

N61165.AR.005001
CNC CHARLESTON
5090.3a

HEALTH AND SAFETY PLAN FOR CONTAMINATION ASSESSMENT CHICORA TANK FARM
CNC CHARLESTON SC
06/01/1999
TETRA TECH INC

Health and Safety Plan
for
Contamination Assessment

**CHARLESTON NAVAL COMPLEX,
CHICORA TANK FARM**
Charleston, South Carolina



Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0105

June 1999

**HEALTH AND SAFETY PLAN
FOR
CONTAMINATION ASSESSMENT**

**CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM
CHARLESTON, SOUTH CAROLINA**

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

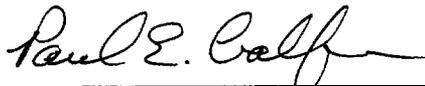
**Submitted to:
Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29419-9010**

**Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220-2745**

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0105**

JUNE 1999

PREPARED UNDER THE SUPERVISION OF:



**PAUL E. CALLIGAN, P. G.
TASK ORDER MANAGER
TETRA TECH NUS, INC.
TALLAHASSEE, FLORIDA**

APPROVED FOR SUBMITTAL BY:



**MATTHEW M. SOLTIS, CIH, CSP
CLEAN HEALTH & SAFETY MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION.....	1-1
1.1 KEY PROJECT PERSONNEL AND ORGANIZATION.....	1-1
1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS.....	1-3
2.0 EMERGENCY ACTION PLAN.....	2-1
2.1 INTRODUCTION	2-1
2.2 PRE-EMERGENCY PLANNING.....	2-1
2.3 EMERGENCY RECOGNITION AND PREVENTION	2-2
2.3.1 Recognition	2-2
2.3.2 Prevention.....	2-3
2.4 EVACUATION ROUTES, PROCEDURES AND PLACES OF REFUGE	2-3
2.5 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT	2-4
2.6 EMERGENCY ALERTING AND ACTION / RESPONSE PROCEDURES	2-8
2.7 PPE AND EMERGENCY EQUIPMENT.....	2-8
2.8 EMERGENCY CONTACTS.....	2-9
2.9 EMERGENCY ROUTE TO HOSPITAL	2-9
3.0 SITE BACKGROUND.....	3-1
3.1 INVESTIGATION AREA	3-1
4.0 SCOPE OF WORK	4-1
5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION.....	5-1
6.0 HAZARD ASSESSMENT	6-1
6.1 CHEMICAL HAZARDS	6-1
6.2 PHYSICAL HAZARDS.....	6-4
6.2.1 Heavy Equipment Hazards	6-4
6.2.2 Energized Systems.....	6-4
6.2.4 Ambient Temperature Extremes.....	6-5
6.3 NATURAL HAZARDS.....	6-5
6.3.1 Insect/Animal Bites and Stings	6-5
6.3.2 Inclement Weather.....	6-6
7.0 AIR MONITORING.....	7-1
7.1 INSTRUMENTS AND USE	7-1
7.1.1 Photoionization Detector and Flame Ionization Detector.....	7-1
7.1.2 Hazard Monitoring Frequency	7-1
7.2 INSTRUMENT MAINTENANCE AND CALIBRATION	7-2

TABLE OF CONTENTS (continued)

<u>SECTION</u>	<u>PAGE</u>
8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS.....	8-1
8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING	8-1
8.1.1 Requirements for TtNUS Personnel	8-1
8.1.2 Requirements for Subcontractors	8-1
8.2 SITE-SPECIFIC TRAINING.....	8-3
8.3 MEDICAL SURVEILLANCE.....	8-3
8.3.1 Medical Surveillance Requirements for TtNUS Personnel	8-3
8.3.2 Medical Surveillance Requirements for Subcontractors	8-5
8.3.3 Requirements for All Field Personnel	8-5
8.4 SUBCONTRACTOR EXCEPTION	8-5
9.0 SPILL CONTAINMENT PROGRAM.....	9-1
9.1 SCOPE AND APPLICATION	9-1
9.2 POTENTIAL SPILL AREAS	9-1
9.2.1 Site Drums/Containers.....	9-1
9.3 LEAK AND SPILL DETECTION.....	9-2
9.4 PERSONNEL TRAINING AND SPILL PREVENTION.....	9-2
9.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT	9-2
9.6 SPILL CONTROL PLAN	9-2
10.0 SITE CONTROL.....	10-1
10.1 EXCLUSION ZONE	10-1
10.1.1 Exclusion Zone Clearance.....	10-1
10.2 CONTAMINATION REDUCTION ZONE	10-2
10.3 SUPPORT ZONE	10-2
10.4 SITE VISITORS	10-2
10.5 SITE SECURITY.....	10-3
10.6 SITE MAPS.....	10-3
10.7 BUDDY SYSTEM.....	10-4
10.8 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS	10-4
10.9 COMMUNICATION.....	10-4
10.10 SAFE WORK PERMITS	10-4
11.0 CONFINED SPACE ENTRY	11-1
12.0 MATERIALS AND DOCUMENTS	12-1
12.1 MATERIALS TO BE POSTED AT THE SITE.....	12-1
13.0 GLOSSARY	13-1

ATTACHMENT I - INJURY/ILLNESS PROCEDURE AND REPORT FORM

ATTACHMENT II – SOP FOR UTILITY LOCATING AND EXCAVATION CLEARANCES

ATTACHMENT III – EQUIPMENT INSPECTION CHECKLIST

ATTACHMENT IV – SAFE WORK PERMITS

TABLES

<u>NUMBER</u>		<u>PAGE</u>
2-1	Emergency Reference.....	2-7
5-1	Tasks/Hazards/Control Measures Compendium	5-3
6-1	Chemical, Physical, and Toxicological Data.....	6-2

FIGURES

<u>NUMBER</u>		<u>PAGE</u>
2-1	Emergency Response Protocol.....	2-5
2-2	Hospital Route Map.....	2-11
7-1	Documentation of Field Calibration	7-3
8-1	Training Letter	8-2
8-2	Site Specific Training Documentation.....	8-4
8-3	Subcontractor Medical Approval Form	8-6
8-4	Medical Surveillance Letter	8-8
10-1	Safe Work Permit	10-6

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide practices and procedures for Tetra Tech NUS, Inc. (TtNUS) and subcontractor personnel engaged in investigatory activities at the Charleston Naval Complex Chicora Tank Farm, in Charleston, South Carolina. This HASP must be used in conjunction with the TtNUS Health and Safety Guidance Manual. Both of these documents must be present at the site during the performance of all site activities.- The Guidance Manual provides detailed information pertaining to the HASP as well as applicable TtNUS Standard Operating Procedures (SOPs). This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard), OSHA's Construction Industry Standards, 29 CFR 1926; and Charleston Naval Complex, procedures and protocol, as they may apply.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards which may be associated with the proposed work at the site. The HASP will be modified, if new information becomes available. All changes to the HASP will be made with the approval of the TtNUS Project Health and Safety Officer (PHSO) and the TtNUS Health and Safety Manager (HSM). Requests for modifications to the HASP will be directed to the PHSO, who will determine, if the changes are necessary. The PHSO will notify the Task Order Manager (TOM), who will notify all affected personnel of changes.

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 all onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

- 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 and tasks to be conducted.
 - 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 Site Safety Officer (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 all aspects of health and safety on site. These duties may include:
 - i. Coordinates all 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 all onsite personnel.
 - ix. Investigates all 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 the CNC-Chicora Tank Farm, the FOL may also be responsible for SSO duties. This action will be performed only as credentials, experience, or the tasks involved permits.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Charleston Naval Complex, Chicora Tank Farm **Client Contact:** Gabriel Magwood
Charleston, South Carolina **Phone Number:** (843) 820-7307
Alternate Contact: Billy Drawey
Phone Number: (843) 743-9985 ext. 29

Scheduled Activities: This activity will be divided into a multi-task operation, including the tasks of soil boring (drilling), monitoring well installation, and multi-media sampling. Further detail on these and other site tasks can be found in Section 4.0 of this HASP.

Dates of scheduled activities: Site activities are expected to begin in July 1999 and continue until project completion.

Project Team:

TtNUS Management Personnel:

Paul E. Calligan, P.G.

TBD

TBD

Matthew M. Soltis, CIH, CSP

Delwyn E. Kubeldis, CIH, CSP

Discipline/Tasks Assigned:

Task Order Manager (TOM)

Field Operations Leader (FOL)

Site Safety Officer (SSO)

CLEAN Health and Safety Manager

Project Health and Safety Officer (PHSO)

Other Potential TtNUS Project Personnel:

TBD

Field Geologist

Non-TtNUS Personnel Affiliation/Discipline/Tasks Assigned

TBD

Drilling subcontractor()

TBD

Analytical Laboratory

Prepared by: Delwyn E. Kubeldis, CIH, CSP

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. All site activities will be coordinated with the client contact, Gabriel Magwood. In the event of an emergency which cannot be mitigated using onsite resources, personnel will evacuate to a safe place of refuge and the appropriate emergency response agencies will be notified. It has been determined that the majority of potential emergency situations would be better supported by outside emergency responders. Based on this determination, TtNUS and subcontractor personnel will not provide emergency response support beyond the capabilities of onsite response. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. CNC-Chicora Tank Farm contacts Gabriel Magwood and Billy Drawey 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, provide the following emergency action measures:

- Initial stage fire fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Initial medical support for injuries or illnesses requiring basic first-aid
- Site control and security measures as necessary

2.2 PRE-EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, emergencies resulting from chemical, physical, or fire hazards are the types of emergencies which could be encountered during site activities.

To minimize and eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating with local Emergency Response personnel to ensure that TtNUS emergency action activities are compatible with existing emergency response procedures. Base Fire Protection and Emergency Services will be notified of scheduled events and activities. This is most imperative in situations where their services may be required.

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

The TtNUS FOL will be responsible for the following tasks:

- Identifying a chain of command for emergency action.

- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.

- Periodically performing practice drills to ensure site workers are familiar with incidental response measures.

- Providing the necessary equipment to safely accomplish identified tasks.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Emergency situations that may be encountered during site activities will generally be recognized by visual observation. Visual observation is primarily relevant for physical hazards that may be associated with the proposed scope of work. Visual observation will also play a role in detecting some chemical hazards. To adequately recognize chemical exposures, site personnel must have a clear knowledge of signs and symptoms of exposure associated with site contaminants. This information is provided in Table 6-1. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended

control methods are discussed in detail in Sections 5.0 and 6.0. Additionally, early recognition of hazards will be supported by periodic site surveys to identify any situation predisposed to an emergency. The FOL and/or the SSO will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Survey findings will be documented by the FOL and/or the SSO in the site logbook, however, all site personnel will be responsible for reporting hazardous situations. Where potential hazards exist, TtNUS will initiate control measures to prevent adverse effects to human health and the environment.

The above actions will provide early recognition for potential emergency situations, and allow TtNUS to instigate necessary control measures. However, if the FOL and the SSO determine that control measures are not sufficient to eliminate the hazard, TtNUS will withdraw from the site and notify the appropriate response agencies listed in Table 2-1.

2.3.2 Prevention

TtNUS and subcontractor personnel will minimize the potential for emergencies by following the Health and Safety Guidance Manual and ensuring compliance with the HASP and applicable OSHA regulations. Periodic site surveys of work areas and correction of any identified deficiencies, prior to the commencement of that day's activities, by the FOL and/or the SSO will also assist in prevention of illness/injuries when hazards are recognized early and control measures initiated.

2.4 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE

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

In the event of an emergency requiring evacuation, all personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification from the TtNUS FOL. Safe places of refuge will be identified prior to the commencement of site activities by the SSO and will be conveyed to personnel as part of the pre-activities briefing session. This information will be reiterated during daily safety meetings and indicated on the Safe Work Permits. Whenever possible, the safe place of refuge will also serve as the

telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the TtNUS FOL or the on-site Incident Commander of the Emergency Response Team. The FOL or the SSO will perform a head count at this location to account for and to confirm the location of all site personnel. Emergency response personnel will be immediately notified of any unaccounted personnel. The FOL or the SSO will document the names of all personnel onsite (on a daily basis) in the site Health and Safety Logbook. This information will be utilized to perform the head count in the event of an emergency.

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

2.5 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. Attachment I provides the procedure to follow when reporting an injury/illness, and the form to be used for this purpose. **If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-1.**

FIGURE 2-1 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 Tetra Tech NUS 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 Continuum Healthcare physician. Continuum Healthcare will contact the medical facility and request specific testing which may be appropriate. The care of the victim will be monitored by Continuum Healthcare physicians. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call Continuum Healthcare at 1-800-229-3674, being 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 MSDS to Continuum Healthcare at (770) 457-1429.
- Contact Corporate Health Sciences Group (Matt Soltis) at 1-800-245-2730.

As environmental data is gathered and the exposure scenario becomes more clearly defined, this information should be forwarded to the Continuum Healthcare Medical Director or Assistant Medical Director.

Continuum Healthcare will compile the results of all 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 Continuum Healthcare.

**FIGURE 2-1 (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 there 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	Chest Tightness / Pressure
Tearing	Nausea / Vomiting
Headache	Dizziness
Cough	Weakness
Shortness of Breath	

Delayed Symptoms:

Weakness	Loss of Appetite
Nausea / Vomiting	Abdominal Pain
Shortness of Breath	Headache
Cough	Numbness / Tingling

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

Burning of eyes, nose, or throat	Nausea / Vomiting
Tearing	Dizziness
Headache	Weakness
Cough	Loss of Appetite
Shortness of Breath	Abdominal Pain
Chest Tightness / Pressure	Numbness / Tingling
Cyanosis	

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-Medicating: _____ Physician Treated: _____

TABLE 2-1

**EMERGENCY REFERENCE
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA**

CONTACT	PHONE NUMBER
EMERGENCY (North Charleston Police, Fire and Ambulance Services) Rescue Services	911 911
PRIMARY HOSPITAL Roper North Hospital (formerly Bakers Hospital)	(843) 745-2787 (Emergency) (843) 744-2110 (Non Emergency)
ALTERNATE HOSPITAL (Downtown Charleston) Charleston Memorial Hospital (This hospital is not as close as Roper North Hospital)	(843) 577-0600
Navy Onsite Representatives at CNC Gabriel Magwood (Remedial Project Manager) Billy Drawey (Environmental Coordinator)	(843) 820-7307 (843) 743-9985 ext. 29
Chemtrec National Response Center Poison Control Center	(800) 424-9300 (800) 424-8802 (800) 962-1253
TtNUS Office on Base FOL (TBD)	TBD
TtNUS, Tallahassee Office	(850) 656-5458
TtNUS, Pittsburgh Office	(412) 921-7090
Health and Safety Contract Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Delwyn E. Kubeldis, CIH, CSP	(412) 921-8529
Task Order Manager Paul E. Calligan, P.G.	(850) 656-5458
Utilities Clearance Billy Drawey, Environmental Coordinator	(843) 743-9985 ext. 29

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

TtNUS personnel may not be working in close proximity to each other at CNC-Chicora Tank Farm. Site personnel will initiate emergency notification to all onsite personnel by radio, hand signals, voice commands, vehicle horns and line of site communication to alert site personnel of an emergency. When project tasks are performed simultaneously on different sites, radios will be used to communicate emergency situations and request assistance.

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

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

HELP	three short blasts	(. . .)
EVACUATION	three long blasts	(- - -)

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

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

- Dial 911 (outside services) and call other pertinent emergency contacts listed in Table 2-1 and report the incident. Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of the incident. Stay on the phone and follow the instructions given by the operator. The operator will then notify and dispatch the proper emergency response agencies.

2.7 PPE AND EMERGENCY EQUIPMENT

A first-aid kit, eye wash units (or bottles of disposable eyewash solution) and fire extinguishers (strategically placed) will be maintained onsite and shall be immediately available for use in the event of an emergency. This equipment will be located in the field office as well as in each site vehicle. At least one first aid kit supplied with equipment to protect against bloodborne pathogens will also be available on

site. Personnel identified within the field crew with bloodborne pathogen and first-aid training will be the only personnel permitted to offer first-aid assistance.

2.8 EMERGENCY CONTACTS

Prior to initiating field activities, all personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to all site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

2.9 EMERGENCY ROUTE TO HOSPITAL

Roper North Hospital will be used for medical care requiring more than basic first aid treatment.

Roper North Hospital
2750 Speissegger Drive
North Charleston, South Carolina 29045
(843) 744-2110
Emergency: (843) 745-2787

Directions to Roper North Hospital from CNC are as follows:

Exit the base by proceeding north on Hobson Avenue to McMillan Avenue. Turn left onto McMillan Avenue and proceed west approximately 1 mile to Rivers Avenue. Turn left onto Rivers Avenue and proceed south approximately 0.5 mile to Cosgrove Avenue. Turn right onto Cosgrove Avenue and proceed south approximately 0.75 mile to Azalea Blvd. Turn left onto Azalea Blvd. and proceed east approximately 1 mile to Baker Hospital Drive. Turn right onto Baker Hospital Drive and proceed south approximately 0.25 mile to Speissegger Drive. Turn right onto Speissegger Drive and proceed to the hospital. The hospital is located at 2750 Speissegger Drive, North Charleston.

A map indicating the travel route from the site to the medical center will be inserted as Figure 2-2.

As soon as possible, Navy contacts Gabriel Magwood and Billy Drawey must be informed of any incident or accident that requires medical attention. Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite. If an exposure to hazardous materials has occurred, provide hazard information from Table 6-1 to medical service personnel.

Figure 2-2 Route to Hospital

3.0 SITE BACKGROUND

3.1 INVESTIGATION AREA

The CNC-Chicora Tank Farm was previously used to store Bunker "C" Fuel, Navy Special Fuel, and Diesel Fuel Marine. The fuel farm is not being used and is in the process of being demolished. A Tank Closure Assessment Report is being developed for submittal to the South Carolina Department of Environmental Controls. During the closure assessment activities, petroleum contamination was discovered along a fuel transfer pipeline while exposing a valve pit to clean the fuel transfer line. A risk-based assessment will be performed to determine the extent of petroleum contamination and evaluate the site for corrective action.

4.0 SCOPE OF WORK

This section describes the project tasks that will be performed at CNC-Chicora Tank Farm. Additionally, each task has been evaluated and the associated hazards and recommended control measures are listed in Table 5-1 of this HASP. The planned activities involved in this effort are presented in detail in the Work Plan developed for the project. If new tasks are to be performed at the site, Table 5-1 and this section will be modified accordingly.

The objective of this field investigation is to determine the extent of petroleum contamination and prepare an Active Corrective Action Plan to remediate the contamination at CNC-Chicora Tank Farm. Specific tasks to be conducted include, but are not necessarily limited to, the following:

- Soil borings (using Direct Push Technology)
- Multi-media sampling (soil and groundwater sampling)
- Monitoring well installation, development, and purging
- Decontamination of sampling and heavy equipment
- IDW management
- Mobilization and demobilization
- Surveying

The above listing represents a summarization of the tasks as they apply to the scope and application of this HASP. For more detailed description of the associated tasks, refer to the Field Sampling Plan (FSP) and/or the Work Plan (WP). If additional tasks are determined to be necessary, this HASP will be amended and a hazard evaluation of the additional tasks performed.

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION

Table 5-1 of this section serves as the primary portion of the site-specific HASP and 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 as well as proper air monitoring techniques.

As discussed earlier, 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 all exclusion zone activities (See Section 10.10) 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.

This page intentionally left blank.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM FOR
CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM, CHARLESTON, SOUTH CAROLINA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
<p>Soil borings using Direct-Push Technology (DPT, such as the Geoprobe®). This task also includes monitoring well installation, development, and purging.</p>	<p>Chemical hazards:</p> <p>1) Primary types of contaminants include diesel fuel, heating oil, and waste oil products (specifically VOC components xylene, and naphthalene) and SVOCs (including general PAHs). Note that these contaminants may be bound to particulates (dusts, soils, etc.) and contact should be avoided whenever possible. See Table 6-1 for more information on the chemicals of concern.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Heavy equipment hazards (pinch/compression points, rotating equipment, 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) Slip, trips, and falls</p> <p>8) Vehicular and foot traffic</p> <p>9) Ambient temperature extremes (heat stress)</p> <p>Natural hazards:</p> <p>10) Insect/animal bites and stings</p> <p>11) Inclement weather – electrical storms</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, termination of activities may be used to minimize exposure to excessive airborne dusts.</p> <p>2) Decontaminate all equipment and supplies between boreholes and prior to leaving the site.</p> <p>3) All equipment to be used will be</p> <ul style="list-style-type: none"> - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600, .601, .602), and manufacturers design and documented as such using Equipment Inspection Sheet (see Attachment III of this HASP). - Operated by knowledgeable operators and ground crew. - Only manufacturer approved equipment may be used in conjunction with equipment repair procedures <p>In addition to the equipment considerations, the following standard operating procedures will be employed:</p> <ul style="list-style-type: none"> - All personnel not directly supporting the direct push operation will remain at least 25 feet from the point of operation. - All loose clothing/protective equipment will be secured to avoid possible entanglement. - Hand signals will be established prior to the commencement of direct push activities. - A remote sampling device must be used to sample drill cuttings near rotating tools. - Work areas will be kept clear of clutter. - All 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 insure its operational status. - Areas will be inspected prior to the movement of direct push rigs and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. <p>4) Hearing protection will be used during all subsurface activities.</p> <p>5) All intrusive activities will be conducted consistent with the TtNUS "Utility Locating and Excavating Clearance" included as Attachment II. All utility clearances shall be obtained, in writing, prior to subsurface activities (contact Billy Draway at CFO office). Prior to any subsurface investigations, the locations of all underground utilities will be identified and marked.</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) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"> - Establish safe zones of approach (i.e. Boom + 3 feet). - Secure all loose articles to avoid possible entanglement. - All equipment shall be equipped with movement warning systems. - All activities are to be conducted consistent with the Base requirements. <p>9) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat stress concerns is provided in Section 4 of the TtNUS Health and Safety Guidance Manual.</p> <p>10) Avoid nesting areas, use repellents. The use of repellants including types and ingredients lists should be reported to the FOL. Report potential hazards to the SSO. Follow guidance presented in Attachment II of this HASP.</p> <p>11) All work will be terminated in the event of an electrical storm.</p>	<p>It is anticipated that potential contaminant concentrations at outdoor sample locations will not present an inhalation hazard.</p> <p>A direct reading Photoionization Detector (PID) with at least a 10.0 eV lamp, or Flameionization Detector (FID), will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the borehole 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"> - Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above 10 ppm in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to report to an unaffected area. - Work may only resume if airborne readings in worker breathing zone return to below 10 ppm levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection. <p>Site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. Generation of dusts should be minimized to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be performed by observing work conditions for visible dust clouds. Potential exposure to contaminated dust will be controlled using water suppression, by avoiding dust plumes, or evacuating the operation area until dust subsides, or area wetting to control dusts are completed.</p>	<p>All subsurface operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - Safety glasses - Hardhat - Reflective vest for traffic areas - Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential exists for soiling work attire. - Nitrile gloves or leather gloves with surgical style inner gloves - Hearing protection during drilling or for other high noise areas as directed by the SSO. <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></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>Personnel Decontamination - Will consist of a soap/water wash and rinse for reusable protective equipment (e.g., gloves). This function will take place at an area adjacent to the drilling operations bordering the support zone.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of reusable outer gloves, - Outer coveralls, boot covers, and/or outer glove removal as applicable - Removal, segregation, and disposal of non-reusable PPE in bags/containers provided - Wash hands and face, leave contamination reduction zone. - Examine for ticks if sampling occurs in remote locations.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM FOR
CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM, CHARLESTON, SOUTH CAROLINA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
<p>Multi-media sampling, including soil and groundwater sampling.</p>	<p>Chemical hazards:</p> <p>1) Primary types of contaminants include diesel fuel, heating oil, and waste oil products (specifically VOC components, xylene, and naphthalene) and SVOCs (including general PAHs). Note that these contaminants may be bound to particulates (dusts, soils, etc.) and contact should be avoided whenever possible. See Table 6-1 for more information on the chemicals of concern.</p> <p>2) Transfer of contamination into clean areas</p> <p>Physical hazards:</p> <p>3) Noise in excess of 85 dBA 4) Lifting (strain/muscle pulls) 5) Pinches and compressions 6) Slip, trips, and falls 7) Ambient temperature extremes (heat stress) 8) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>9) Insect/animal bites and stings</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, termination of activities may be used to minimize exposure to observed airborne dusts.</p> <p>2) Decontaminate all equipment and supplies between sampling locations and prior to leaving the site.</p> <p>3) When sampling at the Geoprobe rig use hearing protection. The use of hearing protection outside of 25 feet from the Geoprobe rig should be incorporated under the following condition:</p> <p align="center">If you have to raise your voice to talk to someone who is within 2 feet of your location, hearing protection must be worn.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>5) Keep any machine guarding in place. Avoid moving parts. Use tools or equipment where necessary to avoid contacting pinch points.</p> <ul style="list-style-type: none"> - The equipment operator shall shutdown machinery if the sampler is near moving machinery parts. <p>6) Preview work locations for unstable/uneven terrain.</p> <p>7) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is provided in Section 4.0 of the TNUS Health and Safety Guidance Manual.</p> <p>8) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"> - Establish safe zones of approach (i.e. Boom + 3 feet). - All equipment shall be equipped with movement warning systems. - All activities are to be conducted consistent with the Base requirements. <p>9) Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Attachment II of this HASP.</p>	<p>It is anticipated that potential contaminant concentrations at outdoor sample locations will not present an inhalation hazard.</p> <p>A direct reading Photoionization Detector (PID) with at least a 10.0 eV lamp, or Flameionization Detector (FID), will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the borehole 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"> - Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above 10 ppm in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to report to an unaffected area. - Work may only resume if airborne readings in worker breathing zone return to below 10 ppm levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection. <p>Site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. Generation of dusts should be minimized to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be performed by observing work conditions for visible dust clouds. Potential exposure to contaminated dust will be controlled using water suppression, by avoiding dust plumes, or evacuating the operation area until dust subsides.</p>	<p>Level D protection will be utilized for the initiation of all sampling activities.</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (steel toe/shank) - Safety glasses - Surgical style gloves (double-layered if necessary) - Reflective vest for high traffic areas - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i> - <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i> <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></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>Personnel Decontamination will consist of a removal and disposal of non-reusable PPE (gloves, coveralls, etc., as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of:</p> <ul style="list-style-type: none"> - Equipment drop - Outer coveralls, boot covers, and/or outer glove removal (as applicable) - Removal, segregation, and disposal of non-reusable PPE in bags/containers provided - Soap/water wash and rinse of reusable PPE (e.g., hardhat) if potentially contaminated - Wash hands and face, leave contamination reduction zone. - Examine for ticks if sampling occurs in remote locations.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM FOR
CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM, CHARLESTON, SOUTH CAROLINA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
Mobilization/ Demobilization	<p>Physical hazards:</p> <ol style="list-style-type: none"> Lifting (strain/muscle pulls) Pinches and compressions Slip, trips, and falls Heavy equipment hazards (rotating equipment, hydraulic lines, etc.) Vehicular and foot traffic Ambient temperature extremes (heat stress) <p>Natural hazards:</p> <ol style="list-style-type: none"> Insect/animal bites and stings 	<ol style="list-style-type: none"> Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. Keep any machine guarding in place. Avoid moving parts. Use tools or equipment where necessary to avoid contacting pinch points. Preview work locations for unstable/uneven terrain. All equipment will be <ul style="list-style-type: none"> Inspected in accordance with OSHA, and manufacturer's design. Operated by knowledgeable operators, and knowledgeable ground crew. Traffic and equipment considerations are to include the following: <ul style="list-style-type: none"> Establish safe zones of approach. Secure all loose articles to avoid possible entanglement. All equipment shall be equipped with movement warning systems. All activities are to be conducted consistent with the Base requirements. Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is provided in Section 4.0 of the TINUS Health and Safety Guidance Manual. Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Attachment II of this HASP. 	Not required	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> Standard field attire (Sleeved shirt; long pants) Safety shoes (Steel toe/shank) Safety glasses Hardhat (when overhead hazards exists, or identified as a operation requirement) Reflective vest for high traffic areas Hearing protection for high noise areas, or as directed on an operation by operation scenario. <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></p>	Not required
Decontamination of Sampling and Heavy Equipment	<p>Chemical hazards:</p> <ol style="list-style-type: none"> Primary types of contaminants include diesel fuel, heating oil, and waste oil products (specifically VOC components xylene, and naphthalene) and SVOCs (including general PAHs). Note that these contaminants may be bound to particulates (dusts, soils, etc.) and contact should be avoided whenever possible. None of the site contaminants, however, are anticipated to be present in significant concentrations to present an inhalation hazard. See Table 6-1 for more information on the chemicals of concern. Decontamination fluids - Liquinox (detergent), and isopropanol <p>Physical hazards</p> <ol style="list-style-type: none"> Lifting (strain/muscle pulls) Noise in excess of 85 dBA Flying projectiles Vehicular and foot traffic Ambient temperature extremes (heat stress) Slips, trips, and falls 	<ol style="list-style-type: none"> and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Obtain manufacturer's MSDS for any decontamination solvents used onsite. Use appropriate PPE as identified on MSDS. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication section of the Health and Safety Guidance Manual (Section 5). Use multiple persons where necessary for lifting and handling sampling equipment for decontamination purposes. Wear hearing protection when operating pressure washer. Use eye and face protective equipment when operating pressure washer. All other personnel must be restricted from the area. Traffic and equipment considerations are to include the following: <ul style="list-style-type: none"> Establish safe zones of approach. All equipment shall be equipped with movement warning systems. All activities are to be conducted consistent with the Base requirements. Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is provided in Section 4.0 of the TINUS Health and Safety Guidance Manual. Preview work locations for unstable/uneven terrain. 	Use visual observation, and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried. After decon is completed, screen equipment with a PID/FID. If any elevated readings (i.e., above background) are observed, perform decon again and rescreen. Repeat until no elevated PID/FID readings are noted.	<p>For Heavy Equipment: This applies to high pressure soap/water, steam cleaning wash and rinse procedures.</p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> Standard field attire (Long sleeve shirt; long pants) Safety shoes (Steel toe/shank) Chemical resistant boot covers Nitrile outer gloves Hearing protection (plugs or muffs) PVC Rainsuits or PE or PVC coated Tyvek Safety glasses underneath a splash shield <p><i>Items in italics are at the discretion of the SSO.</i></p> <p>For sampling equipment (trowels, MacroCore Samplers, bailers, etc.), the following PPE is required</p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> Standard field attire (Long sleeve shirt; long pants) Safety shoes (Steel toe/shank) Nitrile outer gloves Safety glasses <p>In the event of overspray of chemical decontamination fluids employ PVC Rainsuits or PE or PVC coated Tyvek as necessary.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of:</p> <ul style="list-style-type: none"> Equipment drop Soap/water wash and rinse of outer boots and gloves, as applicable Soap/water wash and rinse of the outer splash suit, as applicable Disposable PPE will be removed and bagged. <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure PPE to control exposures to potentially contaminated media (e.g. air, water, soils).</p> <ol style="list-style-type: none"> Decontaminate all equipment if they become contaminated between locations and prior to leaving the site. Wheels/tires sprayed off as necessary at each work location, as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity. <p>Sampling Equipment Decontamination</p> <p>Sampling equipment will be decontaminated as per the requirements in the Sampling and Analysis Plan and/or Work Plan.</p> <p>MSDS for any decon solutions (Alconox, isopropanol, etc.) will be obtained and used to determine proper handling / disposal methods and protective measures (PPE, first-aid, etc.).</p> <p>All 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 onsite and leaving the site. No equipment will be authorized access or exit without this evaluation.</p> <p>Evaluation of equipment arriving and leaving the site will be documented on the Equipment Inspection Checklist, Attachment III.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM FOR
CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM, CHARLESTON, SOUTH CAROLINA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
IDW management and moving IDW drums to storage areas	<p>Chemical hazards:</p> <p>1) Primary types of contaminants include diesel fuel, heating oil, and waste oil products (specifically VOC components xylene, and naphthalene) and SVOCs (including general PAHs). Note that these contaminants may be bound to particulates (dusts, soils, etc.) and contact should be avoided whenever possible. None of the site contaminants, however, are anticipated to be present in significant concentrations to present an inhalation hazard. See Table 6-1 for more information on the chemicals of concern.</p> <p>2) Transfer of contamination into clean areas</p> <p>Physical hazards:</p> <p>3) Noise in excess of 85 dBA 4) Lifting (strain/muscle pulls) 5) Pinches and compressions 6) Slip, trips, and falls 7) Vehicular and foot traffic 8) Ambient temperature extremes (heat stress)</p> <p>Natural hazards:</p> <p>9) Insect/animal bites and stings</p>	<p>1) Should a container rupture during relocation or if there is a necessity to open a container. Employ real-time monitoring instrumentation, action levels, and identify PPE to control exposures to potentially contaminated media (e.g. air, water, soils). - Ensure proper labeling of all containers.</p> <p>2) Decontaminate all equipment and, if they become contaminated, and prior to staging.</p> <p>When staging containers - 4 drums to a pallet label and retention ring bolts facing out. - Minimum of 3 feet between rows. - Maintain drum inventory</p> <p>1) media/site obtained from 2) Date filled 3) Volume</p> <p>3) When working near heavy equipment, use hearing protection.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>5) Keep any machine guarding in place. Avoid moving parts. Use tools or equipment where necessary to avoid contacting pinch points.</p> <p>6) Preview work locations for unstable/uneven terrain.</p> <p>7) Traffic and equipment considerations are to include the following: - Establish safe zones of approach. - All equipment shall be equipped with movement warning systems. - All activities are to be conducted consistent with the Base requirements.</p> <p>8) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is provided in Section 4.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>9) Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Attachment II of this HASP.</p>	<p>It is anticipated that potential contaminant concentrations at the drum and vessel storage locations will not present an inhalation hazard unless a container ruptures/leaking or is opened.</p> <p>A direct reading Photoionization Detector (PID) with at least a 10.0 eV lamp, or Flameionization Detector (FID), will be used to screen samples and to detect the presence of any potential volatile organics. Source and downwind monitoring will be conducted. 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"> - Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above 10 ppm in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to report to an unaffected area. - Work may only resume if airborne readings in worker breathing zone return to below 10 ppm levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection. <p>Site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. Generation of dusts should be minimized to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be performed by observing work conditions for visible dust clouds. Potential exposure to contaminated dust will be controlled using water suppression, by avoiding dust plumes, or evacuating the operation area until dust subsides.</p>	<p>Level D protection will be utilized for the initiation of all sampling activities.</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (sleeved shirt; long pants) - Nitrile or cotton/leather work gloves with surgical style inner gloves - Safety shoes (steel toe/shank) - Safety glasses - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Reflective vest for high traffic areas</i> - <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i> - <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i> <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of:</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer boots and gloves, as applicable - Soap/water wash and rinse of the outer splash suit, as applicable - Disposable PPE will be removed and bagged. - Wash hands and face and leave the contamination reduction zone.
Site Surveying Applicable at all sites within the installation	<p>Physical hazards:</p> <p>1) Lifting (muscle strains and pulls) 2) Slip, trips, and falls 3) Vehicular traffic</p>	<p>1) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>2) Preview work locations for unstable/uneven terrain. Maintain a minimum of two feet from unstable embankments.</p> <p>3) Surveying activities conducted in high traffic areas will require the use of reflective vests and warning signs to inform motorists of the work activity to proceed with caution. Access to all site locations will be coordinated through the FOL.</p>	Not required	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (sleeved shirt; long pants) - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i> <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></p>	Not required

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards anticipated to be present during the activities to be conducted. Table 6-1 provides information related to chemical constituents that have been identified by analysis or are suspected to be present at the site based on historical data. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data are discussed in the table.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with CNC-Chicora Tank Farm include inhalation, ingestion, and dermal contact of various contaminants that may be present in shallow and deep soils and groundwater. The focus of this field investigation is to conduct additional sampling of various media at these associated sites. Therefore, the concentrations of the chemical hazards present are not fully determined. Based on prior activities at the site; however, the types of contaminants anticipated include heating and diesel fuels. The following have been identified as the primary classes of hazards for these contaminants:

- Volatile Organic Compounds (VOCs) from petroleum products, specifically naphthalene
- SVOCs, including general PAHs, waste oils, and diesel fuel

Table 6-1 provides information on the individual substances likely to be present at the sites of concern. 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. Exposure via inhalation is not anticipated during the planned scope of work.

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM
CHARLESTON, SOUTH CAROLINA**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Diesel Fuel No.2-D	Mixture	Components of this substance will be detected readily; however, no documentation exists as to the relative response ratio of either PID or FID.	Air sampling use charcoal tube as a collection media; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with NIOSH Method #1550.	OSHA; NIOSH; ACGIH; 5 mg/m ³ as mineral oil mist. In addition NIOSH and ACGIH establish 10 mg/m ³ as a STEL.	Kerosene odor Recommended air-purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <300-550°F; 149-288°C Melting Pt: Not available Solubility: Negligible Flash Pt: 95-145°F; 35-62°C Autoignition: 475°F, 246°C LEL/LFL: 0.6% UEL/UFL: 8.0% Vapor Density: >5 Vapor Pressure: <0.1 mmHg @ 70°F; 21°C Specific Gravity: 0.80 Incompatibilities: strong oxidizers, halogens, and hypochlorites Appearance and odor: Colorless to amber with a kerosene odor	Prolonged or repeated exposures to this product may cause skin and eye irritation. Because of the defatting capabilities, this exposure may lead to a dermatitis condition. High vapor concentrations are irritating to the eyes and respiratory tract. Exposure to high airborne concentrations may result in narcotic effects, including dizziness, headaches, and anesthetic capabilities leading to unconsciousness. High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation.
Naphthalene	91-20-3	PID: I.P 8.12 eV, relative response ratio unknown. No information was found as to the relative response for the FID, however it is certain it is detectable at a high response.	Air sample using charcoal tube and carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method # 35 or NIOSH Method #1501	OSHA; ACGIH; NIOSH; 10 ppm NIOSH; ACGIH; have established an STEL of 15 ppm. IDLH: 250 ppm	Respiratory Protection: Warning Property - Odor threshold 0.38 ppm, Adequate- Use an air purifying respirator with organic vapor cartridges for concentrations up to 250 ppm. Recommended gloves: Nitrile - >6.00 hrs; Neoprene - >6.00 hrs;	Boiling Pt: 424°F; 218°C Melting Pt: 176°F; 80°C Solubility: 0.003% Flash Pt: 174°F; -79°C LEL/LFL: 0.9% UEL/UFL: 5.9% Vapor Density: Not available Vapor Pressure: 1 mmHg Specific Gravity: 1.15 Incompatibilities: Strong oxidizers, chromic anhydride Appearance and Odor: Colorless to brown solid with an odor of mothballs	Overexposure 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 failure (kidney shutdown), and dermatitis. Prolonged or chronic exposure may further cause optical neuritis, and corneal damage. Target organs area listed as eyes, blood, cells, and central nervous system.
Waste Oils All information is based on mineral oil	Mixture 8012-95-1 for mineral oil	Varies between fractions however waste oils tend to be less volatile. The FID tends to handle the longer chained aliphatic hydrocarbons more efficiently than its PID counterpart and would be selected as the instrument of choice.	Sampling and analytical protocol shall be in accordance with NIOSH Method #5026 (the recommended method for mineral oil mist).	ACGIH; NIOSH; 5 mg/m ³ (oil mists); 10 mg/m ³ STEL. OSHA; 5 mg/m ³ (Oil mists)	Respiratory Protection: Non-volatile substance, therefore no respiratory protection is required. In an aerosol form, dust and mist respirator would be considered acceptable for up to 500 mg/m ³ . Recommended gloves: Any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances, and will be acceptable). Natural rubber gloves should be avoided. Recommended gloves: Nitrile	Boiling Pt: 680°F; 360°C Melting Pt: Not available Solubility: Insoluble Flash Pt: 275-500°F; 135-260°C depends on the distillation fraction LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: <0.5 mmHg Specific Gravity: 0.90 Incompatibilities: None reported Appearance and odor: Colorless, oily, with an odor of burned lubricating oil.	Minor irritation to the eyes, skin, and respiratory system.

**TABLE 6-1
 CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
 CHARLESTON NAVAL COMPLEX, CHICORA TANK FARM
 PAGE 2**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
General PAHs / Coal Tar Pitch Volatiles / Creosote / cresol (Fluoranthene, pyrene, benzo(a)anthracene, benzo(a)pyrene, benzo(f)fluoranthene, benzo(k)fluoranthene), etc.)	(CAS Numbers vary depending on specific compound)	PID: I.P. of 8.97 eV, relative response ratio unknown. FID: Response factor unknown but given the substances flammability, detection by FID can be anticipated.	Refer to NIOSH methods for each specific compound for appropriate air sampling protocols. Many PAHs can be sampled using NIOSH Method 5506 or 5515 - Teflon filter with support ring - High pressure liquid chromatography with UV detector. For cresol (a major constituent of creosote) by silica gel or xad-7 sorbent tube; Acetone desorption and analysis by gas chromatography - flame ionization detector or high-pressure liquid chromatography. (NIOSH Method #2001, or OSHA Method #32)	General PAHs: Most PAHs have no established exposure limits. Coal Tar Pitch Volatiles / PAHs (including chrysene and benzo(a)pyrene) have an exposure limit of 0.2 mg/m ³ (OSHA and ACGIH). 0.1 mg/m ³ - (NIOSH) Creosote / Cresol: OSHA; ACGIH: 5 ppm NIOSH: 2.3 ppm IDLH: 80 mg/m ³	Adequate - use a full-face air-purifying respirator with organic vapor / dust/mist cartridge up to 250 ppm. Cresol has an Odor Threshold of 0.00005-0.0079 ppm. Recommended gloves: Viton >96.00 hrs; butyl rubber >90.00 hrs; neoprene >4.50 hrs	Properties of various PAHs/Coal Tar Pitch Volatiles vary depending upon the specific compound. <i>For Creosote/Cresol:</i> Boiling Pt: 376-397°F; 191-203°C Melting Pt: 52-96°F; 10.9-35.5°C Solubility: Insoluble Flash Pt: 178°F; 81°C LEL/LFL: Not available UEL/UFL: Not available Vapor Density: 3.72 Vapor Pressure: 1 mmHg @ 100-127° F; 38-53°C Specific Gravity: 1.030-1.038 Incompatibilities: Nitric acid, oleum, chlorosulfonic acid, oxidizers Appearance and Odor: Yellowish or colorless, flammable, oily liquid (often brownish because of impurities or oxidation)	Regulated based on effects on respiratory tract and skin irritation. Other effects may include eye irritation and central nervous system, disturbances. Acute exposures may result in difficulty breathing, respiratory failure and skin and eye irritation and burns. Chronic exposure may damage the liver, kidneys, lungs and skin. Skin exposure may result in photosensitivity. IARC, NTP, NIOSH, ACGIH, and the EPA list some PAHs such as benzo(a)pyrene as a potential carcinogen (ARC 2A, NTP-2, ACGIH TLV-A2, NIOSH-X, EPA-B2).

6.2 PHYSICAL HAZARDS

The physical hazards that may be present during the performance of site activities are summarized below:

- 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 hazard 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 thoroughly discuss safe drilling procedures during the pre-activities training session. All site personnel will sign the form in Figure 8-2 documenting that they received the training and understand the procedures. The following rules will apply to all drilling operations:

- Any direct push rig equipped with emergency stop devices will have the devices tested daily to ensure that they are operational.
- The driller may not leave the controls when the augers are rotating.

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 in areas of intrusive and ground-level activities. **All drilling activities will be conducted consistent with the TtNUS Standard Operating Procedure "Utility Locating and Excavation Clearance (HS-1.0)".** Also, activities which may contact aboveground (e.g., overhead) utilities must follow this SOP. A copy of this SOP is included as Attachment II. Clearance of underground and

overhead utilities for each sample location will be coordinated with CNC-Chicora Tank Farm personnel. Billy Drawey is the point of contact for utility clearance and can be reached at (843) 743-9985 ext. 29. Whenever underground utilities are suspected to be close to subsurface sampling locations, the borehole will be advanced with a hand auger prior to drilling (see Attachment II for specific depth of hand auger). As built drawings may also be utilized for additional clarification. In certain cases, Base personnel may need to deenergize electrical sources using facility lockout/tagout procedures to insure electrical hazards are eliminated.

6.2.3 Ambient Temperature Extremes

Overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. Extremely cold temperatures are not expected to be encountered due to project location. Work performed while employing PPE when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke). This is dependent on variables such as wind speed, humidity, and amount of direct sunlight, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, work load 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 Section 4.0 of the Health & Safety Guidance Manual, work-rest regimens will be noted on the Safe Work Permits. The SSO will recommend additional heat stress control measures as they are deemed necessary as per ACGIH guidelines.

6.3 NATURAL HAZARDS

6.3.1 Insect/Animal Bites and Stings

During warm months (spring through early fall), tick-borne Lyme Disease may pose a potential health hazard. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots). 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. Provide control measure or location where it may be found

Contact with poisonous plants and bites or stings from poisonous insects are other natural hazards, which must be considered. Long pants (tucked into boots), and avoiding potential nesting areas will minimize the

hazards of exposure. 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.

6.3.2 Inclement Weather

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

7.0 AIR MONITORING

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 10.0 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 has been selected because it is capable of detecting the organic and inorganic vapors or gases of concern (NOTE: A Flame Ionization Detector [FID] may be used as an alternative to the PID).

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 which 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 all 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). All 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 all of 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

All TtNUS personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at CNC-Chicora Tank Farm. Additionally, TtNUS personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training within the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site supervisory personnel.

Documentation of 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.

TtNUS will conduct site-specific training session prior to initiating site work. Additionally, a brief meeting will be held daily to discuss operations planned for that day. At the end of the workday, a short meeting will be held to discuss the operations completed and any problems encountered. This activity will be supported through the use of a Safe Work Permit System (See Section 10.10).

8.1.2 Requirements for Subcontractors

All 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) and 8 hours of refresher training meeting the requirements of 29 CFR 1910.120(e)(8) prior to performing field work at CNC-Chicora Tank Farm. 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 in Figure 8-1 and by providing copies of certificates for all subcontractor personnel participating in site activities.

FIGURE 8-1
TRAINING LETTER

The following statements must be typed on company letterhead, 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. Paul E. Calligan, P. G.
Task Order Manager
Tetra Tech NUS, Inc.
1401 Oven Park Drive, Suite 102
Tallahassee, Florida 32312

Subject: HAZWOPER Training for CNC-Chicora Tank Farm, Charleston South Carolina

Dear Mr. Calligan:

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 all 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 an 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 hours 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)

8.2 SITE-SPECIFIC TRAINING

TtNUS will provide site-specific training to all site personnel who will perform work on this project. Site-specific training will also be provided to all personnel [U.S. Department of Defense (DOD), 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 on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- 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)
- Spill response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Use and application of the Safe Work Permit

Site-specific documentation will be established through the use of Figure 8-2. All 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

All 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 on the job site.

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 can 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" with a letter, on company letterhead, containing all of the information in the example letter presented in Figure 8-4 of this HASP.

8.3.3 Requirements for All 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 presented in Section 7.0 of the 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.

**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 was found to be medically -

- Qualified to perform work at the CNC-Chicora Tank Farm work site
- Not qualified to perform work at the CNC-Chicora Tank Farm work site

and,

2. Undergone a physical examination in accordance with OSHA 29 CFR 1910.134(b)(10) and was 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 that 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 CNC-Chicora Tank Farm 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. Paul E. Calligan, P.G.
Task Order Manager
Tetra Tech NUS, Inc.
1401 Oven Park Drive, Suite 102
Tallahassee, Florida 32312

Subject: Medical Surveillance for CNC-Chicora Tank Farm, Charleston, South Carolina

Dear Mr. Calligan:

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: Final Rule." 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 licensed 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 CNC-Chicora Tank Farm, South Carolina site.

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)

9.0 SPILL CONTAINMENT PROGRAM

9.1 SCOPE AND APPLICATION

It is anticipated that quantities of bulk potentially hazardous materials (greater than 55-gallons) may be handled during some of the site activities conducted as part of the scope of work. Significant quantities of waste water (decontamination, purge and development) and Investigative-Derived Wastes (IDW) may be generated as part of site activities. It is not anticipated, however, that spillage of these materials would constitute a significant danger to human health or the environment. Further, it is possible that as the job progresses disposable PPE and other non-reusable items may be generated. As needed, 55 -gallon drums will be used to contain waste waters, IDW, and other unwanted items generated during investigatory activities. These drums will be labeled with the site name and address, the type of contents, and the date the container was filled as well as an identified contact person. Samples will be collected and analyzed to characterize the material and determine appropriate disposal measures. Once characterized they can be removed from the staging area and disposed of in accordance with Federal, State, and local regulations. Table 5-1 contains detailed information about handling IDW at CNC-Chicora Tank Farm.

9.2 POTENTIAL SPILL AREAS

Potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, there are various areas vulnerable to this hazard including the areas used for central staging and decontamination activities. Additionally, areas designated for handling, loading, and unloading of potentially contaminated soils, waters, and debris present limited potential for leaks or spills. It is anticipated that all IDW generated as a result of this scope of work will be containerized, labeled, and staged to await chemical analyses. The results of these analyses will determine appropriate disposal methods.

9.2.1 Site Drums/Containers

All drums/containers used for containing soils liquids and PPE will be sealed, labeled, and staged within a centralized area awaiting shipment or disposal. Drums will be arranged as outlined below:

- All drums will be segregated according to their content (soil, decon fluids, used PPE, etc.)
- Drums will be placed on pallets with no more than four drums to a pallet.

- Each row of drums will be separated by a three foot space to allow travel between the rows of drums.
- The drum storage area will be segregated and cordoned off with barrier tape and traffic cones.

9.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, periodic inspections by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is detected, the first approach will be to transfer the container contents using a hand pump or other mechanism into a new container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, or sand, which will be stored at the staging area in a conspicuously marked drum. This material too, will be containerized for disposal pending analyses. All inspections will be documented in the Project Logbook.

9.4 PERSONNEL TRAINING AND SPILL PREVENTION

All personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

9.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

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

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry);
- Drums (55-gallon U.N. 1A1 or 1A2)
- Shovels, rakes, and brooms
- Labels

9.6 SPILL CONTROL PLAN

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

- 1) Notify the SSO or FOL immediately, of a leak or spill.

- 2) Employ the personnel protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the drum or raising the leak to the highest point. Spread the absorbent material in the area of the spill covering completely.
- 3) Transfer the material to a new container, collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment or disposal options.
- 4) All spills will be recontainerized with 2-inches of top cover, and await test results for treatment or disposal options.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur; however, notification of appropriate emergency response agencies will be carried out by the FOL or SSO.

10.0 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. This three-zone approach will utilize an Exclusion Zone, a Contamination Reduction Zone (CRZ), and a 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 the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

10.1 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 present 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 soil boring or sampling operations. Furthermore, once intrusive 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 CRZ. Therefore, the Exclusion Zones for this project will be limited to those areas of the site where active work is being performed plus a designated area surrounding the point of operation (see Table 5-1 for specific operation). When possible and warranted, Exclusion Zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform site personnel.

10.1.1 Exclusion Zone Clearance

Prior to the initiation of site activities, utility locations will be identified by utility companies contacted through Billy Drawey (the Environmental Coordinator) at (843) 743-9985, extension 29. Additional utility surveys may be conducted by TtNUS through the use of available documentation provided by CNC-Chicora Tank Farm and/or local utility companies. The positions of identified utilities will be field located and staked to minimize the potential for damage during intrusive activities. Sample locations can be located to avoid buried utilities. In the event that a utility is struck during a subsurface investigative activity, the emergency numbers provided in Table 2-1 will be notified.

Access to work areas will be controlled by TtNUS personnel. No personnel will be permitted to enter site Exclusion Zones without training and Medical Surveillance as specified in Section 8.0 of this HASP during

active operations. Site visitors will be provided site-specific training and will be escorted by TtNUS personnel at all times (see section 10.4).

10.2 CONTAMINATION REDUCTION ZONE

The CRZ will be a buffer area between the Exclusion Zone and any area of the site where contamination is not suspected. The personnel and equipment decontamination will not take place in this area, but will take place at a central location established for this project. This area instead will serve as a focal point in supporting exclusion zone activities. When applicable, this area will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility personnel.

10.3 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. In all cases, 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.

10.4 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 (EPA, OSHA, etc.)
- CNC-Chicora Tank Farm personnel
- Other authorized visitors

All personnel working on this project are required to gain initial access to the site by coordinating with the TtNUS FOL or designee and following established site access procedures.

Upon gaining access to the site, all site visitors wishing to observe operations in progress will be escorted by a TtNUS representative (arranged for by the FOL) and shall be required to meet the minimum requirements discussed below:

- All site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.
- All site visitors will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training (40-hours of HAZWOPER training) and medical surveillance as stipulated in Section 8.0 of this document. In addition, to enter the site operational zones during planned activities, all visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Once the site visitors have completed the above items, they will be permitted to enter the operational zone. All visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Any and all visitors not meeting the requirements stipulated in this plan will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the termination of all onsite activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from the FOL, SSO or on-site security personnel.

10.5 SITE SECURITY

Site security will be accomplished using existing base security resources and procedures, supplemented by TtNUS or subcontractor personnel, if necessary. TtNUS will retain control over active operational areas. The first line of security will take place at the base boundaries restricting the general public. The second line of security will take place at the work site referring interested parties to the FOL. The FOL will serve as a focal point for site personnel, and will serve as the final line of security and the primary enforcement contact.

10.6 SITE MAPS

Once the areas of contamination, access routes, utilities, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. These maps will show utility locations, potential points of contact with the public, roadways, and other significant characteristics that may impact site operations and safety. Site maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

10.7 BUDDY SYSTEM

Personnel engaged in onsite activities will practice the "buddy system" to ensure the safety during this operation.

10.8 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

TtNUS and subcontractor personnel will provide MSDSs for all 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 all chemicals used on site will be developed using Section 5.0 of the Health and Safety Guidance Manual. The MSDSs will then be maintained in a central location and will be available for anyone to review upon request.

10.9 COMMUNICATION

Since the project site is not confined to a single discrete area, personnel are expected to be working apart during field activities. Therefore, two-way radio communication is deemed necessary.

External communication will be accomplished by using the telephones at predetermined and approved locations or through cellular phones. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities at the base, the FOL will determine and arrange for telephone communications, if it is determined a cellular means will not be used.

10.10 SAFE WORK PERMITS

All 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 10-1. Partially completed Permits for Exclusion Zone tasks are included as Attachment IV of this HASP. These work permits will be further supported by the daily meetings conducted during their generation. This effort will ensure all site-specific considerations and changing conditions are incorporated into the planning effort.

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.

The FOL and/or the SSO will be responsible for completing the Safe Work Permit and issuing them to the appropriate parties. Site personnel at the end of each days activity will turn in the permit(s) used for that day to the SSO. All permits will be maintained as part of the permanent project files attesting to safety and health measures employed for a given task at a given time and place. Any problems encountered with the protective measures required should be documented on the permit and brought to the attention of the SSO.

11.0 CONFINED SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.** To eliminate any confusion 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 (multiple copies)
- Material Safety Data Sheets for all chemicals brought on site, including decon solutions, fuels, lime, sample preservatives, calibration gases, etc.
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers)
- Training/Medical Surveillance Documentation Form (Blank) (multiple copies)
- Emergency Reference Information (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted at the site for quick reference purposes. In situations where posting of these documents is not feasible (such as no office trailer), these documents should be filed in a transportable file container and immediately accessible. The file should remain in the FOL's possession.

Chemical Inventory Listing - This list represents all chemicals brought on site, including decontamination solutions, sample preservatives, fuel, calibration gases, etc.. This list should be posted in a central area.

Material Safety Data Sheets (MSDSs) - The MSDSs should also be in a central area accessible to all site personnel. These documents should match all the listings on the chemical inventory list for all

substances employed 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 - 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 Posting - This list is found within the training section of the HASP (See Figure 8-1). This list identifies all site personnel, dates of training (including site-specific training), and medical surveillance and 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) - This list of emergency numbers and hospital directions will be maintained at all phone communications points and in each site vehicle.

Medical Data Sheets/Cards - Medical Data Sheets will be filled out by all onsite 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 or a wallet card will be given to all personnel to be carried on their person.

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

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

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirators
CFR	Code of Federal Regulations
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
DOD	Department of Defense
DOT	Department of Transportation
EPA	Environmental Protection Agency
eV	electron Volts
FID	Flame Ionization Detector
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air
LEL/O ₂	Lower Explosive Limit/Oxygen
N/A	Not Available
NIOSH	National Institute Occupational Safety and Health
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photo Ionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
PVC	Poly Vinyl Chloride
SAP	Sampling and Analysis Plan
SCBA	Self Contained Breathing Apparatus
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
TOM	Task Order Manager
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average
UV	Ultraviolet
WP	Work Plan

ATTACHMENT I

**INJURY/ILLNESS PROCEDURE
AND REPORT FORM**

**TETRA TECHNUS, INC.****INJURY/ILLNESS PROCEDURE
WORKER'S COMPENSATION PROGRAM**

WHAT YOU SHOULD DO IF YOU ARE INJURED OR DEVELOP AN ILLNESS AS A RESULT OF YOUR EMPLOYMENT:

- If injury is minor, obtain appropriate first aid treatment.
- If injury or illness is severe or life threatening, obtain professional medical treatment at the nearest hospital emergency room.
- If incident involves a chemical exposure on a project work site, follow instructions in the Health & Safety Plan.
- Immediately report any injury or illness to your supervisor or office manager. In addition, you must contact your Human Resources representative, Marilyn Diethorn at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours. You will be required to complete an Injury/Illness Report (attached). You may also be required to participate in a more detailed investigation from the Health Sciences Department.
- If further medical treatment is needed, The Hartford Network Referral Unit will furnish a list of network providers customized to the location of the injured employee. These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work. Please call Marilyn Diethorn at (412) 921-8475 for the number of the Referral Unit.

ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

Contact your local human resources representative, corporate health and safety coordinator, or Corporate Administration in Pasadena, California, at (626) 351-4664.

Worker's compensation is a state-mandated program that provides medical and disability benefits to employees who become disabled due to job related injury or illness. Tetra Tech, Inc. and its subsidiaries (Tetra Tech or Company) pay premiums on behalf of their employees. The type of injuries or illnesses covered and the amount of benefits paid are regulated by the state worker's compensation boards and vary from state to state. Corporate Administration in Pasadena is responsible for administering the Company's worker's compensation program. The following is a general explanation of worker's compensation provided in the event that you become injured or develop an illness as a result of your employment with Tetra Tech or any of its subsidiaries. Please be aware that the term used for worker's compensation varies from state to state.

WHO IS COVERED:

All employees of Tetra Tech, whether they are on a full-time, part-time or temporary status, working in an office or in the field, are entitled to worker's compensation benefits. All employees must follow the above injury/illness reporting procedures. Consultants, independent contractors, and employees of subcontractors are not covered by Tetra Tech's Worker's Compensation plan.



CASE NO. _____

WHAT IS COVERED:

If you are injured or develop an illness caused by your employment, worker's compensation benefits are available to you subject to the laws of the state you work in. Injuries do not have to be serious; even injuries treated by first aid practices are covered and must be reported. Please note that if you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.



CASE NO. _____

**TETRA TECHNUS, INC.
INJURY/ILLNESS PROCEDURE
WORKER'S COMPENSATION PROGRAM**

To: Corporate Health and Safety Manager
Human Resource Administrator

Prepared by: _____

Position: _____

Project Name: _____

Office: _____

Project No. _____

Telephone: _____

Information Regarding Injured or Ill Employee:

Name: _____

Office: _____

Home address: _____

Gender: M F No. of dependents: _____

Marital status: _____

Home telephone: _____

Date of birth: _____

Occupation (regular job title): _____

Social Security No.: _____

Department: _____

Date of Accident: _____

Time of Accident: _____

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

Street address: _____

City, state, and zip code: _____

County: _____

Narrative Description of How Accident Occurred: (Be specific. Explain what the employee was doing and how the accident occurred.)



TETRA TECH, INC.
INJURY/ILLNESS REPORT

Did employee die? Yes No
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 accident report.

Witness(es):

Name:

Address:

Telephone:

Describe the Illness or Injury and Part of Body Affected:

Name the Object or Substance which Directly Injured the Employee:

Medical Treatment Required:

No Yes First Aid Only

Physician's Name: _____

Address: _____

Hospital or Office Name: _____

Address: _____

Telephone No.: _____

Lost Work Days:

No. of Lost Work Days _____

Last Date Worked _____

Time Employee Left Work _____

Date Employee Returned to Work _____

No. of Restricted Work Days _____

None

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:** _____

	Printed Name	Signature	Telephone No.	Date
Project or Office Manager				
Site Safety Coordinator				
Injured Employee				

To be completed by Human Resources:

Date of hire:

Hire date in current job:

Wage information: \$ _____ per _____ (hour, day, week, or month)

Position at time of hire:

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 insurance carrier:

Date reported:

Reported by:

TeleClaim phone number:

TeleClaim account number:

Location code:

Confirmation number:

Name of contact:

Field office of claims adjuster:

ATTACHMENT II

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



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number	HS-1.0	Page	1 of 12
Effective Date	06/99	Revision	0
Applicability	Tetra Tech NUS, Inc.		
Prepared	Health & Safety		
Approved	D. Senovich		

Subject
UTILITY LOCATING AND EXCAVATION CLEARANCE

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 PURPOSE	2
2.0 SCOPE	2
3.0 GLOSSARY	2
4.0 RESPONSIBILITIES	3
5.0 PROCEDURES	3
5.1 BURIED UTILITIES	3
5.2 OVERHEAD POWER LINES	4
6.0 UNDERGROUND LOCATING TECHNIQUES	5
6.1 GEOPHYSICAL METHODS	5
6.2 PASSIVE DETECTION SURVEYS	6
6.3 INTRUSIVE DETECTION SURVEYS	6
7.0 REFERENCES	7

ATTACHMENTS

1	LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES	8
2	UTILITY CLEARANCE FORM	10
3	FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION	11

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 2 of 12
	Revision 0	Effective Date 06/99

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 service locating and excavation clearance. It is the policy of TtNUS to provide a safe and healthful work environment for the protection of our employees. The purpose of this SOP is to aid in achieving the objectives of the TtNUS Utility Locating and Clearance Policy. The TtNUS Utility Locating and Clearance Policy should be reviewed by anyone 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 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 development of detailed operating procedures. This guidance is not intended to provide a detailed description of methodology and 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 a fixed distance apart. 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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 3 of 12
	Revision 0	Effective Date 06/99

4.0 RESPONSIBILITIES

Project Manager - Responsible for ensuring that all field activities are conducted in accordance with this procedure and the TtNUS Utility Locating and Clearance Policy.

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

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

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 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 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.

Where the positive identification and de-energizing of underground utilities cannot be obtained and confirmed using the following steps, the PM is responsible for arranging for the procurement of a qualified, experienced, utility locating contractor 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 site inspection must be performed to compare the site plan information to actual conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation must be marked at the site in white paint or pin flags to notify personnel of the proposed excavation 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, asphalt/concrete scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional Information regarding utility locations shall be added to project maps upon completion of this exercise.
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 on (and

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 4 of 12
	Revision 0	Effective Date 06/99

comply with) property owner requirements. It is important to note that private property owners may require from 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 are to mark their respective lines within the specified time frame.
5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other 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 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 auguring. Each method has advantages and disadvantages including complexity, applicability, and price.
7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment and utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed with a hand augur or pole 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 uncovered utilities must be supported. 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 Health and Safety Manager. 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 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.

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 5 of 12
	Revision 0	Effective Date 06/99

Nominal Voltage
0 -50 kV

Minimum Clearance
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 electromagnetics, magnetics, and ground penetrating radar. Additional details concerning the design and implementation of electromagnetic, magnetics, and ground penetrating radar surveys can be found in one or more of the TtNUS SOPs included in the References in Section 6.0.

Electromagnetics

Electromagnetic (EM) 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 good example of this type of geophysical equipment is an EM-61.

EM 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 EM surveys, simple magnetic locating and traced nonmetallic surveys.

When access can be gained to a conduit, a flexible insulated trace wire can also 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) and steel utility lines. A good 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.

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,

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 6 of 12
	Revision 0	Effective Date 06/99

electrical vs. telephone), hence, verification is 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. 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. High-quality hand-held thermal imagers are available from \$15,000 to \$30,000, with prices decreasing as new systems are introduced.

6.3 Intrusive Detection Surveys

Vacuum Excavation

Vacuum excavation is used to determine the exact horizontal and vertical location of 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 physical methods, borings must be hand-augured for all locations where there is a potential to impact buried utilities. Hand auguring must be performed to depths of no less than 4 feet. 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 placement of buried utilities is influenced by frost line depths that vary by geographical region. Attachment 3 presents frost line depths for the regions of the continental 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 auguring, the hole must be reamed by hand to at least the diameter of the drill rig auger or bit prior to drilling. For soil

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 7 of 12
	Revision 0	Effective Date 06/99

gas surveys, the survey probe shall be placed as close as possible to the cleared hand auger. It is important that a post-hole digger is not 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 augurs. Tile probes must be performed to the same depth requirements as hand augurs. Depending upon the site conditions and intended probe usage, tile probes should be made of non-conductive material such as fiberglass.

7.0 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

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 8 of 12
	Revision 0	Effective Date 06/99

ATTACHMENT 1 LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES

Alabama Alabama Line Location (800) 292-8525 Tucson Blue Stake Center (800) 782-5348
Alaska Locate Call Center of Alaska Inc. (800) 478-3121
Arizona Arizona Blue Stake Inc. (800) 782-5348
Arkansas Arkansas One Call System Inc. (800) 482-8998
California Underground Service Alert North (800) 227-2600 Underground Service Alert South (800) 227-2600
Colorado Utility Notification Center of Colorado (800) 922-1987
Connecticut Call Before You Dig (800) 922-4455
Delaware Miss Utility of Delmarva (800) 282-8555
District of Columbia Miss Utility (800) 257-7777
Florida Call Sunshine (800) 432-4770
Georgia Utilities Protection Center Inc. (800) 282-7411
Idaho Palouse Empire Underground Coordinating Council (800) 882-1974 Utilities Underground Location Center (800) 424-5555 Kootenai Country Utility Coordinating Council (800) 428-4950 Shoshone County One Call (800) 398-3285 Dig Line (800) 342-1585 One Call Concepts (800) 626-4950
Illinois Julie Inc. (800) 892-0123 Digger (Chicago Utility Alert Network) (312) 744-7000
Indiana Indiana Underground Plant Protection Services (800) 382-5544
Iowa Underground Plant Location Service Inc. (800) 292-8989
Kansas

Kansas One-Call Center (800) 344-7233
Kentucky Kentucky Underground Protection Inc. (800) 752-6007
Louisiana Louisiana One Call (800) 272-3020
Maine Dig Safe – Maine (800) 225-4977
Maryland Miss Utility (800) 257-777 Miss Utility of Delmarva (800) 282-8555
Massachusetts Dig Safe – Massachusetts (800) 322-4844
Michigan Miss Dig System (800) 482-7171
Minnesota Gopher State One Call (800) 252-1166
Mississippi Mississippi One-Call System Inc. (800) 227-6477
Missouri Missouri One Call System Inc. (800) 344-7483
Montana Utilities Underground Location Center (800) 424-5555 Montana One Call Center (800) 551-8344
Nebraska Diggers Hotline of Nebraska (800) 331-5666
Nevada Underground Service Alert North (800) 227-2600
New Hampshire Dig Safe – New Hampshire (800) 225-4977
New Jersey New Jersey One Call (800) 272-1000
New Mexico New Mexico One Call System Inc. (800) 321-ALERT Las Cruces-Dona Utility Council (505) 526-0400
New York Underground Facilities Protection Organization (800) 962-7962 New York City: Long Island One Call Center (800) 272-4480
North Carolina The North Carolina One-Call Center Inc. (800) 632-4949
North Dakota Utilities Underground Location Center (800) 795-0555
Ohio Ohio Utilities Protection Service (800) 362-2764

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 9 of 12
	Revision 0	Effective Date 06/99

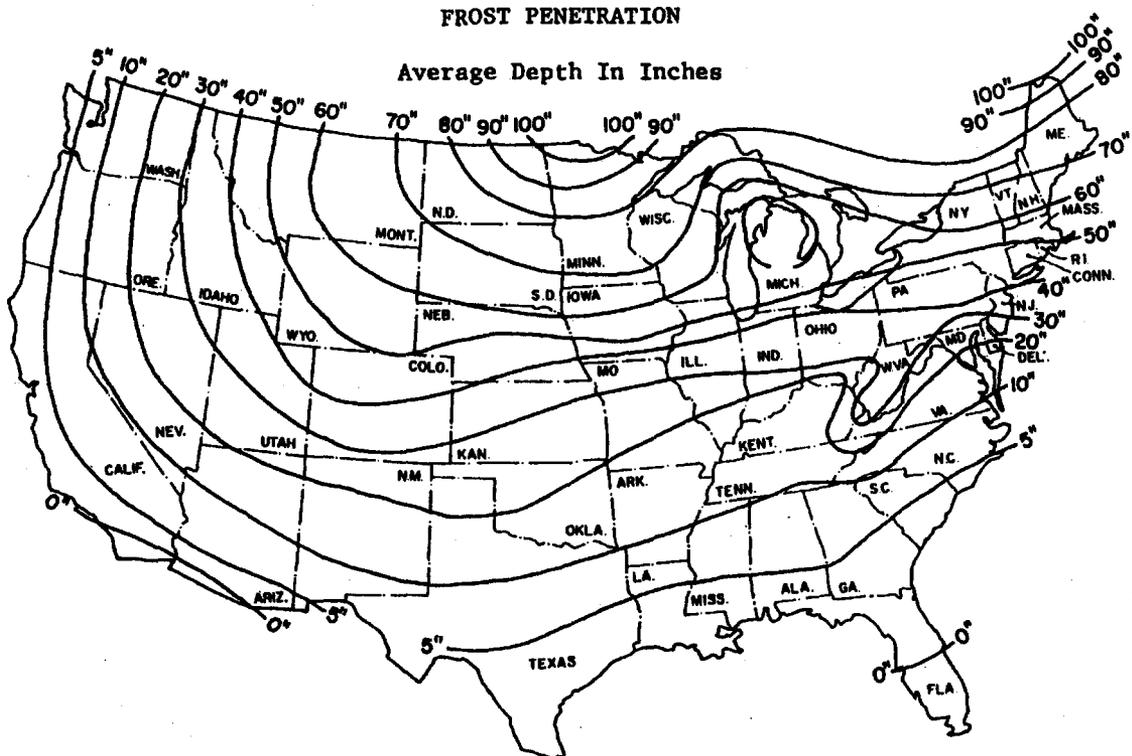
Oil & Gas Producers Underground Protection Service (800) 925-0988
Oklahoma Call Okie (800) 522-6543
Oregon Utilities Underground Location Center (800) 424-5555 Douglas Utilities Coordinating Council (503) 673-6676 Josephine Utilities Coordinating Council (503) 476-6676 Rogue Basin Utility Coordinating Council (503) 779-6676 Utilities Notification Center (800) 332-2344
Pennsylvania Pennsylvania One Call System Inc. (800) 242-1776
Rhode Island Dig Safe – Rhode Island (800) 225-4977
South Carolina Palmetto Utility Protection Service Inc. (800) 922-0983
South Dakota South Dakota One Call (800) 781-7474
Tennessee Tennessee One-Call System (800) 351-1111
Texas Texas One Call System (800) 245-4545 Texas Excavation Safety System (800) 344-8377 Lone Star Notification Center (800) 669-8344
Utah Blue Stakes Location Center (800) 662-4111
Vermont Dig Safe – Vermont (800) 225-4977
Virginia Miss Utility of Virginia (800) 552-7001 Miss Utility (800) 257-7777 Miss Utility of Delmarva (800) 441-8355
Washington Utilities Underground Location Center (800) 424-5555 Grays Harbor & Pacific County Utility Coordinating Council (206) 535-3550 Utilities County of Cowlitz County (360) 425-2506 Chelan-Douglas Utilities Coordinating Council (509) 663-6111 Upper Yakima County Underground Utilities Council (800) 553-4344 Inland Empire Utility Coordinating Council

(509) 456-8000 Palouse Empire Utilities Coordinating Council (800) 822-1974 Utilities Notification Center (800) 332-2344
West Virginia Miss Utility of West Virginia Inc. (800) 245-4848
Wisconsin Diggers Hotline Inc. (800) 242-8511
Wyoming West Park Utility Coordinating Council (307) 587-4800 Call-In Dig-In Safety Council (800) 300-9811 Fremont County Utility Coordinating Council (800) 489-8023 Central Wyoming Utilities Coordinating Council (800) 759-8035 Southwest Wyoming One Call (307) 362-8888 Carbon County Utility Utility Coordinating Council (307) 324-6666 Albany County Utility Coordinating Council (307) 742-3615 Southeast Wyoming Utilities Coordinating Council (307) 638-6666 Wyoming One-Call (800) 348-1030 Utilities Underground Location Center (800) 454-5555 Converse County Utility Coordination Council (800) 562-5561

Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 11 of 12
	Revision 0	Effective Date 06/99

ATTACHMENT 3

FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

ATTACHMENT III

EQUIPMENT INSPECTION CHECKLIST

EQUIPMENT INSPECTION

COMPANY: _____ **UNIT NO.** _____
FREQUENCY: Inspect upon arrival and at the initiation of each ten day shift when exiting the site and when major 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 shut-offs 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? _____
- 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

- | | Yes | No |
|---|--------------------------|--------------------------|
| - 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: Yes No

Site Safety Officer Signature

ATTACHMENT IV

SAFE WORK PERMITS

SAFE WORK PERMIT FOR MULTI-MEDIA SAMPLING

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 groundwater and soils. IDW sampling is also included in this task.

II. Required Monitoring Instrument(s): PID or FID

III. Field Crew: _____

IV. On-site Inspection conducted Yes No Initials of Inspector TINUS

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

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

Modifications/Exceptions: Minimum requirement include sleeved shirt and long pants, safety shoes, surgical style gloves, and safety glasses. Hard hats and hearing protection will be worn when working near operating equipment or when required by the SSO.

V. Chemicals of Concern <u>Site contaminants include</u> <u>VOCs and SVOCs (PAHs)</u> <u>from petroleum compounds</u>	Action Level(s) <u>Any sustained readings 10</u> <u>ppm above background</u> <u>in worker breathing zones.</u>	Response Measures <u>Suspend site activities and</u> <u>report to an unaffected area.</u>
--	---	---

VI. Additional Safety Equipment/Procedures

Hard-hat.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hearing Protection (Plugs/Muffs) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	<input type="checkbox"/> Yes <input checked="" 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 checked="" 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 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

Modifications/Exceptions: Reflective vests for high traffic areas. Tyvek coverall if there is a potential for soiling work clothes. Hearing protection will be worn when working near operating equipment.

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

VIII. Equipment Preparation

Equipment drained/depressurized.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA
Equipment purged/cleaned.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA
Isolation checklist completed.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA
Electrical lockout required/field switch tested.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA
Blinds/misalignments/blocks & bleeds in place.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA
Hazardous materials on walls/behind liners considered.....	<input type="checkbox"/> Yes	<input type="checkbox"/> NA

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

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

Job Completed by: _____ Date: _____

**SAFE WORK PERMIT FOR
SOIL BORINGS AND WELL INSTALLATION**

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. Work limited to the following (description, area, equipment used): Soil borings using Direct Push Technology techniques. Monitoring well installation is included in this task.

II. Required Monitoring Instruments: FID or PID

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)

IV. Protective equipment required	Respiratory equipment required	
Level D <input checked="" 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 checked="" type="checkbox"/>

Modifications/Exceptions: Minimum requirement include sleeved shirt and long pants, safety shoes, safety glasses, hardhat, hearing protection, and nitrile gloves or leather gloves with surgical-style inner gloves.

V. Chemicals of Concern	Action Level(s)	Response Measures
<u>Potential site contaminants include VOCs and SVOCs (PAHs) from petroleum compounds</u>	<u>Any sustained readings 10 ppm above background in worker breathing zones.</u>	<u>Suspend site activities and report to an unaffected area.</u>

VI. 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 checked="" 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 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		

Modifications/Exceptions: Reflective vests for high traffic areas. Tyvek coverall and impermeable boots if there is a potential for soiling work clothes.

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

VIII. Equipment Preparation	Yes	NA
Equipment drained/depressurized.....	<input type="checkbox"/>	<input type="checkbox"/>
Equipment purged/cleaned.....	<input type="checkbox"/>	<input type="checkbox"/>
Isolation checklist completed.....	<input type="checkbox"/>	<input type="checkbox"/>
Electrical lockout required/field switch tested.....	<input type="checkbox"/>	<input type="checkbox"/>
Blinds/misalignments/blocks & bleeds in place	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous materials on walls/behind liners considered.....	<input type="checkbox"/>	<input type="checkbox"/>

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

X. Special instructions, precautions: Minimize generation of airborne dusts.

Permit Issued by: _____ Permit Accepted by: _____

Job Completed by: _____ Date: _____