> <p>Douglas Utilities Coordinating Council<br/>(503) 673-6676</p> <p>Josephine Utilities Coordinating Council<br/>(503) 476-6676</p> <p>Rogue Basin Utility Coordinating Council<br/>(503) 779-6676</p> <p>Utilities Notification Center<br/>(800) 332-2344</p>   |
| <p><b>Pennsylvania</b><br/>Pennsylvania One Call System Inc.<br/>(800) 242-1776</p>  |
| <p><b>Rhode Island</b><br/>Dig Safe – Rhode Island (800) 225-4977</p>  |
| <p><b>South Carolina</b><br/>Palmetto Utility Protection Service Inc.<br/>(800) 922-0983</p>   |
| <p><b>South Dakota</b><br/>South Dakota One Call (800) 781-7474</p>  |
| <p><b>Tennessee</b><br/>Tennessee One-Call System (800) 351-1111</p>   |
| <p><b>Texas</b><br/>Texas One Call System (800) 245-4545</p> <p>Texas Excavation Safety System (800) 344-8377</p> <p>Lone Star Notification Center (800) 669-8344</p>  |
| <p><b>Utah</b><br/>Blue Stakes Location Center (800) 662-4111</p>  |
| <p><b>Vermont</b><br/>Dig Safe – Vermont (800) 225-4977</p>  |
| <p><b>Virginia</b><br/>Miss Utility of Virginia (800) 552-7001</p> <p>Miss Utility (800) 257-7777</p> <p>Miss Utility of Delmarva (800) 441-8355</p>   |
| <p><b>Washington</b><br/>Utilities Underground Location Center<br/>(800) 424-5555</p> <p>Grays Harbor &amp; Pacific County<br/>Utility Coordinating Council<br/>(206) 535-3550</p> <p>Utilities County of Cowlitz County<br/>(360) 425-2506</p> <p>Chelan-Douglas Utilities Coordinating Council<br/>(509) 663-6111</p> <p>Upper Yakima County<br/>Underground Utilities Council<br/>(800) 553-4344</p> <p>Inland Empire Utility Coordinating Council<br/>(509) 456-8000</p> <p>Palouse Empire Utilities Coordinating Council<br/>(800) 822-1974</p> <p>Utilities Notification Center (800) 332-2344</p> |
| <p><b>West Virginia</b><br/>Miss Utility of West Virginia Inc. (800) 245-4848</p>  |
| <p><b>Wisconsin</b><br/>Diggers Hotline Inc. (800) 242-8511</p>  |

|  |
|--|
| <p><b>Wyoming</b><br/>West Park Utility Coordinating Council<br/>(307) 587-4800</p> <p>Call-In Dig-In Safety Council (800) 300-9811</p> <p>Fremont County Utility Coordinating Council<br/>(800) 489-8023</p> <p>Central Wyoming Utilities Coordinating Council<br/>(800) 759-8035</p> <p>Southwest Wyoming One Call (307) 362-8888</p> <p>Carbon County Utility<br/>Utility Coordinating Council (307) 324-6666</p> <p>Albany County Utility Coordinating Council<br/>(307) 742-3615</p> <p>Southeast Wyoming Utilities Coordinating Council<br/>(307) 638-6666</p> <p>Wyoming One-Call<br/>(800) 348-1030</p> <p>Utilities Underground Location Center<br/>(800) 454-5555</p> <p>Converse County Utility Coordination Council<br/>(800) 562-5561</p> |
|--|

ATTACHMENT 2

FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

|   |                  |                         |
|---|------------------|-------------------------|
| Subject<br><br>UTILITY LOCATING AND<br>EXCAVATION CLEARANCE | Number<br>HS-1.0 | Page<br>11 of 11        |
|   | Revision<br>1    | Effective Date<br>03/00 |

**ATTACHMENT 3  
UTILITY CLEARANCE FORM**

Client: \_\_\_\_\_ Project Name: \_\_\_\_\_  
Project No.: \_\_\_\_\_ Completed By: \_\_\_\_\_  
Location Name: \_\_\_\_\_ Work Date: \_\_\_\_\_  
Excavation Method/Overhead Equipment: \_\_\_\_\_

1. **Underground Utilities** Circle One
- a) Review of existing maps? yes no N/A
  - b) Interview local personnel? yes no N/A
  - c) Site visit and inspection? yes no N/A
  - d) Excavation areas marked in the field? yes no N/A
  - e) Utilities located in the field? yes no N/A
  - f) Located utilities marked/added to site maps? yes no N/A
  - g) Client contact notified yes no N/A  
Name \_\_\_\_\_ Telephone: \_\_\_\_\_ Date: \_\_\_\_\_
  - g) State One-Call agency called? yes no N/A  
Caller: \_\_\_\_\_  
Ticket Number: \_\_\_\_\_ Date: \_\_\_\_\_
  - h) Geophysical survey performed? yes no N/A  
Survey performed by: \_\_\_\_\_  
Method: \_\_\_\_\_ Date: \_\_\_\_\_
  - i) Hand augering performed? yes no N/A  
Augering completed by: \_\_\_\_\_  
Total depth: \_\_\_\_\_ feet Date: \_\_\_\_\_
  - j) Trench/excavation probed? yes no N/A  
Probing completed by: \_\_\_\_\_  
Depth/frequency: \_\_\_\_\_ Date: \_\_\_\_\_

2. **Overhead Utilities** Present Absent
- a) Determination of nominal voltage yes no N/A
  - b) Marked on site maps yes no N/A
  - c) Necessary to lockout/insulate/re-route yes no N/A
  - d) Document procedures used to lockout/insulate/re-route yes no N/A
  - e) Minimum acceptable clearance (SOP Section 5.2): \_\_\_\_\_

3. Notes:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Approval:

\_\_\_\_\_  
Site Manager/Field Operations Leader Date

c: PM/Project File  
Program File

**ATTACHMENT II A**

**STATE OF FLORIDA**

**UNDERGROUND FACILITY**

**DAMAGE PREVENTION**

**AND SAFETY ACT**

The Underground Facility Damage Prevention and Safety Act, Chapter 556, Florida Statutes, passed in the House on March 19, 2002 and in the Senate on March 20, 2002. Upon approval of the governor, the new law goes into effect October 1, 2002. Below is a summary of the changes.

1. The notification requirement for excavation work will change from 48 hours to two full business days; 10 business days for underwater excavation. Underground facilities located underwater must be marked with buoys or other suitable devices.
2. An excavator will be required to pre-mark (white-line) the proposed excavation area if he cannot provide a description that allows the member to easily identify the excavation site (by county, city or closest city, street address or closest street, road or intersection to the excavation site and the construction limits of the excavation), and the excavator and the member have not mutually agreed otherwise. Pre-marking will not be required for excavation projects over 500 feet in length or where pre-marking could reasonably interfere with traffic or pedestrian control.
3. When working within the tolerance zone (defined as 24" from either edge of the exterior surface of a marked underground facility), excavators will be required to use increased caution to protect underground facilities. This protection requires hand digging, pot holing, soft digging, vacuum excavation or similar procedures to identify underground facilities. The use of any mechanized equipment within the tolerance zone will require supervision by the excavator.
4. Member operators will no longer be exempted from the locating requirements of the Act if they have underground facilities that have not been taken out of service and that are locatable using available designating technologies.
5. After SSOCOF receives notification of a member's inability to comply with the locate requirements of the Act, SSOCOF will be required, upon completion of a location request, to notify excavators of the member's inability to comply.
6. During a period of extraordinary circumstances (a hurricane or natural/man-made disaster), SSOCOF will not be required to remain available if SSOCOF is adversely affected by the extraordinary circumstances.
7. SSOCOF will be required to implement positive response procedures by January 1, 2004.
8. If an underground facility owner fails to become a member of SSOCOF, and that owner's underground facility is damaged by an excavator who has complied with the requirements of the Act and has exercised reasonable care in the performance of the excavation, the owner will have no right of recovery against the excavator for damage to the underground facility.
9. Member operators who fail to mark an underground facility (but not those who incorrectly mark an underground facility) will be in violation of the Act, a non-criminal infraction.
10. Any local law enforcement officer or permitting agency inspector may enforce the Act without the requirement for the Act to be incorporated into a local code or ordinance.
11. Citations for violating the Act may be issued to any employee of the excavator or member operator who is directly involved in the non-criminal infraction.
12. Knowingly and willfully removing or otherwise destroying valid physical markings (paint, stakes, flags, etc.) will be a second-degree misdemeanor. Stakes or other nonpermanent markings will be valid for 20 calendar days after notification is provided to the system.
13. Each member will be required to provide to the system annually, and keep current thereafter, the contact names and telephone numbers of individuals who may be contacted by design engineers, architects, surveyors, and planners for the purpose of responding to requests for design services. Each member operator will also be required to provide to the system annually and keep current thereafter, a list of fees applicable to each type of design service that each member operator chooses to offer to design engineers, architects, surveyors and planners.

14. SSOCOF shall study the feasibility of implementing a procedure for notification to member operators of requests for design services, including the right to recover reasonable and compensatory costs from the users, and shall report the results of the study to the legislature before January 1, 2004.
15. The new design services requirements of the Act do not apply to any state agency, municipality or county or contractors, consultants, agents, or persons or firms acting under their authority in the planning, preparing, or performance of work in their right-of-way. This section does not limit or expand any existing law governing the process a state agency, municipality or county uses to request design services from member operators or the responsibility for providing or paying for such services.

**ATTACHMENT III**

**EQUIPMENT INSPECTION CHECKLIST**

## EQUIPMENT INSPECTION

**COMPANY:** \_\_\_\_\_ **UNIT NO.** \_\_\_\_\_

**FREQUENCY:** Inspect daily, document prior to use and as repairs are needed.

Inspection Date: \_\_\_/\_\_\_/\_\_\_ Time: \_\_\_\_\_ Equipment Type: \_\_\_\_\_

|   | (e.g., bulldozer)        |                          |                          |
|---|--------------------------|--------------------------|--------------------------|
|   | Good                     | Need Repair              | N/A                      |
| Tires or tracks   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hoses and belts   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cab, mirrors, safety glass  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Is the equipment equipped with audible back-up alarms and back-up lights?                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Horn and gauges   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Brake condition (dynamic, park, etc.)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fire extinguisher (Type/Rating - _____)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fluid Levels:   |                          |                          |                          |
| - Engine oil  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Transmission fluid  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Brake fluid   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Cooling system fluid  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Windshield wipers   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - Hydraulic oil   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Oil leak/lube   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Coupling devices and connectors   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Exhaust system  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Blade/boom/ripper condition   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Accessways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Power cable and/or hoist cable  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Steering (standard and emergency)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Safety Guards:**

|   | Yes                      | No                       |
|---|--------------------------|--------------------------|
| - Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| - Hot pipes and surfaces exposed to accidental contact? _____   | <input type="checkbox"/> | <input type="checkbox"/> |
| - All emergency shut offs have been identified and communicated to the field crew? _____  | <input type="checkbox"/> | <input type="checkbox"/> |
| - Have emergency shutoffs been field tested? _____  | <input type="checkbox"/> | <input type="checkbox"/> |
| - Results? _____  | <input type="checkbox"/> | <input type="checkbox"/> |
| - Are any structural members bent, rusted, or otherwise show signs of damage? _____   | <input type="checkbox"/> | <input type="checkbox"/> |
| - Are fueling cans used with this equipment approved type safety cans? _____  | <input type="checkbox"/> | <input type="checkbox"/> |

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? \_\_\_\_\_

**Portable Power Tools:**

- Tools and Equipment in Safe Condition? \_\_\_\_\_
- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? \_\_\_\_\_
- Portable electric tools properly grounded? \_\_\_\_\_
- Damage to electrical power cords? \_\_\_\_\_
- Blade guards in place? \_\_\_\_\_
- Components adjusted as per manufacturers recommendation? \_\_\_\_\_

**Cleanliness:**

- Overall condition (is the decontamination performed prior to arrival on-site considered acceptable)? \_\_\_\_\_
- Where was this equipment used prior to its arrival on site? \_\_\_\_\_
- Site Contaminants of concern at the previous site? \_\_\_\_\_
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? \_\_\_\_\_

**Operator Qualifications (as applicable for all heavy equipment):**

- Does the operator have proper licensing where applicable, (e.g., CDL)? \_\_\_\_\_
- Does the operator, understand the equipments operating instructions? \_\_\_\_\_
- Is the operator experienced with this equipment? \_\_\_\_\_
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? \_\_\_\_\_
- Is the operator 21 years of age or more? \_\_\_\_\_

**Identification:**

- Is a tagging system available, for positive identification, for tools removed from service? \_\_\_\_\_

**Additional Inspection Required Prior to Use On-Site**

- |  | <b>Yes</b>               | <b>No</b>                |
|--|--------------------------|--------------------------|
| - Does equipment emit noise levels above 90 decibels?                      | <input type="checkbox"/> | <input type="checkbox"/> |
| - If so, has an 8-hour noise dosimetry test been performed?                | <input type="checkbox"/> | <input type="checkbox"/> |
| - Results of noise dosimetry: _____  |                          |                          |
| - Defects and repairs needed: _____  |                          |                          |
| - General Safety Condition: _____  |                          |                          |
| - Operator or mechanic signature: _____                                    |                          |                          |
| Approved for Use: <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |

\_\_\_\_\_  
Site Safety Officer Signature

**ATTACHMENT IV**

**SAFE WORK PERMITS**





**SAFE WORK PERMIT  
MULTI-MEDIA SAMPLING  
NAS PENSACOLA, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**SECTION I: General Job Scope**

- I. Work limited to the following (description, area, equipment used): Multi media sampling including soils (surface and sub surface); groundwater, and IDW.
- II. Required Monitoring Instrument(s): PID with 11.7 eV lamp or FID
- III. Field Crew: \_\_\_\_\_
- IV. On-site Inspection conducted  Yes  No Initials of Inspector TtNUS

**SECTION II: General Safety Requirements (To be filled in by permit issuer)**

- V. Protective equipment required
    - Level D  Level B
    - Level C  Level A
    - Detailed on Reverse
  - Respiratory equipment required
    - Full face APR
    - Half face APR
    - SKA-PAC SAR
    - Skid Rig
  - Escape Pack
  - SCBA
  - Bottle Trailer
  - None
- Modifications/Exceptions: NONE

| VI. Chemicals of Concern  | Action Level(s)                          | Response Measures  |
|---|--|--|
| <u>VOCs (Benzene Ethylbenzene, Toluene, Trichloroethylene, Xylene, and Methylene Chloride), and PACs Methylnaphthalene and Naphthalene.</u> | <u>Sustained above background levels</u> | <u>Evacuate area only investigate when safe levels returned to background Per MSDS</u> |

- VII. Additional Safety Equipment/Procedures
 

|  |   |
|--|---|
| Hard-hat..... <input type="checkbox"/> Yes <input type="checkbox"/> No                                   | Hearing Protection (Plugs/Muffs)... <input type="checkbox"/> Yes <input type="checkbox"/> No      |
| Safety Glasses ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                 | Safety belt/harness..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No      |
| Chemical/splash goggles ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No        | Radio..... <input type="checkbox"/> Yes <input type="checkbox"/> No                               |
| Splash Shield..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                   | Barricades..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No               |
| Splash suits/coveralls ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                    | Gloves (Type - Nitrile) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | Work/rest regimen..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No        |
| Chemical Resistant Boot Covers ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Impermeable apron..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No        |

Modifications/Exceptions: Tyvek coverall if there is a potential for soiling work clothes and PVC or PE coated Tyvek if saturation or work clothes may occur. Impermeable aprons may be used in lieu of the coveralls if it can be demonstrated that it offers as much protection as the coveralls. This modification may be made to support measures against effects of heat stress.

- VIII. Procedure review with permit acceptors
 

|   |   |
|---|---|
| Safety shower/eyewash (Location & Use) ..... <input type="checkbox"/> Yes <input type="checkbox"/> NA   | Emergency alarms ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA  |
| Procedure for safe job completion ..... <input type="checkbox"/> Yes <input type="checkbox"/> NA        | Evacuation routes ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA |
| Contractor tools/equipment/PPE inspected ..... <input type="checkbox"/> Yes <input type="checkbox"/> NA | Assembly points..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA    |

- IX. Site Preparation
 

|  |                              |                             |                             |
|--|------------------------------|-----------------------------|-----------------------------|
| Utility Locating and Excavation Clearance completed .....    | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| Vehicle and Foot Traffic Routes Cleared and Established..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| Physical Hazards Barricaded and Isolated .....               | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |
| Emergency Equipment Staged .....                             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> NA |

- X. Additional Permits required (Hot work, confined space entry, excavation etc.).....  Yes  No  
*If yes, complete permit required or contact Health Sciences, Pittsburgh Office*

- XI. Special instructions, precautions: Avoid potential nesting areas. Snake chaps or leggings should be worn in areas prone to snakes. Remote sampling devices should be used for sample acquisition obstructed view areas due to potential for alligators and snakes. The SSO shall preview work areas for signs of habitation, nesting, or foraging in remote areas where sampling is to be conducted. Wear light colored clothing so that ticks and other biting insects can be easily visible and can be removed. Inspect clothing and body for ticks upon exiting wooded areas and high brush. Minimize contact with potentially contaminated media. Suspend site activities in the event of inclement weather. Use proper lifting techniques as described on Table 5-1 for mobilization/demobilization.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT  
SOIL BORING AND SUBSURFACE SOIL SAMPLING OPERATIONS  
NAS PENSACOLA, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**SECTION I: General Job Scope**

- I. Work limited to the following (description, area, equipment used): Subsurface soil sample collected via direct push technology or hollow stem auger.
- II. Required Monitoring Instruments: PID with 11.7 eV lamp or FID and Mini-Ram Dust Monitor, if necessary (See Table 5-1)
- III. Field Crew: \_\_\_\_\_
- IV. On-site Inspection conducted  Yes  No Initials of Inspector TtNUS

**SECTION II: General Safety Requirements (To be filled in by permit issuer)**

- V. Protective equipment required
 

|  |  |  |
|--|--|--|
| Level D <input checked="" type="checkbox"/> Level B <input type="checkbox"/> | Respiratory equipment required         |  |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/>            | Full face APR <input type="checkbox"/> | Escape Pack <input type="checkbox"/>     |
| Detailed on Reverse  | Half face APR <input type="checkbox"/> | SCBA <input type="checkbox"/>            |
|  | SAR <input type="checkbox"/>           | Bottle Trailer <input type="checkbox"/>  |
|  | Skid Rig <input type="checkbox"/>      | None <input checked="" type="checkbox"/> |

Modifications/Exceptions: \_\_\_\_\_

| VI. Chemicals of Concern   | Action Level(s)                          | Response Measures  |
|--|--|--|
| <u>VOCs (Benzene Ethylbenzene, Toluene, Trichloroethylene, Xylene, and Methylene Chloride), and PACs Methylnaphthalene and Napthalene.</u> | <u>Sustained above background levels</u> | <u>Evacuate area only investigate when safe levels returned to background Per MSDS</u> |
| _____  | _____                                    | _____  |
| _____  | _____                                    | _____  |

- VII. Additional Safety Equipment/Procedures
 

|  |   |
|--|---|
| Hard-hat..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                        | Hearing Protection (Plugs/Muffs) .... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                 | Safety belt/harness ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No             |
| Chemical/splash goggles ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No        | Radio..... <input type="checkbox"/> Yes <input type="checkbox"/> No                                       |
| Splash Shield..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                   | Barricades ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                                 |
| Splash suits/coveralls ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         | Gloves (Type - Nitrile) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         |
| Steel toe Work shoes or boots..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | Work/rest regimen..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                |
| Chemical Resistant Boot Covers ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Impermeable apron..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                |

Modifications/Exceptions: Reflective vests for high traffic areas. Tyvek coverall if there is a potential for soiling work clothes. PVC or PE coated Tyvek, if saturation or work clothes may occur. The Driller and the driller's helper should wear impermeable aprons to prevent soiling of work clothes when handling auger flights against the body. This can be used if heat stress is an issue. Safety harnesses will be used for activities greater than 6 feet above ground surface without support of safety handrail.

- VIII. Procedure review with permit acceptors
 

|  |   |
|--|---|
| Safety shower/eyewash (Location & Use) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA   | Emergency alarms ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA  |
| Procedure for safe job completion ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA        | Evacuation routes ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA |
| Contractor tools/equipment/PPE inspected ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA | Assembly points..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA    |

- IX. Site Preparation
 

|  |
|--|
| Utility Locating and Excavation Clearance completed ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA    |
| Vehicle and Foot Traffic Routes Cleared and Established..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA |
| Physical Hazards Barricaded and Isolated ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA               |
| Emergency Equipment Staged ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA                             |

- X. Additional Permits required (Utility Locating and Excavation Clearance – Attachment II).....  Yes  No  
*If yes, complete permit required or contact Health Sciences, Pittsburgh Office*

- XI. Special instructions, precautions: Follow safe work practices specified in Section 5.0 of this HASP. Complete an Equipment Inspection Checklist for the Drill Rig upon arrival to the site, and then every 10 day shift thereafter or after major repairs. Test all emergency stop devices initially then periodically to insure operational status. Decontamination of equipment will consist of soap and water wash and rinse with the use of a pressure washer until visibly clean. Personnel decontamination will consist of vacuuming outer garments and soap and water wash and rinse of outer PPE and hands and face prior to breaks or meals.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_



**ATTACHMENT V**  
**MEDICAL DATA SHEET**

### MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all 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 \_\_\_\_\_

Name of Next Kin \_\_\_\_\_

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

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

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

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

Do you have any medical restrictions? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

I am the individual described above. I have read and understand this HASP.

\_\_\_\_\_

Signature

\_\_\_\_\_

Date