FINAL ACCIDENT PREVENTION PLAN FOR INSTALLATION WATER SERVICE TO PECONIC RIVER SPORTSMANS CLUB WITH TRANSMITTAL NWIRP CALVERTON NY

4/26/2012

SES-TECH ATLANTIC

Prepare in quintuplicate (original and 4 copies)

CONTRACTOR DRAWINGS & INFORMATION SUBMITTAL
EFANENAVFACENGCOM 4335/3 (Rev. 6/80)

CONTROL NO. 05

CONTRACT NO.	CONTRACT TASK ORDER NO.	ACTIVITY LOCATION
N40085-11-D-0043	**0002**	**Naval Weapons Industrial Reserve Plant, Calverton, NY**

PROJECT TITLE:
Peconic River Sportsman's Club Water Service Installation

FROM:	DATE
SES-TECH Atlantic: Project Manager, Stavros Patselas	April 26, 2012
TO:	*DATE*
Lora Fly (1 CD)	April 26, 2012

1. THE CONTRACTOR SUBMITTALS LISTED BELOW ARE FORWARDED FOR YOUR REVIEW AND RECOMMENDATIONS.
(a) APPLY APPROPRIATE STAMP IMPRINT TO EACH SUBMITTAL AND INDICATE REVIEW COMMENTS, AS REQUIRED.
(b) RETAIN ONE (1) COPY OF THIS TRANSMITTAL FORM AND RETURN REMAINING COPIES WITH REVIEWED SUBMITTALS TO ROICC.

2. THESE SUBMITTALS SHOULD BE RETURNED TO THIS OFFICE BY _____

3. _____

CD-COPY TO:	**PWD NEW LONDON:**	**C. Shukis** (1 CD)
	PWD NEW LONDON:	**G. Pearman** (1 CD)
	NWIRP BETHPAGE:	**A. Taormina** (1 CD)
	NAVAIR:	**R. Smith** (1 CD)
	TTNUS:	**D. Brayack** (1 CD)
	ADMINISTRATIVE RECORD:	**G. Wagner** (1 CD))
HARD COPY TO:	**PWD NEW LONDON:**	**C. Shukis** (1 hardcopy)
	PWD NEW LONDON:	**G. Pearman** (1 hardcopy)
	NWIRP BETHPAGE:	**A. Taormina** (1 hardcopy)
	ADMINISTRATIVE RECORD:	**G. Wagner** (1 hardcopy)

☐ ROICC ☐ RPM ☐ CSO

April 26, 2012
SIGNATURE AND DATE

FROM: DESIGNER	DATE
TO: ROICC	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE RETURNED, WITH ACTION TAKEN AS INDICATED.

2. _____

COPY TO:

☐ ROICC ☐ DESIGNER

SIGNATURE AND DATE

FROM: ROICC	DATE
TO: CONTRACTOR	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE APPROVED/DISAPPROVED AS SHOWN BELOW AND ON EACH STAMP IMPRINT.

COPY TO:
☐ ROICC ☐ OTHER

FOR COMMANDING OFFICER, ENGINEERING FIELD ACTIVITY NORTHEAST - NAVAL FACILITIES ENGINEERING COMMAND — DATE

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
1	SD-08, Statements; Final Accident Prevention Plan For Installation Of Water Service To Peconic River Sportsman's Club	Helene Conlan			

SES-TECH Atlantic

April 26, 2012
File: SESTECH-RAO/LTM-12-0029

Lora Fly
Remedial Project Manager (Code OPNEEV)
Facilities Engineering Command, Mid-Atlantic
Naval Facilities Engineering Command
Building Z-144
9742 Maryland Avenue
Norfolk, VA 23511-3095

SUBJECT: FINAL ACCIDENT PREVENTION PLAN FOR INSTALLATION OF WATER SERVICE TO PECONIC RIVER SPORTSMAN'S CLUB NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, CALVERTON, NY TASK ORDER NO. 0002 FOR US NAVY CONTRACT NO. N40085-11-D-0043

Dear Ms. Fly:

Enclosed is the *Final Accident Prevention Plan For Installation Of Water Service To Peconic River Sportsman's Club, Naval Weapons Industrial Reserve Plant, Calverton, NY.* This work will be completed under Remedial Action Operations (RAO)/Long Term Management (LTM), Environmental Multiple Award Contract (EMAC) No. N40085-11-D-0043, Task Order No. 0002.

Please do not hesitate to contact me with any questions regarding this document at office phone # 215-702-4099 or via email stavros.patselas@tetratech.com.

Sincerely,

Stavros Patselas
Task Order Manager

Enclosure

cc: C. Shukis, PWD New London
G. Pearman, PWD New London
A. Taormina, NWIRP Bethpage
R. Smith, NAVAIR
D. Brayack, TtNUS
G. Wagner, Administrative Record
File

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION OPERERATIONS (RAO)/LONG TERM MANAGEMENT (LTM),
ENVIRONMENTAL MULTIPLE AWARD CONTRACT (EMAC)
CONTRACT NO. N40085-11-D-0043
TASK ORDER NO. 0002

FINAL
ACCIDENT PREVENTION PLAN
FOR
INSTALLATION OF WATER SERVICE TO PECONIC RIVER SPORTSMAN'S CLUB
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
CALVERTON, NEW YORK

Issued:

April 26, 2012

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Norfolk, VA 23511-3095

Prepared by:

SES–TECH Atlantic
5700 Lake Wright Drive
Twin Oaks, Suite 309
Norfolk, VA 23502

DCN: SESTECH-RAO/LTM-11-0029

Revision:	Date:	Prepared by:	Approved by:	Approved by :
0	April 26, 2012	C. Joblon	R. Margotto, CIH	S. Patselas

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ABBREVIATIONS AND ACRONYMS

AHA	Activity Hazard Analysis
ANSI	American National Standard Institute
APP	Accident Prevention Plan
CIH	Certified Industrial Hygienist
CSQ®	Client Service Quality®
DART	days away restricted or treatment
DIR®	Do It Right®
EHS	Environmental, Health and Safety
EMAC	Environmental Multiple Award Contract
EMR	Experience Modification Rate
ESS	Environmental Safety Supervisor
LTM	Long Term Monitoring
MSDS	Material Safety Data Sheets
NAVFAC MIDLANT	Naval Facilities Engineering Command Mid-Atlantic
NTCR	Non-Time Critical Removal
OSHA	Occupational Safety and Health Administration
PESM	Project Environmental Safety Manger
PM	Project Manager
PPE	personal protective equipment
PRSC	Peconic River Sportsman's Club
RAO	Remedial Action Operation
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
SCDHS	Suffolk County Department of Health Services
SES	Sealaska Environmental Services, LLC
SES-TECH	SES-TECH Atlantic
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TtEC	Tetra Tech EC, Inc.
USACE	United States Army Corps of Engineers
ZIP®	Zero Incident Performance®

1.0 SIGNATURES

The planned Non-Time Critical Removal (NTCRA) will be performed by SES-TECH Atlantic (SES-TECH), a joint venture between Sealaska Environmental Services, LLC (SES) and Tetra Tech EC, Inc. (TtEC) under the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC MIDLANT) Remedial Action Operation (RAO) Long Term Monitoring (LTM) Environmental Multiple Award Contract (EMAC).

The cover page to this document identifies the preparer and the two approvers of this document. This section of the Accident Prevention Plan (APP) contains the signatures of the preparer, the two approvers [the Certified Industrial Hygienist (CIH) and the Project Manager (PM)] and a Concurrence Approval by the Authorized Corporate Officer. This APP is intended to provide guidance to project personnel by identifying common job hazards and high loss potential activities.

All personnel working under this APP will sign the acknowledgement form included in the Peconic River Sportsman's Club (PRSC) Water Line Installation Project Site Safety and Health Plan (SSHP).

The following personnel participated in the development, review and approval process of this APP.

APP Prepared by:

_____

Christine Joblon
Safety and Health Officer
(215) 702-4025

APP Approved by:

_____

Roger Margotto, CIH, CSP
PRSC Project Environmental Safety Manager
CIH, CSP
(619) 471-3503

APP Approved by:

_____

Stavros Patselas
PRSC Project Manager
(215) 702-4099

APP Approval Concurrence by:

_____

Peter McCormick
Program Manager
Authorized Corporate Officer

2.0 BACKGROUND INFORMATION

a. **Contractor:** SES-TECH, Norfolk, VA
b. **Contract Number:** N40085-11-D-0043
c. **Project Name:** Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton
d. **Project Description & Description of Work to be performed:**

NWIRP Calverton was used for the development, assembly, testing, refitting, and retrofitting of Naval combat aircraft. The government owned, contractor operated facility supported aircraft design and production at nearby NWIRP Bethpage. Northrop Grumman Corporation operated the facility until 1996.

Currently, there are no operational activities or process-type operations being conducted at NWIRP Calverton that could generate hazardous waste nor are there any requirements for storage of hazardous materials on the Navy's property The Navy has owned all or parts NWIRP Calverton since the early 1950s. Various parcels of land have since been transferred to other parties (e.g., the Veterans Administration, the NYSDEC, and the Town of Riverhead).

The PRSC is located at the southern end of the Southern Area plume. PRSC is located along the banks of an un-named pond created by a dam across the Peconic River. PRSC includes a Main Lodge, Activities Center, a private residence, and pistol, rifle, and archery ranges. Three individual wells provide water to the Main Lodge, Activities Center, and the private residence. A well at the pistol range was shut down because of VOC contamination. Fire protection is provided by a fifth high capacity well.

In 2001, routine monitoring of PRSC water supplies by Suffolk County Department of Health Services (SCDHS) detected chlorinated solvent-type VOCs in one of the wells on the PRSC property.

SES-TECH will provide the materials, equipment, and manpower to complete the installation of a potable drinking water supply to the PRSC Site.

PRSC Water Service Installation Tasks:

- Mobilization, including site control/traffic control
- Subsurface geophysical and geographical survey
- Install sediment control/silt fence
- Excavation (trench) to a depth of five feet and backfilling
- Install two-inch HDPE water service line
- Hydrostatic line testing and supply line disinfection
- Abandon four (4) groundwater wells
- Waste management, including waste water sample collection)
- Site restoration and demobilization, including equipment decontamination

There are no known or suspected contaminant sources within the PRSC Site.

e. **Project Location:**

NWIRP Calverton is located in Suffolk County, Long Island, NY, within the municipality of Riverhead. The PRSC Site is located off of River Road in Manorville, NY (Figure 1). It is located along the banks of an un-named pond created by a dam across the Peconic River.

f. **Anticipated Phases of Work – Tasks requiring Activity Hazard Analyses (AHAs)**

- Mobilization, including silt fence installation, geophysical (utility) and site survey
- Excavation to a depth of five feet, installation of two-inch HDPE pipe, and backfilling
- Former potable well abandonment
- Site Restoration and demobilization

g. **SES-TECH Accident Experience Modification Rate (EMR)**
The current SES-TECH Interstate Experience Modification Rate (EMR) for Policy Period October 1, 2010 through September 30, 2011 is 0.74.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

The Management of SES-TECH is committed to ensuring the health, safety, and wellbeing of our employees and the communities in which we work, to enhancing and protecting the environment, and to providing quality service to our clients. This commitment is fundamental to our Client Service Quality® (CSQ®), Do It Right® (DIR®) and Shared Vision® operating philosophies.

This APP is intended as a guideline that allows site personnel to respond to routine work conditions in a safe and compliant manner.

This APP has been developed to fulfill this goal and achieve the following objectives:

- Instruct SES-TECH employees and subcontractors on safe work procedures;
- Provide guidelines for emergency response for known hazards and hazardous situations; and
- Specify actions required to comply with applicable United States Department of Labor, Occupational Safety and Health Administration (OSHA), United States Army Corps of Engineers (USACE) Engineering Manual EM385-1-1.

The following exhibits describe the Safety and Health Policy and are part of the corporate Environmental, Health and Safety (EHS) program.

The corporate statement of Safety and Health Policy is found in Attachment C along with other applicable corporate Safety and Health Policies.

The corporate policies included in Attachment C are:

- Environmental Safety and Quality Policy
- Corporate Health and Safety Program Procedures List
- Zero Incident Performance® Policy

- Zero Incident Performance® Pledge

3.1 Safety and Health Expectations, Incentive Program, and Compliance

3.1.1 Safety Program Goals

SES-TECH Corporate Management and the PRSC Site Project Management team believes that all accidents are preventable through careful planning, tasking, and error free execution of work. It is SES-TECH policy that everyone is responsible for working safely and for identifying and controlling work place hazards. This is the foundation of the company's Zero Incident Performance® (ZIP®) philosophy. SES-TECH has adopted ZIP® as the central safety goal for the PRSC Site project. A safety goal of anything more than zero is to assume that some co-workers will get hurt.

In pursuing this goal, SES-TECH strives to achieve zero recordable injury cases for the current and subsequent contract years, no property loss events, no first aid cases, and no serious environmental releases (greater than reportable quantity). In achieving this goal SES-TECH's objective is to post a steady decrease in OSHA Recordable incident rates, days away restricted or treatment (DART) incident rates and DART severity rates to well below industry averages. SES-TECH also expects EMR rates to remain less than 1.0 with a gradual lowering of the rate over time.

3.1.2 Incentive Program

There are no incentive programs scheduled for this project. The Project is a short duration project and the incentive program will be in effect.

3.1.3 Resolving Non-Compliance Problems

Compliance with the safety and health requirements described in the APP, SSHP, site specific work rules, project work plans, applicable worker safety regulations and corporate policies and procedures is a performance requirement on SES-TECH projects. When lapses in compliance occur, the PM will resolve the issue by discussing the problem with the individual or subcontractor directly, by stating clearly the nature of the deficiency and the steps that need to be taken to correct it. If compliance problems continue to exist, any employee may be terminated and removed from the project.

3.1.4 Management Accountability

To ensure Project Management is held accountable for their safety and health performance, the SES-TECH EMAC Program Manager and SES-TECH executive management will conduct periodic reviews of program/project performance. They will evaluate the nature of all incidents and direct feedback with regards to managing health and safety risks. During these periodic reviews the means, methods, and lessons learned are discussed with regard to improving safety and health performance.

3.1.5 Zero Incident Performance®

Zero Incident Performance® (ZIP®) describes our approach and expectations for both safety and project execution. We will achieve this level of performance excellence through teamwork and partnering with our client and our Subcontractors, and through the participation of every person on this project. Each employee and subcontractor employee of SES-TECH has the responsibility to help create and work in a safe and environmentally protective manner to strive for ZIP®.

We (SES-TECH and our client) believe that:

"All incidents are preventable through proper planning, tasking, and execution of plans as written. Any goal besides Zero Incident Performance® is unacceptable and sends the message that incidents cannot be prevented."

In addition, an incident includes an event which could have resulted in one of these outcomes had the circumstances been different ("near miss").

Each person on this project is individually responsible and accountable for their safety performance. Active participation by all personnel is required in order to achieve ZIP®. This includes SES-TECH personnel and Subcontractor personnel. If an incident does occur, it must be reported and investigated to identify root causes, take corrective actions, and communicate the lessons learned.

Subcontractor's health and safety record is a key evaluation factor prior to sub contract award. Only subcontractors that meet SES-TECH's health and safety criteria as specified in corporate procedure EHS 1-4 (see Attachment D of this APP.) will be selected to work on-site. Each subcontractor will receive the APP and SSHP as part of the subcontract procurement package, so that they can properly understand the expectations of the project. Subcontractors, after contract award, shall be required to attend a health and safety orientation prior to working on site. This meeting will involve the subcontractor's key personnel and will cover ZIP® expectations.

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

SES-TECH is ultimately responsible for the implementation of the Health and Safety Program. This section identifies the roles and responsibilities of SES-TECH personnel conducting activities at the Site. The Project Manager and field representatives have the qualifications, training and experience to safely conduct their respective tasks while also providing a safe work environment. Attachment B of the APP includes the resumes of key personnel for the Site. These resumes detail the representative project experience, dates of service, training certifications and other applicable clearances and qualifications for each key site individual.

4.1 Management Accountability

To ensure project management is held accountable for safety and health performance they evaluate the nature of all incidents, conduct inspections, and include safety and health performance as a specific performance category in staff annual performance appraisals.

4.2 Project Environmental Safety Manger/Program CIH

The Project Environmental Safety Manger (PESM) and Program CIH helped prepare and approve the APP and any subsequent amendments prior to adoption into the Site EHS Program and Site EHS Documents. The PESM will provide project support on health and safety issues. The PESM will advise the PM regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety related issues, as needed.

The PESM/Program CIH for the PRSC Site is:

Mr. Roger Margotto, CIH, CSP
1230 Columbia St., Suite 750
San Diego, CA 92101-8536
Office - (619) 471-3503
Cell - (619) 988-0520
roger.margotto@tetratech.com

4.3 Project Manager

The Project Manager (PM) ensured that the APP and SSHP, was prepared, reviewed, and approved. The PM also will ensure the APP and SSHP is implemented. During the course of the project, the PM will review and approve any subsequent amendments prior to adoption into APP, Site EHS Program, and/or Site EHS Documents. The PM is responsible for the overall health and safety performance and compliance with applicable regulations, is the senior contact in the event of a site emergency.

The PM for the PRSC Site is:

Mr. Stavros Patselas
820 Town Center Drive, Suite 100
Langhorne PA 19047
Office - (215) 702-4099
Cell - (215) 688-9959
Fax - (215) 702-4045
stavros.patselas@tetratech.com

4.4 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) is Mr. Stavros Patselas. The SSHO will be present during the conduct of site operations and possesses the knowledge and experience necessary to implement all elements of the approved plans. The qualifications of the SSHO for this project included minimum 5 years of experience and the successful completion of the SES-TECH Environmental Safety Supervisor (ESS) Course. This course includes completion of 30 hours of web-based training in Construction Safety (and 16 hours of instructor led training by senior EHS staff member). The SSHO requirements also include the completion of the 40-hour HAZWOPER training and annual 8-hour HAZWOPER refresher training.

The SSHO for the PRSC Site is:

Mr. Stavros Patselas
820 Town Center Drive, Suite 100
Langhorne PA 19047
Cell - (401) 225-6346
ed.urbanek@tetratech.com

The SSHO will implement this APP and the SSHP in the field. The SSHO authority and responsibilities include, but are not limited to, the following:

- Executes the means for control of subcontractors as described in Section 5.2 of this APP.

- Ensures that site personnel provide adequate and applicable training documents certifying an individual's qualification to work at the Site.
- Ensures that all health and safety activities for SES-TECH personnel and its subcontractors are identified in the SSHP they are conducted in compliance with the SSHP.
- Conducts pre-task safety and health analysis.
- Conducts and documents safety briefings and site orientations (as necessary).
- Ensures that monitoring instruments are properly calibrated and maintains health and safety field log books.
- Directs and coordinates health and safety monitoring activities and ensures that the proper personal protective equipment (PPE) is utilized by field teams.
- Upgrades or downgrades PPE based on site conditions and/or real-time monitoring results.
- Identifies operational changes which require modifications to health and safety procedures and the SSHP, and ensures that any procedure modifications are approved by PESM and documented.
- Conducts weekly and monthly inspections and reports to PESM to provide summaries of field operations and progress.
- Performs emergency coordinator duties and ensures that adequate emergency response preparation and procedures and emergency response equipment is maintained.
- Notifies PESM of accidents/incidents, coordinates and completes investigation reports with PM.

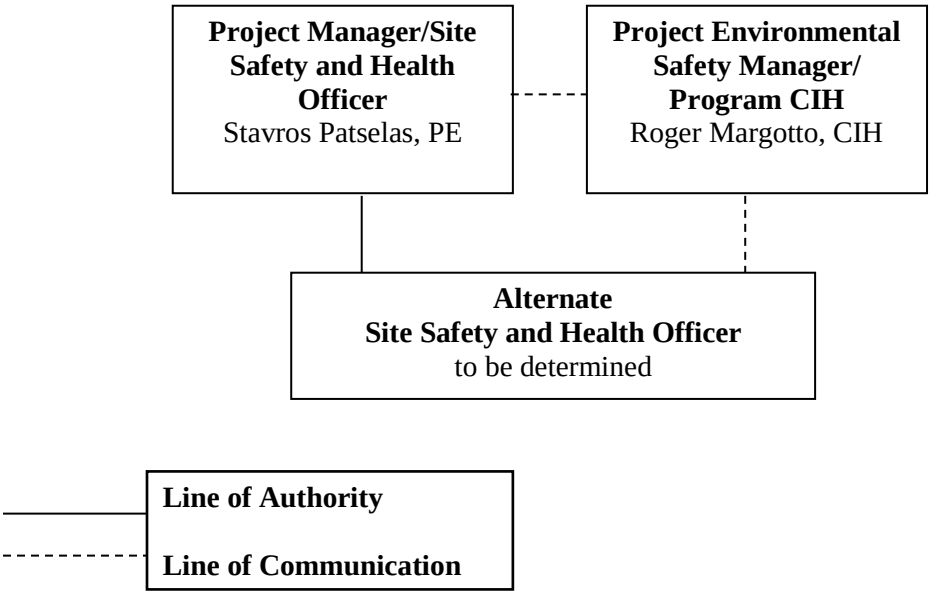
4.5 Alternate Site Safety and Health Officer

The Alternate SSHO is to be determined. The Alternate SSHO will substitute for the SSHO when the SSHO is not on-site and will be present during the conduct of operations. The Alternate SSHO possesses the knowledge and experience necessary to implement all elements of the approved plans. The qualifications of the Alternate SSHO are the same as those for the SSHO and include a minimum 5 years of experience and the successful completion of the SES-TECH ESS Course. This course includes completion of 30 hours of web-based training in Construction Safety (and 16 hours of instructor led training by senior EHS staff member). The SSHO requirements also included the completion of the 40-Hour HAZWOPER training and annual 8-hour HAZWOPER refresher training.

The Alternate SSHO for the PRSC Site is: To be determined.

The Alternate SSHO will implement this APP and the SSHP in the field. The Alternate SSHO authority and responsibilities are the same as those of the SSHO.

PROJECT ORGANIZATION CHART
Peconic River Sportsman's Club Water Service Line Installation Project



5.0 SUBCONTRACTORS AND SUPPLIERS

5.1 Identification of Subcontractors and Suppliers

All SES-TECH employees and all subcontractors working on the PRSC Site will be required to comply with applicable United States Department of Labor, OSHA, USACE Engineering Manual EM385-1-1, APP and SSHP requirements.

This APP recognizes that projects such as this require involvement of subcontractors and suppliers. All subcontractors will be evaluated and approved according to the provisions of corporate procedure EHS 1-4. This procedure involves the examination of potential subcontractors relative to prior EHS performance, including a review of incident rates, OSHA 300 logs and OSHA violation history. Corporate procedure EHS 1-4 is included in Attachment D of this APP.

There are four subcontractors whose employees are affected by this APP: the underground utility service locator, the site surveyor, the excavation/water service installer, and a driller/well abandonment subcontractor.

5.2 Means for Controlling and Coordinating Subcontractors

Once on-site, SES-TECH controls and provides direction to the subcontractor through the project contract, site plans, site specific orientation, daily safety briefings and by providing on-site direction to the subcontractor supervisor regarding tasks to be performed and the manner in which they are to be performed. SES-TECH management is responsible for making sure subcontractor employees review and follow the policies, procedures and requirements of the APP and the SSHP.

SES-TECH's SSHO will ensure subcontractor accountability and compliance with Site Health and Safety requirements by:

- Providing APP and SSHP with subcontract procurement package to each subcontractor.
- Reviewing subcontractor training records for compliance and appropriate updates.
- As applicable, reviewing the subcontractor's health and safety plan to ensure compliance with SES-TECH's SSHP.
- Providing each subcontractor employee with a Site Specific Health and Safety training/orientation, during which the requirements of the APP and SSHP are discussed. This will include the training and use of the appropriate PPE.
- At conclusion of Site Specific Health and Safety training, the SSHO has each subcontractor employee sign the Field Personnel Review sheet found in Section 15.0 of the SSHP.
- Conducting daily health and safety briefings with subcontractors.
- Monitoring and assessing subcontractor compliance with APP and SSHP by performing periodic oversight of subcontractor work areas and subcontractor employees, as well as periodic meetings with the subcontractor's representative.
- Holding subcontractor accountable for compliance with APP and SSHP requirements.
- When lapses in compliance occur, resolving the issue by discussing the problem with the subcontractor employee or subcontractor representative directly.
- The SSHO will clearly state the nature of the deficiency and the steps that need to be taken to correct it.
- If compliance problems continue to exist, giving the subcontractor a "stop work" order until the subcontractor's employee is removed from the project.

Hazards not listed in this APP, but known by the subcontractor, or known to be associated with a subcontractor's specialty, must be identified and addressed prior to beginning work. SES-TECH has the authority to immediately suspend field activities when observing unsafe conditions or in the event of an imminent safety hazard or potentially dangerous situation.

5.3 Safety Responsibilities of Subcontractors and Suppliers

SES-TECH Subcontractors are responsible for:

- Acknowledge receipt of this plan and the hazard communication briefing;
- Providing their personnel with appropriate PPE as specified by SES-TECH and their safety plan;
- Fulfilling the requirements established by this plan;
- Ensuring that their employees are properly trained and are in compliance with applicable regulations;
- Allocating sufficient time, materials and equipment to safely complete activities in accordance with this APP and the SSHP; and
- Providing their company-specific Safety and Health Programs and AHAs to SES-TECH, as applicable and as required.

6.0 TRAINING

Prior to on-site work, workers will attend a site specific safety and health training/orientation. Additionally, prior to on-site work, the following mandatory training is required in accordance with 29 CFR, Part 1910.120;

- 40-hour OSHA Hazardous Waste Operations and Emergency Response, and
- Current 8-hour OSHA HAZWOPER refresher certificate.

Periodic Safety and Health update training shall be maintained current. For example, 8-hour OSHA HAZWOPER refresher training class shall be taken annually by employees and supervisors. Resumes for site personnel, which include Certificates of OSHA Training (and other applicable training certifications) are included in Attachment B.

The following sections identify other required trainings associated with this project.

6.1 Site-Specific Training & Orientation

The SSHO provides site-specific training/orientation to all personnel (including subcontractors) assigned to the Site and will highlight all provisions contained within the APP and SSHP. This training/orientation will specifically address procedures, training and use of PPE, monitoring, site layout, identified hazards, local emergency support services, emergency response, hazard communication training, and equipment used for the hazard identification and control. Site specific training/orientation will also allow field workers the opportunity to clarify any issue or direction they do not understand. This training/orientation also serves to reinforce their responsibilities regarding safety and health aspects for their particular activity. Additional worker training, if required for completion of field tasks, will be provided to each SES-TECH or subcontractor employee.

6.2 Daily On-Site Safety Briefings

Project personnel (including subcontractors) and visitors are provided initial and daily on-site health and safety briefings by the SSHO, or qualified designee, to assist site personnel in safely conducting their work activities. This training will be conducted prior to the start of new work activities using AHAs. The briefings will include information on new operations to be conducted, PPE to be used, changes in work practices, or changes in the Site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, and identify performance deficiencies related to safety during daily activities or as a result of safety inspections.

6.3 First Aid and CPR

The closest Emergency Care Facility is Central Suffolk County Hospital. Mr. Stavros Patselas (SSHO) and the Alternate SSHO are both trained and qualified to provide on-site first aid and CPR. A map to Central Suffolk Hospital is included as Figure 3.

6.4 Competent Persons

In accordance with EM 385-1-1, Mr. Stavros Patselas and the Alternate SSHO, are designated by the Project Manager, Stavros Patselas, as the Competent Person (s) for Underground Ground Utilities (EHS 3-15) and Excavation and Trenching (EHS 6-3). Their resumes include training in OSHA 30-Hour Construction Safety Awareness.

7.0 SAFETY AND HEALTH INSPECTIONS

SES-TECH will perform EHS inspections, as applicable, to assess site conditions and verify compliance with applicable laws and regulations. The SSHO will perform daily inspections of work area. The Project Manager or designee will perform inspections as possible. The PESM may perform a surprise inspection at any time.

- Informal daily inspections are performed by SSHO.
- Any deficiencies on daily inspections are noted on a Deficiencies Log
- Project Manager may conduct an unannounced inspection at any time.
- Inspections may be performed and observations documented.
- Inspections will be tracked for deficiencies and follow-up action.

8.0 ACCIDENT REPORTING

Worker and subcontractor Accident/Incident Exposure data and hours worked are reported monthly by SSHO to PESM. Corporate procedure EHS 1-7, Incident Reporting and Investigation (included in Attachment D), details the procedures and the forms used by SES-TECH for event investigation. When an incident occurs, the SSHO will immediately notify the PM and PESM, and the PM will notify the contract Program Manager. If the incident is an OSHA recordable injury or exceeds $200,000 in property damages, the PM will immediately notify the NAVFAC Remedial Project Manager (RPM) or Resident Officer in Charge of Construction (RIOCC). The SSHP has additional reporting requirements and full contact information.

- The NAVFAC RPM is Ms. Lora Fly, contact number: (757) 341-2012.

- The NAVFAC RIOCC is Mr. Greg Pearman, contact number: (860) 235-2040.

After the event report of incident is completed, the SSHO must submit a draft written SES-TECH event report within 24 hours. Within 10 days of occurrence, a completed investigation report must be submitted to the PESM. All reports are reviewed by the PM and the PESM. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. The system requires follow-up to ensure completion of corrective actions.

Report of applicable accidents or incidents shall be made to the NAVFAC RPM and ROICC as soon as possible, but not more than 24 hours after occurrence. The PM or the SSHO will complete a Contractor's Significant Incident Report as required for any OSHA Recordable injury. Investigation and corrective actions shall be submitted to the NAVFAC RPM/RIOCC no later than five (5) working days following the incident. Corrective actions shall be implemented as soon as reasonably possible.

The PM or the SSHO will immediately notify the NAVFAC RPM/RIOCC in the event of:

- A fatal Injury;
- A permanent total disability;
- A permanent partial disability;
- The hospitalization of three or more people resulting from a single occurrence; or
- Property damage of $200,000 or more.

9.0 MEDICAL SUPPORT

SES-TECH uses a Board Certified Occupational Health Physician and a network of clinics that are arranged by our corporate occupational medical service provider to monitor and treat injuries and provide medical clearance in accordance with OSHA 29 CFR 1910.120. All personnel assigned to the project must have a current medical certification to indicate fitness for duty, clearance to wear PPE and identify any work restrictions. The exam must have been performed annually or biennially depending on the decision of the corporate medical provider.

On-site medical support (in the form of first aid and CPR) is provided by Mr. Stavros Patselas, SSHO. Certifications of Mr. Patselas' first aid and CPR training are included in Attachment B.

The closest civilian medical emergency/urgent care facility is Central Suffolk Hospital and has been identified as the primary medical facility for the Site. A route map to Central Suffolk Hospital is included as Figure 3. The SSHP provides additional information regarding on-site medical support program. Off-site medical support (non-emergency care) is provided by both Central Suffolk Hospital and the Occupational Work Care Clinic.

Primary EMERGENCY /URGENT Care Facility:

Central Suffolk Hospital
Peconic River Medical Center
Riverhead, New York
ER (631) 548-6200
Main (631) 548-6000

Non-Emergency/Occupational Care Facility:

Island Urgent Medical Care
1228 East Main Street
Riverhead, NY 11901
Phone number: 631-603-3400

The SSHP identifies the Work Care clinic as the principal occupational medical care facility. A map to the Work Care clinic is included as Figure 4.

10.0 PERSONAL PROTECTIVE EQUIPMENT

As indicated in the SSHP, the PESM conducted hazard assessments and specified the level of PPE required for each of the planned tasks. When/if a new activity is identified during the project, the SSHO or the PM will contact the PESM for task evaluation, performance of the hazard assessment, identification of appropriate PPE, and to write and/or approve the AHA.

The SSHO will be responsible for ensuring that all personnel comply with the PPE requirements outlined in this section. Table 6-1 of SSHP specifies required PPE for each on-site activity. The CIH signature in the SSHP constitutes certification of the hazard assessment. Modifications to initial PPE selection may be made by the SSHO with approval of the PESM.

Hazard assessments were conducted by the PESM and SSHO using the AHA form. The PPE described in this section for the indicated protection levels meets American National Standard Institute (ANSI) standards or equivalent.

SES-TECH is not responsible for providing any PPE equipment, as described herein, to subcontractor employees. Employees of subcontractors must arrive on site with their individually assigned PPE.

Training in the selection, use, and maintenance of PPE is covered in the following site prerequisite course work/training:

- Site Specific Safety and Health Training/Orientation
- 40-hour OSHA HAZWOPER Training
- 8-hour OSHA HAZWOPER Annual Refresher
- 30-hour Construction Safety Course

If any worker demonstrates through word or action, a lack of understanding in required training or the use and/or limitations of PPE, the affected individual will receive additional site specific health and safety training/orientation from SSHO.

Attachment B of the APP includes the resume of Stavros Patselas. This resume details project experience, dates of service, training certifications and other applicable clearances and qualifications.

Work practices which do not meet requirements of the APP/SSHP, as observed by the SSHO, will be immediately addressed through various means such as:

- Discussion with employee;
- Investigation of situation; or
- Retraining (as necessary).

11.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL (AS APPLICABLE)

SES-TECH has written programs that provide specific direction for compliance with OSHA requirements, USACE regulations, and implementation of SES-TECH policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

11.1 Layout Plans

This project will not erect any temporary facilities. The primary function of the project will occur along the roadside leading to the PRSC facility, which is a permanent structure. The layout of the Site is identified in the Site Layout Map included as Figure 2.

11.2 Emergency Response Plans

Emergency response has been planned for injuries, explosions and fires, accidents and severe weather. .

The PESM performed an evaluation of the critical tasks associated with Plant operations and formulated an Emergency Response Plan to address hazards and controls associated with Plant critical operations.

The Emergency Response Plan includes:

- Emergency Response procedures will be reviewed during the Site Specific Safety and Health Training/Orientation.
- An Emergency Response Drill will be performed annually and a critique documented.
- Evacuation route is: SSHO will determine upon mobilization and communicate to site workers
- The rally point for the emergency evacuation is to be determined upon mobilization
- The SSHO will conduct a head count at the rally point to account for any staff on site (if any).
- The Evacuation Route and Rally Point will be available in Site superintendent vehicle.
- The SSHO is first aid and CPR trained, and is the Emergency Coordinator.
- In the event of an Emergency, the SSHO will contact EMS or other applicable Emergency Services.
- Emergency Medical Services and other important Emergency Site Contact telephone numbers are included in Table 11-1 of this APP.
- The Emergency Contact Numbers will also be posted on site.
- The SSHO will contact Emergency Response Services and verify telephone numbers annually.
- All emergencies shall be reported immediately to the SSHO.
- The SSHO will immediately report all emergencies to the PM.
- Effectiveness of the Emergency Response Plan will be evaluated by the PESM.
- Prior to the start of any new task, a Hazard Evaluation will be performed which will include an assessment of any additional Emergency Response requirements not previously identified.
- Any additional Emergency Response requirements will be reviewed and approved by the PM and the PESM.

Refer to the SSHP in Attachment A for further Emergency Response procedures.

11.3 Spills and Spill Prevention, and Spill Control

This section addresses the primary information that is necessary to reference in the event of an actual spill, release, or other emergency's during critical site operations. All spills must be reported to SSHO.

- Stop the source of the leak, spill or emergency if safe to do so. This may include shutting down the remediation system;
- Notify the Project Manager and Regulatory Compliance Specialist of the incident and injuries and notify emergency medical services (911), if needed;
- Contain the spill, if safe to do so; and
- Clean the spill area, either using facility personnel or a spill cleanup contractor.

Observe and identify emergency details:

- Where
- When
- In the event of a spill provide:
- Spill details (i.e. what was spilled)
- Spill amount
- Area conditions
- Spill direction and movement
- Control actions being taken/ongoing

11.4 Emergency Response -Fire Fighting Plan

In the unlikely event of a fire or explosion, Emergency Response procedures will include:

- Immediately evacuating the Site;
- Assembly at the designated rally point; and
- Notification of local fire and police departments (by dialing 911).

No personnel will fight a fire beyond the stage unless trained in the proper use of fire extinguishers and if the fire can be put out with a portable extinguisher in 30 seconds or less (incipient stage).

Adhering to the following precautions will prevent fires:

- Good housekeeping and proper storage of flammable materials;
- Smoking is permitted only in areas designated by SSHO; and
- Performing monthly inspections of fire extinguishers.

A map of all fire extinguisher locations will be located in the Site Superintendent. The person responsible for the maintenance of fire prevention and/or fire suppression equipment is the site SSHO.

11.5 Emergency Telephone Numbers

Table 11-1 is the list of emergency contact numbers, which will be posted on site. Additional Emergency Response Plan Information (as defined by 29 CFR 1910.120) is included in Section 12 of the SSHP.

11.6 Man Overboard/Abandon Ship

Not Applicable.

Table 11-1 Emergency Contact Telephone Numbers		
Contact	**Firm or Agency**	**Telephone Number**
Police	Suffolk County Police Long Island, NY	911 or (631) 852-2000
Fire	Riverhead Fire Dept Riverhead, Long Island/NY	911 or (631) 727-2751
Ambulance	Riverhead Volunteer Ambulance Corps (RTVAC) Riverhead, NY	911 or (631) 727-1686
Hospital-**EMERGENCY** Central Suffolk Hospital Peconic Bay Medical Center	1300 Roanoke Avenue Riverhead, New York 11901	Emergency Rm. (631) 548-6200 Main (631) 548-6000
Occupational Work Care Clinic **NON-EMERGENCY**	Island Urgent Medical Care 1228 East Main Street Riverhead, NY 11901	631-603-3400
Poison Control Center		(800) 222-1222
National Response Center		(800) 424-8802
Dr. Peter Greaney	Work Care (Occupational doctor)	(800) 455-6155
Facility Contact Al Touramina	ECOR Solutions, Inc. NWIRP, Bethpage	Office (516) 346-0344 Cell (516) 702-5861
Lora Fly NAVFAC RPM	NAVFAC MIDLANT	(757) 341-2012
Greg Pearman NAVY RIOCC	NAVFAC	(860) 235-2040
Stavros Patselas Project Manager/Site Superintendent/SSHO	SES-TECH	Office (215) 702-4099 Cell (267) 688-9967
To be determined Alternate SSHO	SES-TECH	Office Cell
Roger Margotto Project Environmental Safety Manger/Program CIH	SES-TECH	Office (619) 471-3503 Cell (619) 988-0520

11.7 Medical Support Plan

See Section 9.0 of this APP.

11.8 Plan for Prevention of Alcohol and Drug Abuse

All contractors and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers and the SSHO are to determine the fitness of their worker's including whether their workers may be under the influence of any drugs or alcohol. This includes over-the-counter medications and prescription medications. At the beginning of the project at the initial site orientation and training all workers are reminded of the program and policies. The policy is also described in the Work Rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them by the SSHO. If a worker is involved in an accident or is injured, the worker(s) involved may be asked to be drug tested. If supervisors observe any worker who appears to be under the influence of drugs or alcohol, they may request testing of the worker. Corporate procedure PP-14 Substance Abuse Program (Previously Drug and Alcohol Abuse) is included in Attachment D.

11.9 Site Sanitation Plan

Workers will discard all food debris and other trash in a designated container. This container will be emptied at least once each week by a licensed waste hauler to an approved residential waste management facility/sanitary landfill.

11.10 Access Haul Road Plan

Not Applicable.

11.11 Respiratory Protection Plan

Not Applicable.

11.12 Health Hazard Control Plan

Health Hazard Control is archived through the AHA. The AHA is a systematic way of identifying the potential health and safety hazards associated with major phases of work. The AHA identifies the methods to mitigate and eliminate exposure to chemical and biological hazards and methods or mitigate exposures to those hazards. The AHA also identifies the necessary equipment, training, and inspections required to control each potential hazard.

The AHAs are developed through task analysis. Task analysis is a detailed, systematic, step-by-step examination of a task to identify all potential loss exposures. The AHAs then provides control measures required to prevent losses for each identified hazard. The control measures section includes references to applicable SES-TECH programs and procedures and should specify equipment, inspections, and training requirements. The AHA is documented in a format, which includes the following elements:

- A Statement that it serves as a certification of hazard assessment;
- A review and approval by a CIH or other competent person;
- Identifies the workplace and activity evaluated;
- Identification of the person certifying the analysis has been performed;
- Identifies the date of the hazard evaluation; and
- Identifies operations, materials, and equipment involving potential exposure to hazardous substances.

At the Site, the following health hazards and controls are addressed in the AHAs:

- Chemical
- Physical
- Biological

AHAs are reviewed with personnel during site specific training/orientation, and/or prior to the initiation of a new phase task.

11.13 Hazard Communication Program

When any material or chemical is brought on to the Site, Material Safety Data Sheets (MSDS) will be provided to the SSHO. A Toxic Material Inventory will be generated and maintained by SSHO.

Only materials brought onto site are covered by Hazard Communication Program. Anticipated materials are listed below.

- Small quantities of gasoline or diesel fuel for equipment (less than 10 gallons)
- Small quantities of various spray cans used for mark-out and equipment maintenance purposes

As part of Initial Site Safety and Health Training/Orientation, the SSHO will review the Hazard Communication Program and MSDS with site workers (if any) and will keep MSDS with the Toxic Materials Inventory on file. MSDS for new products brought on site will be included in tailgate safety and health briefings. All portable containers will be properly labeled as to content and hazards of the material in the container. The corporate procedure EHS 4-2 is used as a reference for Hazard Communication and Training and is included in Attachment D. Additional detailed information pertaining to the Hazard Communication Program is located in the SSHP.

11.14 Process Safety Management Plan

Not Applicable.

11.15 Lead Abatement Plan

Not Applicable.

11.16 Asbestos Abatement Plan

Not Applicable.

11.17 Radiation Safety Program

Not Applicable.

11.18 Abrasive Blasting Plan

Not Applicable.

11.19 Heat/Cold Stress/Temperature Extremes

There is the potential for work to be performed at the Site during temperature extremes. There is a potential for heat stress/cold stress related injuries during work activities at this Site. Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. The corporate procedure EHS 4-6 is included in Attachment D. Additional information pertaining to Heat Stress/Cold Stress/Temperature Extreme is located in the SSHP.

11.20 Crystalline Silica Monitoring Plan

Not Applicable.

11.21 Night Operations Lighting Plan

Not Applicable.

11.22 Fire Prevention Plan

Workers will not fight any fires other than incipient stage fires. The primary work area is outdoors by easement to PRSC driveway. Fires on the Site that could occur would be related to vehicles, equipment malfunctions or poor house-keeping. There will be at least one 10-pound ABC dry chemical fire extinguisher located in the Site superintendent pick-up truck.

The fire extinguishers are intended to fight only fires of the incipient stage and can be reasonably extinguished with one fire extinguisher. In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 seconds to 1 minute. The fire extinguishers have only enough dry chemical agents to extinguish small fires. Prior to fighting any fire or during the course of fighting a fire, the Riverhead Fire Department shall be called by dialing 911.

All areas where flammable gases are stored will be posted as FLAMMABLE, NO SMOKING. Flammable liquids will be stored in an approved flammable liquids storage cabinet.

In the event of a fire or explosion, summon the Riverhead Fire Department immediately (by dialing 911), take a head count, and implement site evacuation procedures. Site personnel should initiate fire suppression with fire extinguishers if safe to do so. Any fire must be reported to the PM and the PESM after notifying emergency services. Additional information pertaining to Fire Prevention is located in the SSHP.

11.23 Wild Land Fire Management Plan

Not Applicable.

11.24 Hazardous Energy Control Plan

The control of hazardous energy will be implemented for underground utilities by implementing the corporate procedure EHS 3-15, Underground Utilities. Corporate procedure EHS 3-15 contains information regarding the identification and marking of underground utilities prior to excavation activities. As part of EHS 3-15 the State of New York One Call System will be contacted and a third party underground geophysical survey will be performed to identify and report for marking any below grade service lines. Corporate procedure EHS 3-15, Underground Utilities, included in Attachment D.

11.25 Critical Lift Plan

Not Applicable

11.26 Contingency Plan for Severe Weather

In the event of severe and/or adverse weather conditions, the SSHO or designee will determine if work can continue without potentially risking the safety of workers. Some of the items to be considered prior to determining if work should continue are:

- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds);
- Limited visibility (fog); or
- Potential for electrical storms.

The SSHO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

11.27 Posting of Emergency Telephone Numbers

Table 11-1 is the list of emergency contact numbers, which will be posted in on site. Additional Emergency Response Plan Information (as defined by 29 CFR 1910.120) is included in Section 12 of the SSHP.

11.28 Float Plan

Not Applicable.

11.29 Site-Specific Fall Protection & Prevention Plan

Not Applicable.

11.30 Demolition Plan

Not Applicable.

11.31 Excavation and Trenching Plan

The control of hazards associated with excavation will be executed using corporate procedure EHS 6-3, Excavation and trenching. Corporate procedure EHS 6-3 contains information regarding the requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems. Corporate procedure EHS 6-3 Excavation and Trenching is included in Attachment D.

11.32 Emergency Rescue (tunneling)

Not Applicable.

11.33 Underground Construction Fire Prevention and Protection Plan

Not Applicable.

11.34 Compressed Air Plan

Not Applicable.

11.35 Formwork and Shoring Erection and Removal Plan

Not Applicable.

11.36 Pre-cast Concrete Plan

Not Applicable.

11.37 Jacking Plan (Lift) Slab Plan

Not Applicable.

11.38 Steel Erection Plan

Not Applicable.

11.39 Site Safety and Health Plan

A separate SSHP, meeting the criteria of EM385-1-1 and of OSHA 29 CFR 1910.120 is included as Attachment A of this APP.

11.40 Blasting Plan

Not Applicable.

11.41 Diving Plan

Not Applicable.

11.42 Confined Space

Not Applicable.

12.0 SITE-SPECIFIC HAZARDS AND CONTROLS RISK MANAGEMENT PROCESSES

12.1 Activity Hazard Analysis

The AHAs for the planned activities are attached and included in the SSHP and are also listed in Table 12-1. If any new tasks are identified or if planned activities vary from the written AHA, the SSHO will develop or alter the existing AHAs with the assistance of the workers to address the specific activities. All AHAs will be reviewed by the PESM.

Table 12-1 Activity Hazard Analysis List

AHA No.	Tasks Requiring AHAs
1	Mobilization (including Site Control/Traffic Control)
2	Subsurface Geophysical and Geographical Survey
3	Install Sediment Control/Silt Fence
4	Excavation and Backfilling
5	Install Water Service Line
6	Hydrostatic Line Testing and Supply Line Disinfection
7	Abandon Groundwater Wells
8	Waste Management (Including Waste Water Sample Collection)
9	Site Restoration and Demobilization (Including Equipment Decontamination)

12.2 Contractor Risk Management Procedures

SES-TECH will meet the applicable sections of EM385-1-1. At a minimum, the corporate procedures listed below meet the minimum requirements and are specifically addressed in the SSHP. This database is available to employees via the internet and hard drive computer files. Additionally, any of these procedures can be obtained by contacting the PESM or the PM.

All corporate procedures that are referenced in this APP are included in Attachment D. Table 12-2 lists the task requirement and the corresponding corporate procedures referred to in the APP.

Table 12-2 Corporate Procedures attached to APP

Requirement	Corporate Procedure
Control of Subcontractors	EHS 1-4: Subcontractor Selection and Management
Accident Reporting	EHS 1-7: Incident Reporting and Investigation
Hazard Communication Program	EHS 4-2: Hazard Communication and Training
Health Hazard Control	EHS 3-15: Underground Utilities
Health Hazard Control	EHS 6-3: Excavation and Trenching Program
Health Hazard Control	PP-14: Substance Abuse Program
Health Hazard Control	EHS 4-6: Temperature Extremes

FIGURES

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Quadrangle Location Map

0 2000 4000 Feet

N

Source: U.S.G.S. Topographic Maps (7.5 Minute)
Wading River, NY Quadrangle

NAVFAC MID–ATLANTIC
Hampton Roads RAO LTM EMAC

NWIRP Calverton, NY
Southern Area
Site 6-A PRSC

Figure 1
Site Location Map

SES - TECH Atlantic

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N

RIVER ROAD

OREGON ROAD (NOT OPEN)

VIRGINIA AVE (NOT OPEN)

KANSAS AVE (NOT OPEN)

CONNECTICUT AVE

PECONIC RIVER

TOWN OF RIVERHEAD

TOWN OF BROOKHAVEN

0’ 200’ 400’ 600’

SES - TECH Atlantic

DSGN: BK
DR: BM
CH ENG:
SUBMITTED BY:
(FIRM MEMBER)
(TITLE)
(DATE)
OFFICER IN CHARGE
DATE
APPROVED
DATE
DESCRIPTION
REV

NAVAL FACILITIES ENGINEERING COMMAND

DEPARTMENT OF THE NAVY

NAVFAC Mid-Atlantic

389 RIVER RD CALVERTON NY

SUFFOLK COUNTY, NEW YORK

INSTALLATION OF WATER SERVICE
TO PECONIC RIVER SPORTSMAN’S CLUB

SITE LAYOUT

SEAL AREA

SAT TO DATE

CODE I.D. NO.

SCALE : AS SHOWN

SPEC. NO.

CONSTRN. CONTR. NO.
N40085-11-D-0043

NAVFAC DRAWING NO.

SHEET OF

SIZE: D

DIS. SH. NO. Figure 2

4400-FIGURE-2.DWG

P:\Hampton Roads EMAC\CADD-GIS\Calverton\Calverton 6A PRSO\Drawings\4400-Figure-2.dwg

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mapquest

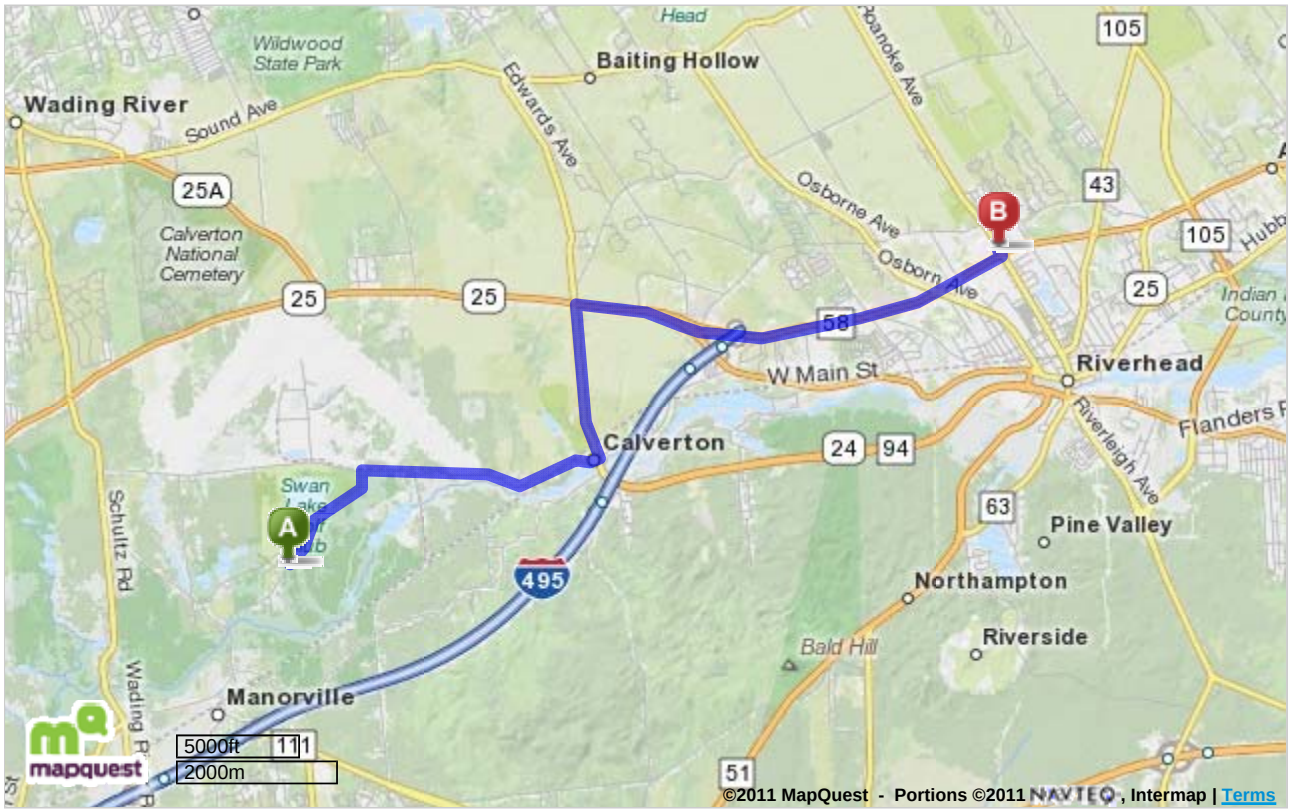
Trip to:
1300 Roanoke Ave
Riverhead, NY 11901-2031
8.93 miles
15 minutes

Notes

Figure 3 - Route Map to Central Suffolk Hospital

A		**389 River Rd** Manorville, NY 11949-1405	**Miles Per Section**
●		1. Start out going **northeast** on **River Rd** toward **Old River Rd**.	**Go 1.2 Mi**
↱		2. Turn **right** to stay on **River Rd**.	**Go 2.2 Mi**
↰		3. Turn **left** onto **Edwards Ave**. *Edwards Ave is 0.1 miles past Canoe Lake Dr* *If you reach Hill St you've gone about 0.5 miles too far*	**Go 1.4 Mi**
↱	EAST 25	4. Turn **right** onto **RT-25 E / Middle Country Rd**. *If you reach Riley Ave you've gone about 0.1 miles too far*	**Go 1.0 Mi**
↑		5. Stay **straight** to go onto **CR-58 E / Old Country Rd**.	**Go 3.0 Mi**
↱		6. Enter next roundabout and take the 3rd exit onto **Roanoke Ave**.	**Go 0.10 Mi**
■		7. **1300 ROANOKE AVE** is on the **right**. *Your destination is just past CR-58 W* *If you reach Middle Rd you've gone about 0.2 miles too far*	
B		**1300 Roanoke Ave** Riverhead, NY 11901-2031	**8.9 mi**

Total Travel Estimate: **8.93 miles - about 15 minutes**



mapquest

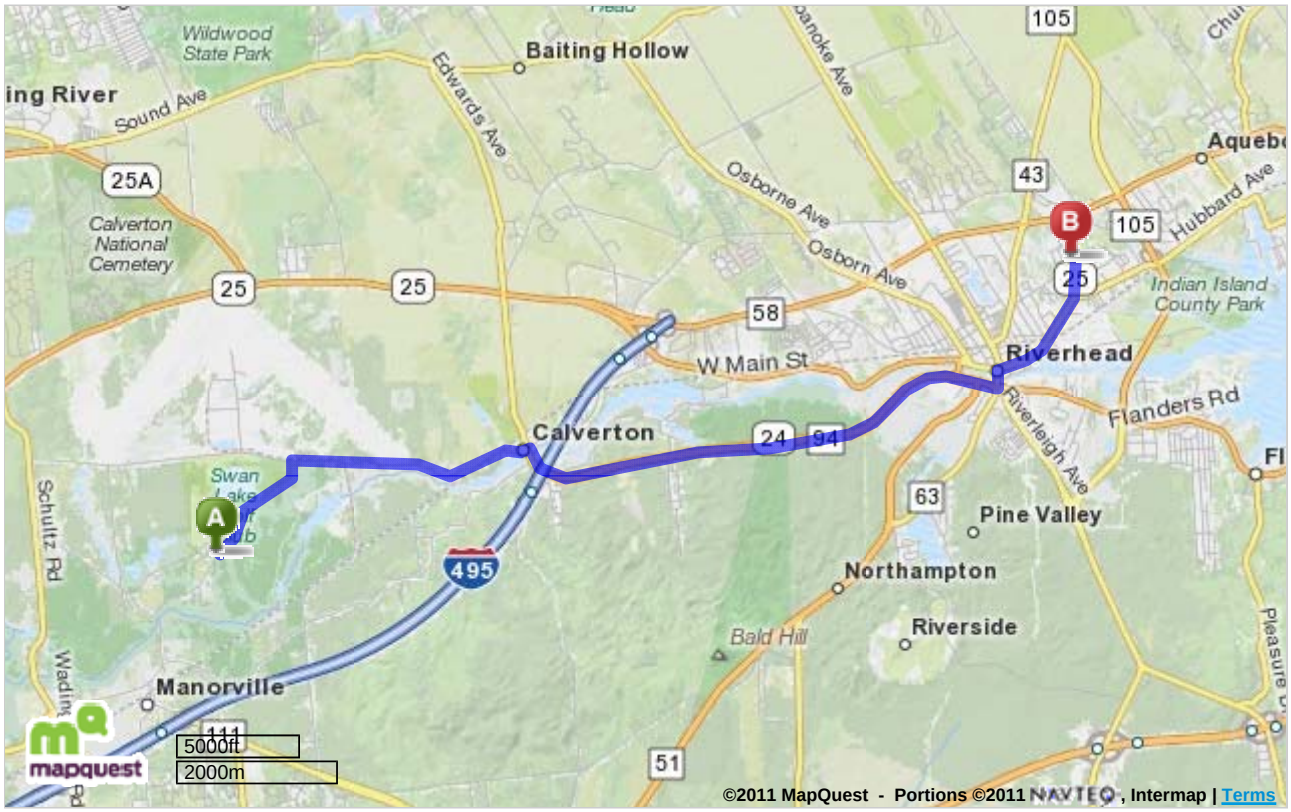
Trip to:
1228 E Main St
Riverhead, NY 11901-2675
9.49 miles
18 minutes

Notes

Figure 4 - Route Map to Occupational Work Care Clinic

A		**389 River Rd** Manorville, NY 11949-1405	**Miles Per Section**
●		1. Start out going **northeast** on **River Rd** toward **Old River Rd**.	**Go 1.2 Mi**
↱		2. Turn **right** to stay on **River Rd**.	**Go 2.2 Mi**
↱		3. Turn **right** onto **Edwards Ave**. *Edwards Ave is 0.1 miles past Canoe Lake Dr* *If you reach Hill St you've gone about 0.5 miles too far*	**Go 0.5 Mi**
↑	EAST 24	4. **Edwards Ave** becomes **RT-24 E / CR-94 E**.	**Go 4.1 Mi**
↗		5. Enter next roundabout and take the 4th exit onto **Peconic Ave**.	**Go 0.2 Mi**
↱	25	6. Turn **right** onto **W Main St / RT-25**. *Word of Life Ministries is on the right*	**Go 1.3 Mi**
■		7. **1228 E MAIN ST** is on the **left**. *Your destination is just past Sunrise Ave* *If you reach Segal Ave you've gone a little too far*	
B		**1228 E Main St** Riverhead, NY 11901-2675	**9.5 mi**

Total Travel Estimate: **9.49 miles - about 18 minutes**



Attachment A

Site Safety and Health Plan

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION OPERERATIONS (RAO)/LONG TERM MANAGEMENT (LTM),
ENVIRONMENTAL MULTIPLE AWARD CONTRACT (EMAC)
CONTRACT NO. N40085-11-D-0043
TASK ORDER NO. 0002

FINAL
SITE SAFETY AND HEALTH PLAN
FOR
INSTALLATION OF WATER SERVICE TO PECONIC RIVER SPORTSMAN'S CLUB
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
CALVERTON, NEW YORK

Issued:

April 26, 2012

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Norfolk, VA 23511-3095

Prepared by:

SES–TECH Atlantic
5700 Lake Wright Drive
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Revision:	Date:	Prepared by:	Approved by:	Approved by:
0	April 26, 2012	C. Joblon	R Margotto, CIH	S. Pataselas.

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APPROVALS

By their signature, the undersigned hereby certify that this Site Safety and Health Plan (SSHP) has been reviewed and approved for use at the Peconic River Sportsman Club Site, Calverton, New York.

PROGRAM MANAGER		
Signature	 Peter McCormick PLAN APPROVAL	**4/26/12** **DATE**
PROJECT MANAGER/ SITE SAFETY AND HEALTH OFFICER		
Signature	 Stavros Patselas PLAN APPROVAL	**4/26/12** **DATE**
ALTERNATE SITE SAFETY AND HEALTH OFFICER		
Signature	 Christine Joblon PLAN PREPARER	**4/26/12** **DATE**
PROJECT ENVIRONMENTAL SAFETY MANAGER		
Signature	 Roger Margotto PLAN APPROVER	**4/26/12** **DATE**

SES-TECH AND NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC (NAVFAC MIDLANT) DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS THAT MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINTATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

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ABBREVIATIONS AND ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
APP	Accident Prevention Plan
BZ	breathing zone
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
CO	Contracting Officer
COR	Contracting Officer's Representative
CRL	Corporate Reference Library
CRZ	Contamination Reduction Zone
EHS	Environmental, Health and Safety
EM	Engineering Manual
EMAC	Environmental Multiple Award Contract
ERP	Environmental Restoration Program
ESQ	Environmental, Safety and Quality
ESS	Environmental Safety Supervisor
EZ	Exclusion Zone
FCR	Field Change Request
H&S	Health and Safety
LEL	Lower Explosive Limit
LTM	Long Term Monitoring
NAVFAC MIDLANT	Naval Facilities Engineering Command Mid-Atlantic
NTCRA	Non-Time Critical Removal
NWIRP	Naval Weapons Industrial Reserve Plant
NYDEC	New York State Department of Environmental Conservation
O_2	Oxygen
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PESM	Project Environmental Safety Manager
PID	photo-ionization detector
PM	Project Manager
ppe	personal protective equipment
ppm	parts per million
PRSC	Peconic River Sportsman Club
RAO	Remedial Action Operation
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
RPM	Resident Project Manager
SCDHS	Suffolk County Department of Health Services
SES	Sealaska Environmental Services, LLC
SES-TECH	SES-TECH Atlantic
SSHO	Site Superintendent/Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	Support Zone
The Site	Site
TLV	Threshold Limit Value

TtEC	Tetra Tech EC, Inc.
USACE	US Army Corps of Engineers
VOCs	volatile organic compounds
ZIP®	Zero Incident Performance®

1.0 INTRODUCTION

1.1 Purpose

The planned Non-Time Critical Removal (NTCRA) will be performed by SES-TECH Atlantic (SES-TECH), a joint venture between Sealaska Environmental Services, LLC (SES) and Tetra Tech EC, Inc. (TtEC) under the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC MIDLANT) Remedial Action Operation (RAO) Long Term Monitoring (LTM) Environmental Multiple Award Contract (EMAC).

This Site Safety and Health Plan (SSHP) addresses the appropriate Environmental, Health and Safety (EHS) practices that will be employed by workers participating in activities at the Peconic River Sportsman Club (PRSC) Site (the Site), Calverton, New York. The Site is associated with the Southern Area Plume located at the Naval Weapons Industrial Reserve Plant (NWIRP) Calverton. The SSHP presents procedures to be followed by SES-TECH, its subcontractors, site visitors, and all other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. Activities performed under this SSHP will comply with Occupational Safety and Health Association (OSHA) Regulations 29 CFR Parts 1910 and 1926, USACE EM385-1-1 and the Health and Safety (H&S) program. A control copy of the EHS program is available as part of the Corporate Reference Library (CRL).

The SSHP is prepared under the direction of a Certified Industrial Hygienist (CIH) [i.e., Project Environmental Safety Manager (PESM)] and the controls and procedures specified in the SSHP may only be terminated or modified by the PESM/Program CIH when hazards at the site have been eliminated. Modifications to the SSHP may be made with the approval of the PESM for this project using the Field Change Request (FCR) form found in Appendix A. This SSHP is an attachment to the Accident Prevention Plan (APP), which was prepared in accordance with US Army Corps of Engineers (USACE) Engineering Manual EM385-1-1.

1.2 Scope

This SSHP has been developed as a project EHS overview to address the identified health and safety concerns during activities at the Site.

1.3 Project Description and Scope of Work

A non-time-critical removal action (NTCRA) is being conducted to eliminate human health risks associated with exposure to volatile organic compounds (VOCs) in groundwater within the Off-Site Southern Area, including the PRSC facility. This action is being conducted by the Navy under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulatory frameworks with oversight by the New York State Department of Environmental Conservation (NYSDEC).

As a part of this NTCRA, the existing Riverhead Water District water main was previously extended to the east so that potable water service can be provided to current (i.e., PRSC) and future occupants. An 8-inch diameter ductile iron water line was extended 4,400 feet from its current termination to a point approximately fifty feet east of the PRSC access road. A valve was installed at the new pipeline termination to allow for future expansion of the system.

The NTCRA also consists of water service line connection for PRSC to the new water supply main near the PRSC access road. The water service line installation is the scope of work (SOW) covered under this SSHP. The water service line will extend approximately 1,500 feet adjacent to the access road to the PRSC. From there, individual water pipes will branch off to each building currently or formerly supplied with well water (i.e., Main Lodge, Activities Center, residence, and pistol range trailer).

This SSHP applies to all personnel involved in the tasks who wish to gain access to active work areas, including but not limited to:

- SES-TECH employees and subcontractors;
- Client representatives – NAVFAC is responsible for ensuring that its personnel and third party monitors comply with OSHA and USACE EM385-1-1 applicable requirements;
- SES-TECH subcontractors will develop activity hazard analyses that will be reviewed and approved by SES-TECH prior to start of work.

1.4 Scope

The objective of the construction activity is to install a water service line at the PRSC Site. Because of the potential exposure to groundwater contamination from the groundwater wells at PRSC, an alternative groundwater supply is needed. Water service installation work will be performed while not disrupting PRSC operations including driveway traffic.

The PRSC Site soils are considered to be free of contamination and all soil work will be conducted as utilizing clean construction protocols and methodologies. The potential to encounter contaminated groundwater will occur during the abandonment of four of the groundwater supply wells currently servicing PRSC facilities.

SES-TECH will provide the materials, equipment, and manpower to complete the installation of a potable drinking water supply to the PRSC. The following major activities will be performed during the PRSC Water Service Installation Project:

- Mobilization, including site control/traffic control) (AHA #1);
- Subsurface geophysical and geographical survey (AHA #2);
- Install sediment control/silt fence (AHA #3);
- Excavation (trench) to a depth of five feet and backfilling (AHA #4);
- Install two-inch HDPE water service line (AHA #5);
- Hydrostatic line testing and supply line disinfection (AHA #6);
- Abandon four (4) groundwater wells (AHA #7);
- Waste management, including waste water sample collection) (AHA #8); and
- Site restoration and demobilization, including equipment decontamination) (AHA #9).

1.4.1 Mobilization (Including Site Control/Traffic Control) - AHA #1

Activities will include delivery of personnel, equipment and materials to perform the construction activities. The Site is open to public access, access to the work areas or staging areas will be controlled with signage and barriers as needed. Site security will not be provided.

Traffic controls will be implemented so that field activities can be completed in an efficient and safe environment. Since some work is occurring on the ingress/egress road for the PRSC, traffic patterns may

be disrupted. SES-TECH will identify when access issues may occur and will work with the Navy and PRSC facility personnel, if acceptable to the Navy, to ensure that work will impact PRSC activities as little as possible. Traffic flow requirements, vehicle turn-around areas, and material staging areas will be identified through discussion with the Navy, and access issues will be communicated to site workers through daily briefings. A flagman will be used to control traffic flow, when needed. Additional details on traffic control are included in Section 8.0 of this SSHP.

1.4.2 Subsurface Geophysical and Geographical Survey – AHA #2

An underground utility clearance will consist of a geophysical survey and contacting the one call service to confirm underground utility clearance prior to any intrusive activities. Any existing underground utilities in the vicinity of excavation areas will be marked with appropriate utility color code.

Prior to excavation, the estimated limits of excavation for the water service line installation may be surveyed and marked in the field. A post-construction survey will be performed to provide as-built documentation of construction efforts.

1.4.3 Install Sediment Control/Silt Fence – AHA #3

Soil erosion and sediment controls, consisting primarily of silt fence, will be installed in accordance with Storm Water Pollution Prevention Plan and Soil Erosion and Sediment Control Plan provided by Navy.

1.4.4 Excavation and Backfilling – AHA #4

Trench excavation will be performed using a mini-excavator type equipment with a 12-inch wide bucket in order to minimize the work area to avoid restricting any PRSC driveway traffic. Trench excavation to a 5-foot depth will commence away from the reduced pressure zone (RPZ) and toward the PRSC driveway.

Certified clean sand for pipe bedding will be imported and used 4-inches above and below the installed 2-inch HDPE pipe. The trench will then be backfilled with the excavated material (native) material and compacted in lifts. Compaction testing will be conducted. Roadway crossings only will be backfilled in 8-inch lifts and compacted to achieve 95% modified proctor density. Backfill will be graded to meet existing grade.

It is anticipated that soils excavated during trenching activities will not be contaminated and will be used as backfill in the trenches. No chemical testing of the soil will be performed. Though not anticipated, the soils will be visually inspected for staining or other signs of contamination. If encountered, SES-TECH will notify the Navy of the findings.

1.4.5 Install Water Service Line - AHA # 5

The new water line will cross the driveway and then be installed along the eastern edge of the driveway toward the pistol range. The trench pathway will be directed to minimize the removal of tree branches.

All trenching will not be completed at the same time. A limited length of trench will be excavated, then water service line (2-inch HDPE) piping will be connected and laid, and finally backfill of the limited area will be completed. Trenching will then commence along the pathway in the next limited area. This will avoid large open excavation areas and limit the area of disturbance.

1.4.6 Hydrostatic Line Testing and Supply Line Disinfection - AHA #6

The new water line will be hydrostatically tested and disinfected prior to connection to existing facility feeds. A pressure of 150 psig will be maintained for a minimum of two hours. The water line will then be disinfected with chlorine solution and flushed. The diluted chlorine solution and flush water mixture will be directed and drained below ground surface or to an above ground surface area away from any surface water body and pre-approved by PRSC. Water line bacterial testing will also be completed.

1.4.7 Abandon Groundwater Wells – AHA #7

Well abandonment will be performed by a well driller licensed in the State of New York and in accordance with applicable well abandonment regulations. SES-TECH will obtain a drilling subcontractor to perform the well abandonment.

It is anticipated that the well water may contain chlorinated solvents associated with the groundwater contaminant plume. Displaced water will be contained around the well head and then containerized in 55-gallon steel drums for waste classification and off-site disposal. Drilling equipment and removed well pumps will be decontaminated with a potable water rinse. Decontamination fluid will be collected and containerized with the displaced water generated during the well abandonment. A sample will be collected for waste classification as per the Work Plan.

1.4.8 Waste Management (Including Waste Water Sample Collection) – AHA #8

Waste management will consist of the segregation, waste classification, storage and handling of waste materials including waste water, trash, PPE and construction debris. SES-TECH will collect and dispose of all waste as per the Work Plan.

A sample of the waste water will be collected for waste classification as per the Work Plan. A clean bottle or a drum thief will be lowered into the container and the contents will be placed into the appropriate labeled sample bottles.

1.4.9 Site Restoration and Demobilization (Including Equipment Decontamination) – AHA #9

Disturbed ground surfaces will be restored to original or better condition. After backfill completion, the driveway crossing areas will be capped with ¾-inch gravel or recycled concrete aggregate and land cover areas capped and slightly mounded with native material. Land cover areas will be seeded and/or planted with trees/shrubs.

Demobilization will consist of dry decontamination of equipment that was used to conduct the NTCRA. Summary of Major Risks

- Exposure to uncontrolled energy or utilities;
- Exposure to Heavy Equipment (struck-by); and
- Exposure to Traffic Hazards.

1.5 Zero Incident Performance®

Zero Incident Performance® (ZIP®) describes our approach and expectations for both safety and project execution. We will achieve this level of performance excellence through teamwork and partnering with our client and our Subcontractors, and through the participation of every person on this project.

We (SES-TECH and our client) believe that:

"All incidents are preventable through proper planning, tasking, and execution of plans as written. Any goal besides Zero Incident Performance® is unacceptable and sends the message that incidents cannot be prevented."

In addition, an incident includes an event which could have resulted in one of these outcomes had the circumstances been different ("near miss").

Each person on this project is individually responsible and accountable for their safety performance. Active participation by all personnel is required in order to achieve ZIP®. This includes SES-TECH personnel and subcontractor personnel. If any incident does occur, it must be reported and investigated to identify root causes, take corrective actions and communicate the lessons learned.

Subcontractors, after contract award, shall be required to attend a health and safety orientation. This meeting will involve the Subcontractor's key personnel, and will cover ZIP® expectations.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the SES-TECH project organization.

Program Manager-Peter McCormick

SES-TECH personnel involved in the project include:

- Project Manager (PM)/Project Engineer/Site Superintendent/Site Safety and Health Officer (SSHO) – Stavros Patselas
- Project Environmental Safety Manager (PESM) – Roger Margotto
- Alternate SSHO – to be determined
- Site Personnel – SES-TECH employees
- Site Personnel – Subcontractor employees

Names and positions for key project personnel are defined below.

2.1 Project Manager

The SES-TECH Project Manager (PM) is Mr. Stavros Patselas. Mr. Patselas' responsibilities include the following:

- Has overall project responsibility for project environmental, health and safety.
- Ensures implementation of this program through coordination with the responsible PESM.
- Ensures that field work is scheduled with adequate personnel and equipment resources to complete the job safely.
- Ensures that field site personnel are adequately trained and qualified to work at the site.
- Investigates and approves incident/accident reports.
- Ensures the SSHP has all of the required approvals before site work is conducted.

- Ensures that the PESM or SSHO is informed of project changes which require modifications of the SSHP.
- Ensures that inspections are conducted.
- Ensures Site competent person requirements are met.

The PM for the PRSC Site is:

Mr. Stavros Patselas
820 Town Center Drive, Suite 100
Langhorne PA 19047
Office - (215) 702-4099
Cell - (215) 688-9966
stavros.patselas@tetratech.com

2.2 Project Site Safety and Health Manager

The PESM is a senior Environmental, Safety and Quality (ESQ) staff member with experience in hazardous waste site remediation activities. The SES-TECH PESM for the PRSC Site is Mr. Roger Margotto CIH, CSP. Mr. Margotto's responsibilities include the following:

- Provide for the development and approval of the SSHP.
- Serve as the primary contact to review health and safety matters that may arise.
- Approve revised or new safety protocols for field operations.
- Approve individuals who are assigned SSHO responsibilities.
- Approve SSHO to fulfill other project roles.
- Coordinate revisions of this SSHP with field personnel.
- Coordinate upgrading or downgrading of personal protective equipment with the SSHO.
- Assist in the investigation of all accidents.

The PESM for the PRSC Site is:

Mr. Roger Margotto, CIH, CSP
Tetra Tech EC, Inc.
1230 Columbia St., Suite 750
San Diego, CA 92101-8536
Office: (619) 471-3503
Cell: (619) 988-0520
roger.margotto@tetratech.com

2.3 SiteSafety and Health Officer (SSHO)

The SiteSafety and Health Officer (SSHO) will be present during the conduct of site operations and possesses the knowledge and experience necessary to implement all elements of the approved plans. In accordance with the contract requirements, the Project will be staffed with one full time Site Superintendent/SSHO. The SES-TECH SSHO is for the PRSC Site is Mr. Stavros Patselas.

The SSHO for the PRSC Site is:

Mr. Stavros Patselas
820 Town Center Drive, Suite 100
Langhorne PA 19047
Office - (215) 702-4099
Cell - (215) 688-9966
stavros.patselas@tetratech.com

The SSHO qualifications for this project include a minimum five years of experience and the successful completion of the SES-TECH Environmental Safety Supervisor (ESS) Course. This course includes completion of 30 hours of web-based training in Construction Safety (and 16 hours of instructor led training by senior EHS staff). The SSHO requirements also include the completion of 40-hour HAZWOPER training and annual 8-hour HAZWOPER refresher training.

Mr. Patselas' responsibilities include the following:

- Executes the means for control of subcontractors as described in Section 5.2 of the APP.
- Ensures that site personnel provide adequate and applicable training documents certifying an individual's qualification to work at the site.
- Ensures that all health and safety activities identified in the SSHP are conducted and monitors compliance with the SSHP.
- Conducts pre-task safety and health analysis
- Conducts and documents safety briefings and site orientations (when necessary)
- Ensures that monitoring instruments are calibrated and maintains health and safety field log books.
- Performs air monitoring per the requirements of this SSHP.
- Directs and coordinates health and safety monitoring activities, and ensures that proper personal protective equipment is utilized by field teams
- Upgrades or downgrades of personal protective equipment (PPE) based on site conditions and/or real-time monitoring results.
- Identifies operational changes which require modifications to health and safety procedures and the SSHP, and ensures that any procedure modifications are approved by PESM and documented.
- Conducts weekly and monthly inspections and reports to PESM to provide summaries of field operations and progress
- Performs emergency coordinator duties and ensures that adequate emergency response preparation and procedures and emergency response equipment is maintained.
- Notifies PESM of applicable accidents/incidents and coordinates with PM in conducting investigation

2.4 Alternate Site Safety and Health Officer

The Alternate SSHO is to be determined. The Alternate SSHO will substitute for the SSHO when the SSHO is not on-site and will be present during the conduct of operations. The Alternate SSHO possesses the knowledge and experience necessary to implement all elements of the approved plans. The qualifications of the Alternate SSHO are the same as those for the SSHO and include a minimum 5 years of experience and the successful completion of the SES-TECH ESS Course. This course includes completion of 30 hours of web-based training in Construction Safety (and 16 hours of instructor led

training by senior EHS staff member). The SSHO requirements also included the completion of the 40-Hour HAZWOPER training and annual 8-hour HAZWOPER refresher training.

The Alternate SSHO for the PRSC Site is: To be determined.

The Alternate SSHO will implement this APP and the SSHP in the field. The Alternate SSHO authority and responsibilities are the same as those of the SSHO.

2.5 Site Personnel/Work Parties

Responsibilities of Site Personnel/Work Parties include the following:

- Report any unsafe or potentially hazardous conditions to SSHO.
- Maintain knowledge of the information, instructions and emergency response actions contained in the SSHP.
- Comply with rules, regulations and procedures as set forth in this SSHP and any revisions.
- Prevent admittance to work sites by unauthorized personnel.
- Inspect all tools and equipment, including PPE, daily prior to use.
- Act as safety leaders.
- Implement ZIP® procedures.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Site Location

NWIRP Calverton is located in Suffolk County, Long Island, NY, within the municipality of Riverhead. The Navy has owned all or parts the facility since the early 1950s, when the property was collectively purchased from private owners. Various parcels of land have since been transferred to other parties (e.g., the Veterans Administration, the NYSDEC, and the Town of Riverhead). The facility currently covers approximately 207 acres of the original 6,000-acre facility. The Navy retains portions of the facility (i.e., parcels of land) associated with Environmental Restoration Program (ERP) sites currently under investigation and remedial decision/action processes.

The PRSC is located off of River Road in Manorville, NY (Figure 1). It is located along the banks of an un-named pond created by a dam across the Peconic River. The PRSC includes a Main Lodge, Activities Center, a private residence, and pistol, rifle, and archery ranges. Figure 2 shows the Site Layout.

3.2 Project Background and Site Description

3.2.1 General Background

NWIRP Calverton was used for the development, assembly, testing, refitting, and retrofitting of Naval combat aircraft. The government owned, contractor operated facility supported aircraft design and production at nearby NWIRP Bethpage. Northrop Grumman Corporation operated the facility until 1996. The majority of industrial activities at the facility were confined to the developed area in the central and south-central portions of the facility. Hazardous waste generation at the facility was related to metal finishing processes (e.g., metal cleaning and electroplating). Currently, there are no operational activities

or process-type operations being conducted at NWIRP Calverton that could generate hazardous waste nor are there any requirements for storage of hazardous materials on the Navy's property.

Three individual wells provide water to the Main Lodge, Activities Center, and the private residence. In 2001, routine monitoring of PRSC water supplies by Suffolk County Department of Health Services (SCDHS) detected chlorinated solvent-type VOCs in one of the wells on the PRSC property. Based on these detections, the well at the Pistol Range Trailer was shut-down and PRSC installed a granular activated carbon treatment system on the water supply well for the Activity Center in 2007.

3.2.2 Southern Area Background

The Southern Area begins within NWIRP boundaries to the southeast of Site 10B (Engine Test House) and extends off site to the southeast. This area is hydraulically down-gradient of Site 10B, Site 6A (Fuel Calibration Area), and the general industrial complex at the facility. Groundwater flow through this area is to the southeast, with the Peconic River being the discharge point.

The Southern Area is mostly wooded and includes two shallow ponds near the northern edge. The ponds receive runoff through a drainage swale and culvert from Site 6A. From the late 1980s to the early 1990s, groundwater from Site 6A was discharged into this drainage swale and culvert and into the western pond. As a result, the presence of chlorinated VOC-contaminated groundwater in the Southern Area may be attributable to Site 6A.

3.2.3 Peconic River Sportsman Club Background

The PRSC is located at the southern end of the Southern Area plume. The PRSC is located along the banks of an un-named pond created by a dam across the Peconic River. The PRSC includes a Main Lodge, Activities Center, a private residence, and pistol, rifle, and archery ranges. Three individual wells provide water to the Main Lodge, Activities Center, and the private residence. A well at the pistol range was shut down because of VOC contamination. Fire protection is provided by a fifth high capacity well.

Contaminants that have been detected in PRSC wells include 1,1-DCA, 1,1-DCE, cis-1,2-DCE, TCE, vinyl chloride, chloromethane, isopropylbenzene, and methyl tert-butyl ether. The concentration of DCA is greater than the NYSDOH MCL in only one well.

Because of the potential exposure to groundwater contamination at PRSC, a water service line will be installed to provide the PRSC with water. Because the fire protection well is only used intermittently and does not present an unacceptable human health exposure risk, no action is proposed for the fire protection well.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the remedial activities. Additional information pertaining to potential hazards can be found this SSHP within Appendix B - Activity Hazard Analyses (AHAs).

4.1 Properties of Chemical Contamination

Due to the nature of the work being performed, the anticipated levels of exposure to potential site contaminants are low. The primary contaminants of concern anticipated in the groundwater generated

during the well abandonment are 1,1,1 DCA and 1,1,1 DCE. Historical data indicates that at both 1,1,1 DCA and 1,1,1 DCE are at low concentrations. During the well abandonment activity, there is a potential for skin contact and/or inhalation with the chemical contaminants. The primary route of exposure for these compounds is skin contact, inhalation and ingestion.

Air monitoring will be conducted during the well abandonment activity. A photo-ionization detector (PID) will be used to measure the concentration of VOCs in the personnel breathing zone above the well headspace. The action level of VOC concentrations as measured by the PID is 10 ppm. Refer to Section 7.0 for additional information on air monitoring.

4.2 Biological Hazards

During the course of the project, there is a potential for workers to encounter biological hazards such as animals, insects and plants.

4.2.1 Animals

During site operations, animals such as dogs, cats, raccoons, skunks, mice, and snakes may be encountered. Workers will use discretion and avoid all contact with animals.

4.2.2 Insects

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents (i.e. DEET for ticks) when working in areas where insects are expected to be present.

4.2.2.1 Lyme Disease

Lyme disease is caused by an infection from a deer tick that is about the size of the head of a pin. After a blood feeding, the tick becomes engorged and may vomit its stomach contents into the host, a microorganism (spirochete) may be transmitted into the bloodstream. The feeding time is 24 to 48 hours. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from two days to two weeks. In most cases, the infected area will resemble a red bull's eye with concentric rings. Within the same period, flu-like symptoms may develop. If left untreated, the red ringed area will eventually fade and Lyme disease may further develop into an arthritis-like condition.

The best method for stopping insect borne disease is to avoid the bite. Control measures to prevent Lyme Disease include the following:

- Avoid dense or high brush, when possible;
- Wear light colored clothing;
- Spray DEET on your skin and Permethrin on clothing and work boots;
- Tuck pant legs into socks and shirts into gloves, if possible;
- Self/Buddy check of neck, hairline, groin and body after working in areas that may contain deer ticks;
- Wear light colored Tyvek or clothing;
- Wear booties over work boots;
- Look for ticks upon returning from field work;
- Shower as soon as possible;

- If a tick is found, suffocate it with baby oil applied to the tick, then remove it by pulling gently at the head with tweezers ;
- Report any of the above symptoms and all tick bites to the SSHO for evaluation. Employees bitten by deer ticks during the course of employment or one who finds an engorged tick on their body, will be given a medical examination; and
- Analysis of the tick for Spirochete may be warranted. Administration of antibiotic therapy may be warranted. Either action may be taken with the concurrence of the Corporate Medical Consultant.

4.3 Physical Hazards

This section addresses Physical hazards. Physical hazards are also discussed in the AHAs provided in Appendix B.

4.3.1 Cold Stress

In preventing cold stress, the SSHO must consider factors relating both to the worker and the environment. Training, medical screening, establish of administrative controls, selecting proper work clothing, and wind-chill monitoring all contribute to the prevention of hypothermia and frostbite.

The corporate procedure EHS 4-6 describes the Temperature Extremes Program.

The following are the main elements of the SES-TECH Health and Safety Program related to temperature extremes.

- PPE (i.e. hard hat liners, boot and glove liners, insulated coveralls, etc);
- Engineering controls (i.e. heaters);
- Administrative controls (i.e. work/warm up schedule, acclimatization);
- Recognition of cold stress related injury (frostbite and hypothermia);
- Warm rest area; and
- Employee training.

Some tasks will be performed in the fall and winter. Workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot (or immersion foot) and hypothermia.

Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction.

The three general categories of frostbite are:

Frost Nip - A whitened area of the skin which is slightly burning or painful.

Superficial Frostbite - Waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels “warm” to the victim with a notable cessation of pain.

Deep Frostbite - Tissue damage deeper than the skin, at times, down to the bone. The skin is cold, numb and hard.

4.3.2 Heat Stress

There is a potential for heat stress and related injuries during work activities. Specific potential hazards include:

- Heat rash;
- Heat cramps;
- Heat syncope;
- Heat exhaustion; and
- Heat stroke.

Sweating does not cool the body unless the sweat evaporates. Heat stress related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Heat rash occurs because sweat is not evaporating, causing irritation and vesicular inflammation. Standing erect and immobile in the heat allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur. Heat cramps are painful spasms of the muscles due to excessive water and salt loss from profuse sweating. Similarly, heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. Heat exhaustion is characterized by clammy and moist skin, nausea, dizziness, headaches, and low blood pressure.

Heat stroke occurs when the body's temperature regulatory system has failed. Skin is hot, dry, red, and spotted. The affected person may be mentally confused, delirious, and convulsions may occur. A person exhibiting signs of heat stroke should be removed from the work area and moved to a shaded area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately.

IMPORTANT: EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.

Early symptoms of heat stress related problems include the following:

- Decline in task performance;
- Lack of coordination;
- Decline in alertness;
- Unsteady walk;
- Excessive fatigue;
- Muscle cramps; and
- Dizziness.

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses.

To avoid heat stress, the following steps, as necessary, will be implemented at the DSCP site:

- Adjust work schedules:

  - Modify work/rest schedules according to monitoring requirements.
  - Mandate work slowdowns as needed.
- Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Perform physiological monitoring.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure the cardiovascular system functions adequately.

Daily fluid intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces [0.23 kilograms (kg)] of weight loss.

The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more.

The following strategies may be useful:

- Maintain water temperature at 50° to 60°F (10°-16.6°C).
- Provide small disposable cups that hold about 4 ounces (0.1 liter).
- Have workers drink 16 ounces (0.5 liters) of fluid, preferably water or dilute drinks, before beginning work.
- Urge workers to drink fluids every 15 to 20 minutes, or at each monitoring break.
- A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
- Train workers to recognize the symptoms of heat-related illnesses.
- Rotate personnel and alternate job functions.
- Utilize cooling vests when impermeable clothing is worn.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment. A general rule is to wear hearing protection if you cannot hear normal conversation within an arm length of the person talking. Hearing protection must be worn if noise levels are above the following decibel (dBA) ratings:

- 84 dBA – 8-hour time weighted average
- 100 dBA – 15 minute short-term exposure limit
- 140 dBA – instantaneous noise

4.3.4 Power Hand Tools

Workers must learn to recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent injuries from those hazards. To prevent accidents resulting from the use of hand and power operated hand tools, the following safe work practices will be implemented and enforced.

Broken, defective, burned, or mushroomed tools will not be used. They will be reported and turned in for replacement. The proper tool and equipment will be selected and used for each task. The practice of throwing tools from one location to another, from one employee to another, or dropping them to lower

levels will be prohibited. When it is necessary to pass tools or material under the above conditions, suitable containers and/or ropes must be used.

Electric tools – Electric tools present several dangers to the user; the most serious is the possibility of electrocution. The following safe work procedures for electric tools must be implemented and enforced. Tools must:

- Have a three-wire cord with ground and be grounded;
- Be double-insulated; and
- Be powered by a low-voltage isolation transformer.

Never remove the third (grounding) prong from the plug end. Electrical tools will not be used in damp or wet locations and will always be used within their design limitations. A ground fault circuit interrupter (GFCI) must be used or the tool must be double insulated to protect the worker from electrical shock hazards. However, gloves will not be worn when they are potential entanglement hazards with reciprocating or rotating tools.

4.3.5 Fires

Personnel will make every effort possible to reduce the amount of combustible materials present and eliminate fire sources. Fire prevention and protection measures require preplanning. At least one 10-pound dry chemical ABC fire extinguisher will be located in the primary work area. Areas away from primary project work area will be covered by fire extinguishers inside the cab of pickup trucks. Pick-up/site vehicle fire extinguishers shall be a minimum of 2 ½ -pound dry chemical ABC and must be mounted or secured. Employees will follow safe work practices to include proper storage of flammable and combustible liquids. Smoking is not permitted.

All areas where flammable gases are stored shall be posted as FLAMMABLE, NO SMOKING. All other flammable liquids will be stored in an approved storage cabinet unless they are for immediate use.

No refueling will be performed unattended (latch-on fueling hoses are prohibited). No smoking is authorized in any areas where refueling is performed.

In the event of a fire or explosion, summon the immediately (by dialing 911), take a head count, and implement site evacuation procedures. Site personnel should initiate fire suppression with fire extinguishers if safe to do so and the SSHO shall be notified. Any fire must be reported to the PM and the PESM after notifying emergency services.

The person reporting the fire is required to provide the following information:

- His/her name;
- Location of the fire and facility number, if known;
- Number of injured personnel and nature of injuries, if known;
- Substance(s), chemical(s) or materials involved in the fire;
- Size of the fire and available fuel (estimate);
- Extent of fire;
- Rate that the fire is expanding (estimate);
- Time the fire started and the time the fire was extinguished; and
- Any other pertinent information.

The client, in coordination with the PM, will manage notifications to regulatory agencies. In addition, any fire will be reported to the PESM.

4.3.6 Fuel

On-site fueling activities will be performed on this project. Only UL approved metal cans shall be used at the project site. All fuel storage containers will be labeled properly. A properly rated fire extinguisher will be located adjacent to the fuel storage facility. Material Safety Data Sheets (MSDSs) for onsite fuels will be made available to all site personnel. When refueling, personnel will place a drip pan or spill pads underneath the fill port to catch any spillage or overflow.

4.3.7 Slips, Trips, and Falls

Slips, trips and falls are a leading cause of injuries in this work setting, therefore, a concerted effort to identify, control, and eliminate these hazards and the measures needed to reduce or eliminate the possibility of injury will be communicated to all site personnel.

4.3.8 Manual Lifting

Manual lifting may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted time, and long treatment and recovery periods. Basic lifting and material handling techniques will be reviewed with all personnel prior to the on-site activities. Controls may include engineering controls, reducing weight of objects that are carried, distance of carrying, or reducing loss potential by rotating workers.

The corporate EHS policy states that individual employees are not to lift loads greater than 50 pounds. **However, this limit may be lowered based on an individual's stature & level of fitness, as determined by the SSHO.**

The following procedure should be used to lift anything, particularly heavier loads, safely:

- Make sure the path of travel is clear;
- Size up the load as to its weight, size and shape;
- Place the feet about a foot apart and close to the object for good balance;
- Bend the knees to a comfortable position and get a good handhold;
- Using both leg and back muscles, lift the load straight up, smoothly and evenly;
- Pushing with the legs, keep the load close to the body;
- Lift the object into carrying position, avoiding twisting movements until the lift is completed;
- Turn the body with changes of foot position. Do not twist at the waist when lifting;
- Using both leg and back muscles, comfortably lower the load by bending at the knees (crouching);
- When the load is securely in place, release the grip; and
- Setting down the load is just as important as picking it up.

The same steps apply to team lifting, with the emphasis on coordination. All should start and finish the lift action at the same time and perform turning movements together.

4.3.9 Traffic Control Activities

The work activities planned for this project may present physical hazards that are inherent to working near motor vehicles. When working in areas with vehicular traffic:

- Wear high visibility traffic vest;
- Consider traffic flow issues and communicate hazards and control to personnel;
- Set up signs, barriers or traffic cones to demarcate work area or to funnel traffic away from work area; and
- Use a spotter to flag vehicles away from work area. All flag persons must be trained on performing the duty.

4.3.10 Hazardous Energy Control

Hazardous energy control may be required during site activities, such as maintenance or repair of tools or equipment. Corporate Procedure EHS 6-4, Lockout/Tagout, establishes the Control of Hazardous Energy Program. The Lockout/Tagout form is included in Appendix C. This program applies to all operations, except as follows:

- Work on cord- and plug-connected electrical equipment where the plug is under the control of the employee performing the work
- Hot tap operations
- Work involving minor changes and adjustments to equipment during routine operations (such as small tooling adjustments)

Refer to details of this program in EHS 6-4. Details of methods used to control hazardous energy for a defined task must be documented in the AHA for that task.

4.3.11 Electrical Safety

The following safe work practices will be implemented when using electrical equipment:

- GFCI devices will be used on all 15 ampere (amp), 20 amp and 120 volt circuits.
- Inspect all extension cords daily for structural integrity, ground continuity, and damage. Inspect extension cord connections. Extension cords must be of the “hard” or “extra hard” service type.
- Elevate or cover electric wire or flexible cord passing through work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- Keep plugs and receptacles out of water unless they are approved submersible-types.
- Ground all electrical circuits in accordance with the National Electrical Code (NEC) or other applicable standards and regulations.
- A minimum 15-foot safe separation distance will be maintained between equipment and 50 kilovolt (kV) overhead electrical lines. This distance will increase 0.4 inches for each 1 kV above 50 kV.

4.3.12 Underground Utilities

Striking underground utilities is a possible hazard whenever intrusive activities are conducted. All steps will be taken to locate underground utilities as per Procedure EHS 3-15 (see APP, Underground Utilities).

This includes white lining the area of intrusive activity and calling the "One-Call" number to have underground utilities located and marked. On private property, a locating service and/or a geophysical survey will be needed.

Underground utility avoidance requires a "competent person" be designated. "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
The Competent Person will be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the State of New York.
- Contacting the appropriate One-Call agency or private locating service, as applicable.
- Recording One-Call locate numbers.
- If necessary, renewing One-Call locate numbers before expiration.
- Ensuring that white-lining of the area of intrusive work is performed.
- Ensuring that a "positive response" has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and have appropriately marked any potential conflicts with the areas of planned intrusive activities.
- Completion of the Underground Utilities Management Checklist.
- Reviewing applicable AHAs with all project members before work begins.
- Conducting training on communication protocols to be used by the intrusive activities observer and equipment operator.
- Ensuring implementation of appropriate work practices during intrusive activities.
- During intrusive activities, conducting daily inspections of the area to make sure that all markings are intact.
- Maintaining required records.
- Providing the SSHO with all required documentation on a daily basis.

4.3.13 Excavation and Trenching

Excavation will be conducted in accordance with the Excavation and Trenching Program, EHS 6-3 of the corporate EHS Program, which is in the APP. Procedures in this document incorporate the requirements of 29 CFR 1926, Subpart P-Excavations. EHS 6-3 requires the designation of a "Competent Person" by the PM and requirements for safe excavating practices. The program also includes requirements for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily competent person inspections; soil classification; sloping and benching; protective systems; and training.

SES-TECH technical personnel will assist the Competent Person in their duties.

Trenches 4 feet or greater in depth will require atmospheric monitoring and ladders for safe entry/egress. Refer to Section 7.0 for air monitoring requirements. The Competent Person will determine the need for cave-in protection. If trenches exceed 5 feet in depth, cave-in protection will be implemented in accordance with the Excavation and Trenching Program, EHS 6-3 of the corporate EHS Program.

The competent person(s) will be responsible for the following:

- Day-to-day oversight of open excavations and trenches.
- Conducting soil classifications.
- Selection of protective systems.
- Conducting daily inspections of open excavations and trenches.
- Providing the SSHO with all required documentation on a daily basis.

Competent persons will have an adequate combination of experience and training to classify soil types and select protective systems as outlined in EHS 6-3. Training and experience pertaining to qualification as a competent person will be documented and include the following:

- General safety practices related to working in or near open excavations.
- Inspection requirements and techniques.
- Classification of soils in accordance with EHS 6-3.
- Uses, limitations, and specifications of protective systems in accordance with EHS 6-3.

Prior to any excavation or underground work, utilities will be identified and located following EHS 3-15 of the corporate EHS Program.

5.0 ACTIVITY HAZARD ANALYSIS

The AHA is a systematic way of identifying the potential health and safety hazards associated with the major phases of work on the project and the methods to avoid, mitigate and control these hazards. The AHAs will be developed for all activities as necessary, prior to start-ups.

AHAs have been developed for the following tasks:

- Mobilization (Including Site Control/Traffic Control);
- Subsurface Geophysical and Geographical Survey ;
- Install Sediment Control/Silt Fence;
- Excavation (trench) and Backfilling;
- Install Water Service Line;
- Hydrostatic Line Testing and Supply Line Disinfection;
- Abandon Groundwater Wells;
- Waste Management (Including Waste Water Sample Collection); and
- Site Restoration and Demobilization (Including Equipment Decontamination).

6.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE specified in Tables 6-1 represents the initial level of PPE selection for each activity required by 29 CFR 1910.132. Specific information on the selection rationale for each activity can be found in the AHAs in Appendix B.

Additional tasks not included in Table 6-1 shall be reviewed by the SSHO and PESM. Any additional PPE requirements will be incorporated into the SSHP by completing the field change request form found

in Appendix A. Modifications for initial PPE selection may also be made by the SSHO in consultation with the PESM using the same form.

6.1 Upgrade Conditions

Level D PPE is anticipated for site work. The SSHO has the responsibility for monitoring site and work conditions and deciding the appropriate level of protection, with PESM approval. In the event air quality monitoring indicates the need for respiratory protection, work operations will be suspended, and the PESM will be contacted. The PPE selection form is included in Appendix D.

6.2 Hazard Assessment for Selection of Personal Protective Equipment

The initial levels of protection were selected by performing a hazard assessment taking into consideration the following:

- Potential site physical hazards present or suspected;
- Work operations to be performed;
- Potential routes of exposure;
- Characteristics, capabilities and limitations of PPE, and any hazards that the PPE presents or magnifies; and
- Hazards that the PPE presents or magnifies.

The task-specific level of PPE required for each task is described in Table 6-1.

Table 6-1 Personal Protective Equipment Selection

TASK	HEAD	EYES/FACE	FEET	HANDS	BODY	HEARING	RESPIRATORY
Mobilization (Including Site Control/Traffic Control)	HH	SG	STB	LWG	WC	EP as needed	Level D PPE
Geophysical and Geographical Survey	HH	SG	STB	LWG	WC	EP or EM	Level D PPE
Install Sediment Control/Silt Fence	HH	SG	STB	LWG	WC	EP as needed	Level D PPE
Excavation (Trench) and Backfilling	HH	SG	STB	Nit	WC	EP as needed	Level D PPE
Install Water Service Line	HH	SG	STB	LWG	WC	EP as needed	Level D PPE
Hydrostatic Line Testing and Supply Line Disinfection	HH	SG Safety Goggles when handling Chlorine	STB	LWG Nitrile gloves when handling Chlorine	WC	EP as needed	Level D PPE
Abandon Water Wells	HH	SG	STB	Nit	WC	EP as needed	Level D PPE
Waste Management (Including Waste Water Sample Collection)	HH	SG	STB	LWG Nitrile gloves when sampling	WC	EP as needed	Level D PPE
Site Restoration and Demobilization (Including Equipment Decontamination)	HH	SG Safety Goggles and Face Shield when handling hot asphalt	STB	LWG Rubber gauntlet gloves when handling hot asphalt	WC Long sleeves when handling hot asphalt	EP as needed	Level D PPE

Abbreviations and Acronyms:

EM = Ear muffs
EP = Ear Plugs
HH = Hard Hat
LWG = Leather Work Gloves
Nit = Nitrile Gloves
OB = Overboot
PFS = Plastic Face Shield
Poly = Polyethylene coated tyvek coveralls
SG = ANSI approved safety glasses with side shields
STB= Steel Toe Boots
WC = Work Clothes

7.0 AIR MONITORING

This section addresses the real-time air monitoring that will be conducted, including instrumentation selection, frequency and location of monitoring.

7.1 Real-Time Air Monitoring

Table 7-1 lists the real-time air monitoring Action Levels to be used in all work areas. All air monitoring results will be recorded, regardless of concentrations. The following instruments will be used for real-time air monitoring:

- Photo-Ionization Detector (PID) with a 10.6 eV lamp.
- Combustible Gas Indicator/Oxygen (CGI/O2) meter.

Organic vapor concentrations (VOCs) will be measured using the PID. Measurements will be recorded per Table 7-2. The monitoring for organic vapors will consist of measurements recorded at the breathing zone (BZ) height in the area of highest employee exposure risk. Based on real time air monitoring readings and site conditions, the SSHO or designee may increase/decrease the frequency at which the readings are taken. The SSHO will interpret all monitoring data based on Table 7-1. The SSHO will review the monitoring and sampling data with the PESM to evaluate the potential for worker exposure.

Table 7-1 Real Time Air Monitoring Action Levels

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone	>10 ppm	Let well ventilate, if concentrations persist, Stop Work and contact PESM. No respiratory protection is required < 10 ppm.	Based on the ACGIH TLVs and OSHA PELs for the potential site contaminants
CGI	Breathing Zone	< 10% LEL	Investigate possible causes, use caution during procedures	Based on increasing potential for ignition of vapors
		> 10% LEL	Cease work activities, proceed to rally point, contact PM and PESM for further instructions	Based on potential for ignition of vapors
O_2 meter	Breathing Zone	< 19.5% O_2	Cease work activities, proceed to rally point, contact PM and PESM for further instructions	Based on low oxygen
		> 22% O_2	Cease work activities, proceed to rally point, contact PM and PESM for further instructions	Based on oxygen enriched atmosphere and explosion hazard

Abbreviations and Acronyms
ACGIH - American Conference of *Governmental* Industrial Hygienists
CGI - Combustible Gas Indicator
LEL - Lower Explosive Limit
O_2 - Oxygen
OSHA – Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
PESM – Project Environmental Safety Manager
PID - Photoionization Detector
PM – Project Manager
ppm - parts per million
TLV - Threshold Limit Value

7.2 Frequency and Location of Real-Time Air Monitoring

Real-time air monitoring will be conducted in accordance with Table 7-2.

Table 7-2 Frequency and Location of Real Time Air Monitoring

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Groundwater Monitoring Well Abandonment (each location)	PID/CGI	When well lids are initially opened
Groundwater Monitoring Well Abandonment (each location)	PID/CGI	During Well Abandonment Task
Excavations if odors are detected	PID/CGI	As needed by observations of odors

Abbreviations and Acronyms
CGI - Combustible Gas Indicator
PID - Photoionization Detector

7.3 Data Quality Assurance

7.3.1 Calibration

Instrument calibration will be documented and included in a dedicated EHS logbook or on separate equipment calibration pages. All instruments will be calibrated before use and will be subject to a continuous calibration check after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.3.2 Operations

All instruments will be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of air monitoring equipment will be maintained on-site by the SSHO for reference.

8.0 ZONES, PROTECTION, AND COMMUNICATION

8.1 Site Control

Portions of this project may be considered to be hazardous waste remediation, and any person working in an area where the potential for exposure to site contaminants exists will be allowed access only after providing the SSHO with evidence of proper training and medical documentation.

8.2 Site Zones

Site zones are intended to control the potential spread of construction related mud or other associated soils/sediments outside the work zone and to assure that only authorized individuals are permitted into areas with potentially hazardous materials, conditions or activities. Excavation and work areas will be cordoned off as needed to prevent access of non-necessary personnel or public from entering the excavation/work zones.

The following shall be used for guidance in developing these preliminary zone designations, if needed.

Support Zone (SZ) – The SZ is an uncontaminated area (trailers, offices, etc.) that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone (CRZ) – The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone, when contaminated materials are present. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone (EZ) – All activities, which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an exclusion zone (EZ). This zone will be clearly delineated by cones, tapes or other means. The SSHO/SS may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site SSHO allowing adequate space for the activity to be completed, field members and emergency equipment.

The Exclusion Zone for this project may be a mobile one based on the location of task. Traffic cones, caution tape and high visibility fencing can help identify the Exclusion Zone Limits. Daily health and safety briefings will assist workers in identifying EZ boundaries.

8.3 Contamination Control

8.3.1 Personnel Decontamination Station

Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure of off-site areas to contaminants from the site.

8.3.2 Minimization of Contact with Contaminants

Personnel should attempt to minimize contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination.

8.3.3 Personnel Decontamination Sequence for Well Abandonment Activities

During the well abandonment activity, personnel and equipment leaving the exclusion zone shall be thoroughly decontaminated. Personnel will thoroughly decontaminate upon exiting the EZ or CRZ prior to eating, drinking, smoking, applying cosmetics, or any other actions that would increase the risk of hand to mouth transfer of contaminants. The following protocol shall be used for the decontamination station for the well abandonment activities:

Two small tubs (two sets of wash and rinse water), scrub brush, towels, contaminated clothing disposal bag or drum, and, respiratory protective equipment cleaning solution.

Non-phosphate detergent (i.e., Dove) and water should be sufficient for use as the decontamination solution. All receptacles for contaminated protective clothing will be equipped with lids that can be closed to prevent the release of contaminants and the collection of rainfall. The decontamination liquids and clothing will be contained and disposed according to Federal, State and local regulations as detailed in the Work Plan.

8.3.4 Heavy Equipment Decontamination

Decontamination of drill tools and removed well pumps will be conducted on a temporary decontamination pad and will consist of potable water rise. All liquids used in the decontamination procedure will be collected, stored and disposed in accordance with Federal, State and local regulations as detailed in the Work Plan.

Dry decontamination (gross decon and dry brushing) will be conducted on site equipment to avoid tracking soil onto or off the Site.

8.4 Communication

Two methods may be utilized for site communication and control.

- A telephone will be available in the SSHO Site Vehicle
- Cellular phones will be utilized when in Exclusion Zone (Heavy Equipment Operator only)

8.5 Local Emergency Support Units

Local Emergency Support units are available by dialing 911. Cell Phones are utilized as appropriate for communication with Emergency Support Units.

9.0 MEDICAL SURVEILLANCE PROCEDURES

The Corporate Medical Consultant is with WorkCare, located in Anaheim, California. Dr. Peter Greaney, the Director, is Board certified in occupational medicine and may be reached at (800) 455-6155.

9.1 Medical Surveillance Requirements

All personnel performing field work where potential exposure to contaminants exists are required to have completed and passed a medical surveillance examination in accordance with 29 CFR 1910.120(f). Prior to work on-site, a physician's medical release for work will be confirmed by the SSHO.

9.2 Medical Data Sheet

A medical data sheet is provided in Appendix E. This medical data sheet is voluntary and should be completed by all on-site personnel and will be maintained at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance.

10.0 SAFETY CONSIDERATIONS

10.1 General Health and Safety Work Rules

A list of work rules and general safe work practices has been included from the corporate procedure EHS 3-6. These rules have been incorporated into the SSHP and are included in Appendix F. The work rules will be reviewed during Initial Orientation/Site Specific Health and Safety training.

11.0 WASTE DISPOSAL PROCEDURES

It is anticipated that only solid/municipal waste (i.e., PPE, minor construction debris and waste, abandoned well materials) and displaced water from the well abandonment will be generated during the water service line installation. No hazardous wastes are anticipated. Solid wastes will be managed in accordance with NYDEC regulations for solid waste.

All disposal facilities and transporters used for off-site disposal will be approved in accordance with corporate Regulatory Compliance Procedure and will be approved by NAVFAC prior to use. SES-TECH will prepare all waste documentation (profiles, Bills of Lading, manifests) for NAVFAC review and signature. SES-TECH personnel will not sign any waste documentation unless written authorization is provided by the NAVFAC and approval is obtained from the legal department.

11.1.1 Groundwater Monitoring Well Abandonment

Four existing 75-foot deep (estimated) water wells, currently used to supply water to the PRSC, will be abandoned upon successful completion of water service connections.

Displaced water generated during well abandonment will be contained around the well head and then containerized in 55-gallon steel drums for waste characterization, profiling, and transportation to a Navy pre-approved disposal facility. It is anticipated that the well water may contain chlorinated solvents associated with the groundwater contaminant plume. Displaced water will be contained around the well head and then containerized in 55-gallon steel drums for waste classification and off-site disposal.

Drilling equipment and removed well pumps will be decontaminated with a potable water rinse. Decontamination fluid will be collected and containerized with the displaced water generated during the well abandonment.

11.1.2 General Construction Debris and Trash

Construction debris and trash are expected to be non-hazardous will be placed into appropriate containers for disposal as non-hazardous waste at an approved off-site facility.

11.1.3 Recyclable Materials

The following uncontaminated recyclable materials may be generated during project activities and will be recycled if suitable recycling facilities are available:

- Metal,
- Paper and cardboard,
- Glass, metal, and plastic beverage containers, and
- Mechanical and electrical products and equipment.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies can happen unexpectedly and require an immediate response. Therefore, contingency planning and advanced training are essential.

12.1 Responsibilities

12.1.1 Project Environmental Safety Manger (PESM)

The PESM is Roger Margotto, CIH, CSP. The PESM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PESM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 SSHO/Emergency Coordinator

The SSHO/Emergency Coordinator is Stavros Patselas. The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action. The SSHO/Emergency Coordinator is responsible for evacuating the Site safely. The SSHO/Emergency Coordinator is required to immediately notify the PESM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PESM can notify OSHA within the required time frame. The PESM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours.

The SSHO/ Emergency Coordinator shall verify emergency phone numbers and confirm hospital routes annually.

12.1.3 Emergency Reporting

The corporate procedure EHS 1-7, Incident Reporting and Investigation details the procedures and the forms used by SES-TECH for event investigation including site emergencies. When an incident occurs, the SSHO will immediately notify the PM and PESM and the PM will notify the contract Program Manager. If the incident is an OSHA recordable injury or exceeds $200,000 in property damages, the PM will immediately notify the RPM & the ROICC. The current NAVFAC RPM is Lora Fly and the NAVFAC Resident Officer in Charge of Construction (ROICC) is Mr. Greg Pearman.

After the event report of incident is completed, the SSHO must submit a draft written SES-TECH event report within 24 hours. Within 10 days of occurrence, a completed investigation report must be submitted to the PESM. All reports are reviewed by the PM and the PESM. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. The system requires follow-up to ensure completion of corrective actions.

Report of applicable accidents or incidents shall be made to the RPM/ROICC as soon as possible, but not more than 24 hours after occurrence. The PM or the SSHO will complete an Incident Report as required for any OSHA Recordable injury. Investigation and Corrective Actions shall be submitted to Contracting Officer/Contracting Officer's Representative (CO/COR) no later than five (5) working days following the Incident. Corrective Actions shall be implemented as soon as reasonably possible.

The PM or the SSHO will immediately notify the RPM/ROICC in the event of:

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

12.2 Communication

Two methods may be utilized during emergency situations. These are discussed in the following sections.

12.2.1 Telephone Communication

- A telephone will be maintained in the SSHO Site Vehicle.
- Cellular phones will be utilized when away from Work Zones.

12.3 Local Emergency Support Units

In order to assist with any emergency that might occur at the site, a copy of Table 12-1 will be posted prominently in the site office or available in the SSHP kept on the Site.

Table 12-1 Emergency Contact Telephone Numbers

Contact	Firm or Agency	Telephone Number
Police	Suffolk County Police Long Island, NY	911 or (631) 852-2000
Fire	Riverhead Fire Dept Riverhead, Long Island/NY	911 or (631) 727-2751
Ambulance	Riverhead Volunteer Ambulance Corps (RTVAC) Riverhead, NY	911 or (631) 727-1686
Hospital-**EMERGENCY**	Central Suffolk Hospital Peconic Bay Medical Center 1300 Roanoke Avenue Riverhead, New York 11901	Emergency Rm. (631) 548-6200 Main (631) 548-6000
Occupational Work Care Clinic **NON-EMERGENCY**	Island Urgent Medical Care 1228 East Main Street Riverhead, NY 11901	631-603-3400
Poison Control Center	National Contact	(800) 222-1222
National Response Center	National Contact	(800) 424-8802
Dr. Peter Greaney	Work Care (Occupational doctor)	(800) 455-6155
Al Taormina Facility Contact	ECOR Solutions, Inc. NWIRP, Bethpage	(516) 346-0344 or (516) 702-5861 Cell
Lora Fly NAVFAC RPM	NAVFAC MIDLANT	(757) 341-2012
Greg Pearman NAVY RIOCC	NAVFAC	(860) 235-2040
Stavros Patselas Project Manager/ Superintendent/SSHO	SES-TECH – Langhorne, PA Office	Office: (215) 702-4099 Cell: (267) 688-9967
To be determined Alternate SSHO	SES-TECH	Office Cell
Roger Margotto, CIH, CSP PESM	SES-TECH – San Diego, CA Office	Office: (619) 471-3503 Cell: (619) 988-0520

Abbreviations and Acronyms:

CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
EMS – Emergency Medical Services
MIDLANT – Mid Atlantic
NAVFAC – Naval Facilities Engineering Command
NWIRP - Naval Weapons Industrial Reserve Plant
PESM – Project Environmental Safety Manager
ROICC - Resident Officer in Charge of Construction
RPM – Remedial Project Manager
SES-TECH – Sealaska Environmental Services, LLC, and Tetra Tech EC, Inc.
SSHO – Site Safety and Health Officer

Appendix G includes a route map from site to the nearest hospital. This and other maps will be posted adjacent to the above emergency telephone numbers in the site office or available in the SSHP on the Site. It should also be placed in all on-site vehicles that are located at the PRSC Site.

The Hospital for EMERGENCY CARE is:

Primary EMERGENCY /URGENT Care Facility:

Central Suffolk Hospital
Peconic River Medical Center
Riverhead, New York
ER (631) 548-6200
Main (631) 548-6000

12.4 Emergency Medical Treatment

The procedures and rules in this SSHP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it must be immediately reported to the SSHO.

The injury notification procedures in ZIP® Bulletin 108 in Appendix H will be followed.

During the course site specific safety training/orientation, project personnel will be informed of the location of the first aid station(s). Unless they are in immediate danger, injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment.

Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance.

12.4.1 Emergency Medical Treatment

First-aid equipment will be available on site at the following locations:

- First Aid Kit : Site Vehicle;
- Sorbet Pads: Site Vehicle;
- First Aid Kit with Inventory Sheet: Site Vehicle; and
- Emergency Eye Wash: Site Vehicle.

Two qualified individual in first aid and CPR will be assigned to the PRSC Site.

12.4.2 Emergency Response

Some physical signs/symptoms that require emergency medical treatment and may require a call to 911 include: chest pain, difficulty breathing, uncontrolled bleeding, bone fracture, loss of consciousness, severe head injury, poisoning, shock, loss of limb, and sudden and prolonged dizziness.

In an emergency situation:

- Call 911 for initial employee evaluation and possible transportation to hospital via EMS.

- A designated SES-TECH employee shall accompany the injured worker to the hospital.
- If trained, administer first aid to minimize the injury effects.
- Call WorkCare at (800) 455-6155 for a triage call/discussion with an Occupational Health Nurse or physician.
- Mention to WorkCare representative ASAP that the call is regarding an emergency injury.
- Provide the following information to WorkCare:
  - Name of person calling
  - Contact Phone Number
  - Location calling from
  - Name of individual injured
- Date and type of injury.
- During WorkCare off-hours, dial the 800 number.
- A WorkCare health care representative will call you back shortly.
- Do not delay treatment while awaiting a return phone call.
- Call the PESM and PM immediately.

12.4.3 Non-Emergency Response

In a non-emergency situation:

- If trained, administer first aid to minimize the injury effects
- Call WorkCare at (800) 455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Mention ASAP that the call is regarding an injury. The Occupational Health Nurse will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
  - During WorkCare off-hours, dial the 800 number and identify yourself.
  - A WorkCare health care representative will call you back shortly.
  - Do not delay treatment while awaiting a return phone call.
  - Call the PESM and PM.
  - Call the local WorkCare clinic to notify them that you are bringing an injured worker to their clinic for evaluation.
  - You may transport the injured employee to the local clinic in a privately owned vehicle. A designated SES-TECH employee must accompany the injured worker to the local clinic.

The WorkCare Clinic for Non-Emergency injuries at the PRSC site is:

<u>Non-Emergency/Occupational Care Facility</u>:

Island Urgent Medical Care
1228 East Main Street
Riverhead, NY 11901
Phone number: 631-603-3400

Directions to the Non-Emergency clinic are included in Appendix G.

12.4.4 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The Emergency Coordinator (EC) will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency.

The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period. All project personnel will be instructed on proper emergency response procedures and location of emergency telephone numbers during the initial site specific safety training.

If traffic control is necessary, as in the event of a fire or explosion, a project team member, who has been trained in these procedures and designated by SSHO, will take over these duties until local police and fire fighters arrive.

The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. A map showing evacuation routes, meeting places and location of emergency equipment will be included in site specific training/orientation.

12.4.5 Evacuation Route/ Rally Point/ Head Count Procedure

The Rally Point for Site Emergency Evacuation is:

- To be determined by SSHO upon Mobilization

In the event of an Emergency Evacuation a Head Count will be performed of individuals on-site (if any).

12.4.6 Evacuation Drills

Due to the nature of the work and short duration of the Project, emergency evacuation drills may or not be performed. A determination will be made by SSHO, in consultation with PESM, whether or not to test the emergency evacuation system.

12.4.7 Fire Prevention and Protection

In the unlikely event of a fire or explosion, Emergency Response procedures will include:

- Immediately evacuating the site;
- Assembly at the designated rally point; and
- Notification of local fire and police departments.

No personnel will fight a fire beyond the stage unless trained in the proper use of fire extinguishers and if the fire can be put out with a portable extinguisher in 30 seconds or less (incipient stage).

Adhering to the following precautions will prevent fires:

- Good housekeeping and proper storage of flammable materials;

- Smoking is not permitted; and
- Performing monthly inspections of fire extinguishers.

The person responsible for the maintenance of fire prevention and/or fire suppression equipment is the site SSHO.

12.5 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

1. Roger Margotto; PESM - (619) 471-3503
2. Stavros Patselas; Project Manager - (215) 702-4066
3. The employer of any injured worker - (if not a SES-TECH employee)

Electronic/written confirmations of verbal reports are to be submitted within 24 hours of event.

12.6 Adverse Weather Conditions

In the event of adverse weather conditions, the SSHO will determine if work can continue safely. Some of the issues to consider when determining if work can continue safely are:

- Hail, rain, snow, ice, high winds;
- Limited visibility (fog); or
- Potential for electrical storms.

12.7 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS should be consulted to assist in determining the best means of containment and cleanup. For small spills, absorbent materials such as sand, sawdust or commercial absorbents should be placed directly on the substance to contain the spill and aid recovery. An area of 50-100 feet around the spill area should be established depending on the size of the spill.

- In event of a spill, the SSHO/EC will determine the nature of the spill, ensure safety of any individual in area, and notify appropriate EMS/Emergency Response authorities i
- If a flammable liquid, gas or vapor is involved, the SSHO shall remove all ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc).
- Regulatory compliance support: contact SES-TECH Boston office: Lee Dixon (617) 257-3337.

12.8 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit;
- Portable eye washes meeting the latest requirements of ANSI Z358.1;
- Fire extinguishers (one per trailer/vehicle);

- Cell phones; and
- Absorbent material.

12.9 Postings

The following information shall be developed and posted in the site office or kept on the Site in the SSHP:

- Emergency telephone numbers;
- Diagrams showing the location of fire extinguishers and emergency equipment;
- Emergency exit, evacuation routes and staging area; and
- Route to the hospital.

12.10 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers;
- Refilling medical supplies;
- Recharging eyewash; and
- Replenishing spill control supplies.

13.0 TRAINING

13.1 Site Specific Health and Safety Training/Orientation

Site specific training/orientation will address the activities, safe work procedures, air monitoring, PPE, emergency response procedures required for the tasks performed at the PRSC site.

13.2 On-Site Safety Briefings

Project personnel will be given health and safety briefings by the SSHO. The briefings will include providing specific direction to the work party, if applicable, any new activity will require the development of an AHA to address hazards and controls. The daily briefing will be used as a forum to train workers involved in the activity. A copy of the on-site safety briefing sheet is included in Appendix I.

13.3 First Aid and CPR

The closest civilian medical emergency/urgent care facility is Central Suffolk Hospital and has been identified as the primary medical facility for the site. Route maps to Central Suffolk Hospital and the Non-Emergency clinic are included in Appendix G. The SSHP provides additional information regarding on-site medical support program. Off-site medical support (non-emergency care) is provided by both Central Suffolk Hospital and the Occupational Work Care Clinic.

13.4 Hazard Communication

Hazard communication training will be provided and documented. This training will be included, at a minimum, during the initial site safety training/orientation.

13.5 SiteSafety and Health Officer Training

The SSHO shall maintain competency through 24 hours of formal safety and health related coursework every four (4) years.

13.6 Annual Eight-Hour OSHA Refresher Training

Annual 8-hour OSHA HAZWOPER refresher training will be required of all hazardous waste site field personnel in order to maintain their OSHA HAZWOPER qualifications for field work. The training will cover a review of 1910.120 requirements and related SES-TECH company programs and procedures.

13.7 Supervisory Training

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40-hour OSHA HAZWOPER training.

14.0 LOGS, REPORTS AND RECORD KEEPING

The following is a summary of required health and safety logs, reports and record keeping.

14.1 Field Change Request

The FCR form is to be completed for initiating a change to the SSHP and is found in Appendix A. The PESM and PM or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. Copies will be distributed to the client representative.

14.2 Medical and Training Records

Verification of required training (40-Hour, 8-Hour, supervisor, site specific training and medical clearance for hazardous waste work) will be maintained on site. All employee medical records will be maintained by the Corporate Medical Consultant – WorkCare.

14.3 Exposure Records

All real time air monitoring results will be maintained by the SSHO. At the end of the project, exposure records will be maintained according to 29 CFR 1910.1020 requirements.

14.4 Accident/Incident Reports

Incident reporting and investigation will follow corporate procedure EHS 1-7.

14.5 OSHA Form 300

An OSHA 300 Form is maintained by SES-TECH. All OSHA recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the PESM for maintenance.

14.6 Health and Safety Logbooks

The SSHO will maintain logbooks during site work. The daily site conditions, air monitoring results and significant events will be recorded. The original logbooks will become part of the employee exposure records file.

14.7 Hazard Communication Program/MSDS

The hazard communication program will be maintained on site and training on the program information and requirements will be provided in accordance with 29 CFR 1910.120 and 1926.59, Hazard Communication, 1910.120, Retention of DOT Markings, placards and labels.

MSDS will be obtained for substances brought on site. A Toxic Substance Inventory will be kept on file in the Site office or with the SSHP. All chemical containers shall be properly labeled in accordance with the requirements of the applicable standards.

14.8 EH&S Inspections

The SSHO will perform weekly EHS inspections to assess site conditions and verify compliance with SSHP. The PM or designee will perform site inspections. The weekly and monthly inspection report forms are included in Appendix J.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the SSHP. It is maintained on site by the SSHO as a project record. Each person shall sign this section after site-specific training/orientation is completed.

STATEMENT OF SITE SAFETY AND HEALTH PLAN TRAINING

I have read, or have been informed of, the Site Health and Safety Plan for the NWIRP Calverton PRSC Site in Calverton, NY and understand the information presented.

I will comply with the provisions contained therein.

Name (Print and Sign)	Company	Date

16.0 REFERENCES

American Conference of Governmental Industrial Hygienists, Inc., 2011, "Threshold limit values for chemical substances and physical agents in the work environment and biological exposure indices;" ACGIH, Cincinnati, Ohio.

U.S. Department of Labor, Occupational Safety & Health Administration, 29 CFR 1910 - General Industry

Tetra Tech EC, Inc. Corporate Health and Safety Program, Corporate Reference Libraray.

U.S. Army Corps of Engineers, 2008, Safety and Health Requirements Manual; EM 385-1-1.

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FIGURES

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Quadrangle Location Map

0 2000 4000 Feet

N

Source: U.S.G.S. Topographic Maps (7.5 Minute)
Wading River, NY Quadrangle

NAVFAC MID–ATLANTIC
Hampton Roads RAO LTM EMAC

NWIRP Calverton, NY
Southern Area
Site 6-A PRSC

Figure 1
Site Location Map

SES - TECH Atlantic

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N

RIVER ROAD

OREGON ROAD (NOT OPEN)

VIRGINIA AVE (NOT OPEN)

KANSAS AVE (NOT OPEN)

CONNECTICUT AVE

PECONIC RIVER

TOWN OF RIVERHEAD

TOWN OF BROOKHAVEN

0’ 200’ 400’ 600’

SES - TECH Atlantic

DSGN: BK
DR: BM
CH ENG:
SUBMITTED BY:
(FIRM MEMBER)
(TITLE)
(DATE)
OFFICER IN CHARGE
DATE
APPROVED
DATE
DESCRIPTION
REV

NAVAL FACILITIES ENGINEERING COMMAND

DEPARTMENT OF THE NAVY

NAVFAC Mid-Atlantic

389 RIVER RD CALVERTON NY

SUFFOLK COUNTY, NEW YORK

INSTALLATION OF WATER SERVICE
TO PECONIC RIVER SPORTSMAN’S CLUB

SITE LAYOUT

SEAL AREA

SAT TO DATE

CODE I.D. NO.

SCALE : AS SHOWN

SPEC. NO.

CONSTRN. CONTR. NO.
N40085-11-D-0043

NAVFAC DRAWING NO.

SHEET OF

SIZE: D

DIS. SH. NO. Figure 2

4400-FIGURE-2.DWG

P:\Hampton Roads EMAC\CADD-GIS\Calverton\Calverton 6A PRSO\Drawings\4400-Figure-2.dwg

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APPENDIX A

FIELD CHANGE REQUEST FORM

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FIELD CHANGE REQUEST

Project:	Contract No.:	Field Change No.:

To:	Dept.:	Location:	Date:
Re: ☐ Drawing No.:	Rev No.:	Title:	
☐ Spec No.:	Rev No.:	Title:	
☐ Other:			

1. Description (Items involved; submit sketch if applicable:
2. Reason for change (If from disposition of nonconformance report, list report number):
3. Recommended Disposition: ☐ Minor Change ☐ Major Change Describe details:

4. Resident Engineer (Signature):	Date:	Project Supt. Concurrence (Signature):	Date:
5. Disposition:			
☐ Not Approved—Give reason: ☐ Considered Minor Change—Approval per recommended disposition; design documents will normally not be revised; field to maintain as-built records ☐ Considered Major Change—Action will be taken as prescribed on DCN			
Lead Disc. Engr/Designee (Signature)	Date:	Project Engr/Designee (Signature)	Date:

Project Engineer signs and returns to Lead Discipline Engineer for transmittal to Resident Engineer with copies to:

☐ Project Manager (Name):
☐ Site Superintendant (Name):
☐ Project Files (Location):
☐ Others (Name):

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APPENDIX B

ACTIVITY HAZARD ANALYSES

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Activity Hazard Analysis (AHA) #1

Job/Task: Mobilization, Including Site Control/Traffic Control	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**		
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

Risk Assessment Code (RAC) Matrix

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

Notes: (Field Notes, Review Comments, etc.)
In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

AHA #1 - Mobilization, including Site Control/Traffic Control

Job Steps	Hazards	Controls	RAC
1. Dig Alert notification	Gas utility explosion, electrocution, wet utility rupture, fiber optic/ data/ phone line damage.	Ensure that all utilities (identified by Dig Safe/Alert prior to the start of field work) are marked. Identify all markings painted by the geophysical surveyor as well. Perform excavation within 4 feet of existing utilities by hand and/or non-aggressive methods per EHS 3-15, Underground Utilities. Review base drawings and Base-Engineering Department as-built Drawings. Visibly inspect areas for other potential existing utilities.	L

AHA #1 - Mobilization, including Site Control/Traffic Control			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Set up work areas	Eye injury	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.	L
	Noise from the heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working in unenclosed cabs of heavy equipment, or ground workers working near heavy equipment.	L
	Injury from Equipment Mobilization & set-up.	Use a spotter to back up Heavy Equipment Discuss hand signals, especially the signal for "stop".	M
	Slip, trip, and fall hazards could be present.	Visually inspect work areas; eliminate slip, trip, and fall hazards if feasible, otherwise barricade/ isolate the hazards. Keep work areas neat and orderly. Always place supplies, hoses, cords and other equipment in areas away from normal foot traffic, and equipment and tools in a safe location that does not present a trip hazard to work areas. Work is authorized during daylight hours only.	L
	Sharp objects could cause puncture.	Wear cut-resistant work gloves when handling sharp edges and items with pinch points, such as barricades, EZ-up shade structures, folding chairs, etc. Whenever possible, blunt sharp edges and double over wire ends (fencing, material bundles, etc.). Workers should not stand or walk on either equipment or supplies.	L
	Musculo-skeletal strains from lifting and moving materials/ equipment manually.	Use mechanical lifting equipment and hand-trucks whenever possible. Otherwise, use proper lifting techniques, get help when moving bulky/heavy materials and equipment. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M
	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke).	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	L
	Worker exposure to extreme temperatures (Cold Stress)	Monitor for cold stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes.	L

AHA #1 - Mobilization, including Site Control/Traffic Control

Job Steps	Hazards	Controls	RAC
2. Set up work areas (con't)	Lack of communication in widely dispersed areas could lead to a delayed response in an emergency.	Ensure that each work team has a phone, or access to a phone, for emergency communication. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	L
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites.	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers Understand and review posted hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	M
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	If deemed necessary, wear leather gloves and/ or nitrile gloves when working. Use insect repellant as necessary. Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider, scorpion bites/ stings.	L
3. Installation of site zone fencing, signage, eyewash station structure, etc.	Injury from improper use of power and hand tools.	Inspect all tools for damage before each use, including electrical cords/ pneumatic hoses. Ensure double insulation on electrical tools. Train personnel in the proper use of hand tools. GFCI required for all connections to outdoor use of power tool and other electrical equipment insulation.	L
	Electrocution during the operation of a generator lacking GFCI outlets, or use of a GFCI generator in conjunction with: Ungrounded (2 wire) extension cord or worn insulators around hot wire of cord. Non-double-insulated power tools. The generator itself lacks a GFCI outlet.	Only qualified electricians are allowed to hook up or disconnect electrical circuits. Follow lock-out/tag-out protocols. Inspect all extension cords daily for structural integrity, ground continuity, and frayed ends/ worn insulation. The extension cord must be rated for hard usage or extra hard usage (Table 400-4, NEC). Inspect the extension cord connection. Use GFCIs on all outdoor 115- to 120-volt, 20-ampere, or less, circuits. Elevate, or cover, any electric wire or flexible cord passing through the work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching, such as doorways, windows (cover only in accordance with NEC requirements). Keep plugs and receptacles out of water unless they are of the approved, submersible type. Ground all electrical circuits in accordance with the NEC, or other applicable standards and regulations. If a generator is used, make sure that it is a type that does not require grounding to the earth by rod. If it requires grounding, follow manufacturer's directions. NEC 250-6 lists the exceptions for grounding portable and vehicle-mounted generators.	M

AHA #1 - Mobilization, including Site Control/Traffic Control

Job Steps	Hazards	Controls	RAC
3. Installation of orange/site zone fencing, stockpile cover, signage, eyewash station structure, etc. (con't)	Worker strain from manually moving materials and equipment.	Direct personnel to use proper lifting techniques during the first tailgate meeting. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Site Vehicles	Drivers must have current State-issued driver's license. Trained and authorized personnel will operate off road vehicles. Qualified operators will be identified upon assignment.	Receipt inspection by Equipment Supervisor. Daily vehicle inspection by drivers. Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Heavy Equipment	Inspect daily, and before use. Use the form provided in the SSHP. Qualified operators will be identified upon assignment.	Only trained equipment operators may operate heavy equipment; Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Flagging materials and signage	Provide flagger training.	Ensure that materials comply with Traffic Control Plan specifications. Inspect signage regularly.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire Extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. (29 CFR 1926.50(d)(2)) First aid kits must be filled per EM 385-1-1.

AHA #1 - Mobilization, including Site Control/Traffic Control

Acronyms:

AHA – Activity Hazard Analysis
APP-Accident Prevention Plan
dBA – decibels, A-scale
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
CFR – Code of Federal regulations
EM – Engineer Manual
EHS – Environmental Health and Safety
GFCI – ground fault circuit interrupter
MSDS – Material Safety Data Sheet
NEC – National Electrical Code
PESM- Project Environmental Safety Manager
PPE – personal protective equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #2

Job/Task: Geophysical and Geographical Survey	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**		
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2011**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

Risk Assessment Code (RAC) Matrix

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

Notes: (Field Notes, Review Comments, etc.)
In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

AHA #2 - Geophysical and Geographical Survey

Job Steps	Hazards	Controls	RAC
1. Dig Alert notification	Gas utility explosion, electrocution, wet utility rupture, fiber optic/ data/ phone line damage.	Ensure that all utilities (identified by Dig Safe/Alert prior to the start of field work) are marked Identify all markings painted by the geophysical surveyor as well. Perform excavation within 4 feet of existing utilities by hand and/or non-aggressive methods per EHS 3-15, Underground Utilities. Review base drawings and Base-Engineering Department as-built Drawings. Visibly inspect areas for other potential existing utilities.	L

AHA #2 - Geophysical and Geographical Survey			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Conduct a geophysical and site survey	Slips, trips, and falls.	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards, if feasible. Use care in the work area; look for depressions and obstructions. Allow employees to work only on walking/working surfaces that have the strength and integrity to support employees safely. Look for burrows/ squirrel holes. Cover and mark openings 18 inches or more in diameter.	M
	Workers Struck by vehicles traffic.	Wear high-visibility reflective vests. Post an observer, as needed, when a surveyor is using instruments (a surveyor is often focused on the task and may not be aware of nearby traffic). Use traffic control or barricades, if necessary, to keep traffic away from workers.	L
	Exposure to spray paint and propellant while marking underground utilities and anomalies.	Follow manufacturers' instructions on the use of paint. Review the appropriate MSDS. Never point paint nozzles toward another person.	L
	Worker strain from manually moving materials and equipment.	Direct personnel to use proper lifting techniques Encourage the use of mechanical lifting equipment Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites.	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers Understand and review posted hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	M
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	If deemed necessary, wear leather gloves and/ or nitrile gloves when working Use insect repellant as necessary. Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider, scorpion bites/ stings.	L

AHA #2 - Geophysical and Geographical Survey			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Conduct a geophysical and site survey (con't)	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke).	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	L
	Worker exposure to extreme temperatures (Cold Stress).	Monitor for cold stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes.	L
	Eye injury.	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.	L

Equipment to be Used	**Training Requirements/Competent or Qualified Personnel name(s)**	**Inspection Requirements**
Site Vehicles	Drivers must have current State-issued driver's license. Trained and authorized personnel will operate off road vehicles. Qualified operators will be identified upon assignment.	Receipt inspection by Equipment Supervisor. Daily vehicle inspection by drivers. Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Hand and power tools, geophysical instruments, survey instruments	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire Extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. (29 CFR 1926.50(d)(2)) First aid kits must be filled per EM 385-1-1.

Acronyms:

AHA – Activity Hazard Analysis
EM – Engineer Manual
EHS – Environmental Health and Safety
MSDS – Material Safety Data Sheet
PESM- Project Environmental Safety Manager
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan

Activity Hazard Analysis (AHA) #3

Job/Task: Install Sediment Control/Silt Fence	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**	**Severity**	**Probability**
Date Prepared: **March 2012**		Frequent / Likely / Occasional / Seldom / Unlikely
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**	Catastrophic	**E / E / H / H / M**
	Critical	**E / H / H / M / L**
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**	Marginal	**H / M / M / L / L**
	Negligible	**M / L / L / L / L**

Notes: (Field Notes, Review Comments, etc.)
In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

AHA #3 - Install Sediment Control/Silt Fence

Job Steps	Hazards	Controls	RAC
1. Installation of silt fence and stockpile cover/area.	Eye injury	Safety glasses (clear or tinted) are the minimum required eye protection for all work areas.	L
	Noise from the heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working in unenclosed cabs of heavy equipment, or ground workers working near heavy equipment.	L

AHA #3 - Install Sediment Control/Silt Fence			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Installation of silt fence and stockpile cover/area. (con't)	Injury from Equipment Mobilization & set-up.	Use a spotter to back up Heavy Equipment Discuss hand signals, especially the signal for "stop".	M
	Slip, trip, and fall hazards could be present.	Visually inspect work areas; eliminate slip, trip, and fall hazards if feasible, otherwise barricade/ isolate the hazards. Keep work areas neat and orderly. Always place supplies, hoses, cords and other equipment in areas away from normal foot traffic, and equipment and tools in a safe location that does not present a trip hazard to work areas. Work is authorized during daylight hours only.	L
	Sharp objects could cause puncture.	Wear cut-resistant work gloves when handling sharp edges and items with pinch points, such as barricades, EZ-up shade structures, folding chairs, etc. Whenever possible, blunt sharp edges and double over wire ends (fencing, material bundles, etc.). Workers should not stand or walk on either equipment or supplies.	L
	Musculo-skeletal strains from lifting and moving materials/ equipment manually.	Use mechanical lifting equipment and hand-trucks whenever possible. Otherwise, use proper lifting techniques, get help when moving bulky/heavy materials and equipment. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M
	Worker exposure to extreme temperatures (Heat exhaustion/ heat stroke).	Monitor for heat stress and implement heat stress prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing impermeable protective clothing.	L
	Worker exposure to extreme temperatures (Cold Stress)	Monitor for cold stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes.	L

AHA #3 - Install Sediment Control/Silt Fence			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Installation of silt fence and stockpile cover/area. (con't)	Lack of communication in widely dispersed areas could lead to a delayed response in an emergency.	Ensure that each work team has a phone, or access to a phone, for emergency communication. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	L
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent work sites.	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers Understand and review posted hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	M
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	If deemed necessary, wear leather gloves and/ or nitrile gloves when working Use insect repellant as necessary. Before donning, drop work gloves on the ground and step across their entire surface to reduce the likelihood of bee, spider, scorpion bites/ stings.	L
	Injury from improper use of power and hand tools.	Inspect all tools for damage before each use, including electrical cords/ pneumatic hoses. Ensure double insulation on electrical tools. Train personnel in the proper use of hand tools. GFCI required for all connections to outdoor use of power tool and other electrical equipment insulation.	L
	Worker strain from manually moving materials and equipment.	Direct personnel to use proper lifting techniques during the first tailgate meeting. Encourage the use of lifting equipment and use of a hand-truck whenever possible. Employees will not lift more than 50 pounds alone. Encourage a steady, sustainable work pace.	M

AHA #3 - Install Sediment Control/Silt Fence		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel name(s)**	**Inspection Requirements**
Site Vehicles	Drivers must have current State-issued driver's license. Trained and authorized personnel will operate off road vehicles. Qualified operators will be identified upon assignment.	Receipt inspection by Equipment Supervisor. Daily vehicle inspection by drivers. Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire Extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. (29 CFR 1926.50(d)(2)) First aid kits must be filled per EM 385-1-1

Acronyms:

AHA – Activity Hazard Analysis
APP-Accident Prevention Plan
dBA – decibels, A-scale
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
CFR – Code of Federal regulations
EM – Engineer Manual
EHS – Environmental Health and Safety
GFCI – ground fault circuit interrupter
NEC – National Electrical Code
PESM- Project Environmental Safety Manager
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

ACTIVITY HAZARD ANALYSIS (AHA) #4

Job/Task: Excavation and Backfilling	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

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

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

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

AHA #4 – Excavation and Backfilling

Job Steps	Hazards	Controls	RAC
1. Excavate	Contact with underground utilities could cause injury to worker and damage to property or equipment.	Physically verify the location and depth of existing utilities prior to starting excavation through geophysical and utility survey. Call National One Call, 811, prior to any disturbance of ground. Scan the excavation area with electromagnetic and sonic equipment and mark ground where existing underground utilities are discovered. Protect all existing utilities during excavation. Perform excavation within 4 feet of existing utilities by hand and/or nonaggressive methods per EHS 3-15, Underground Utilities. Protect all underground utilities as soil is removed around or under the utility line.	M

AHA #4 – Excavation and Backfilling			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Excavate (con't)	Workers could be struck by or against heavy equipment.	Wear high-visibility safety vests when exposed to vehicular traffic. Avoid equipment swing areas. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Workers must always be in visual sight of the operators. Use trained spotters.	M
	Workers could be exposed to potential gases, such as natural gas from a leaking gas line.	If odors are detected, immediately check for the presence of potentially explosive gas concentrations.	M
	Excavation hazards, such as collapsed sides, equipment tipping over, flooding, or falling, could be present.	Follow EHS 6-3, Excavation and Trenching. Ensure proper shoring or sloping. Spoil banks and equipment must be at least 3 feet away from the excavation (EHS 6-3). Use diversion ditches, dikes, or other means to prevent surface water from entering an excavation and to provide good drainage of the area adjacent to the excavation. Daily inspections of excavation, the adjacent areas, and protective systems shall be made by the project assigned competent person (to be determined). The excavation/ trenching permit must also be completed by the competent person each day. Maintain eye contact with operators. Personnel must wear high-visibility safety vests. Avoid climbing on berms and any temporary stockpiles. Barricade all open excavations as required by the Work Plan. (The plan calls for opening only short sections at a time so excavations can be closed at the end of the day). Handle soil carefully to avoid dust generation. Workers will not jump over trenches. If workers must cross trenches, a trench bridge must be installed per OSHA specifications. If workers enter trenches, the competent person must be at the excavation any time workers are in trench. (Shoring or sloping for worker protection is required.)	M
	Strains from use of tools, such as shovels, could occur.	Maintain steady pace when using tools and take adequate rest periods. If possible, rotate tasks among the workers. Use appropriate tools for the task and maintain tools in good condition.	M

AHA #4 – Excavation and Backfilling			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Excavate (con't)	Heavy equipment hazards could be present.	Equip all heavy equipment on this project with rollover protection systems and backup alarms. Stay clear of moving equipment, unless necessary. If working near equipment, workers must be in visual contact with the operator. Inspect all equipment daily, before use, to ensure that proper maintenance is being performed. Make eye contact with operator; heavy equipment has right-of-way. Workers will not work under any equipment or loads.	M
	Workers could fall into excavation.	As required by EM 385-1-1 and EHS 3-8, Fall Protection, if the excavation is 6 feet or greater in depth, workers must be at least 6 feet from the edge of the excavation. If workers must be closer, they must use personal fall protection (full body harness, lanyard or retractable life line, anchorage point). If excavation is less than 6 feet deep, workers should stand at least 2 feet from the edge of the excavation.	M
2. Backfill with clean sand to develop a base for the water service line to be installed	Workers could be struck by or against heavy equipment or trucks.	Wear high-visibility safety vests. Avoid equipment swing areas. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals.	M
	Damage to utilities could occur.	Ensure that utilities are protected from the fill material as it is being placed. Be sure that fill material does not contain rocks or objects that could damage the utilities. Follow the Work Plan for proper placement and compaction of backfill.	
	Haul trucks could enter excavation.	Use spotters to ensure haul trucks maintain safe distance from excavation edge. Regularly monitor integrity of excavation sides.	
4. Backfill removed soil and compact.	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a Traffic Control Plan. Wear reflective warning vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers as necessary to direct the excavator as well as any nearby traffic.	M

AHA #4 – Excavation and Backfilling		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Heavy equipment (excavators or backhoes), dump trucks	Only qualified persons may operate equipment. Operators' manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate trucks. Excavation competent person must be on site during excavation activities (to be determined).	Daily and before use. Use inspection checklists. Excavation competent person must be on-site during excavation activities.
Equipment, hand tools	Specific training for equipment and hand tools will be provided.	Inspect all equipment and tools before each use. Discard defective hand tools.
Power tools	Review operators' manual for each tool and ensure that directions are followed.	Inspect before each use. Tag out defective power tools and report them to the supervisor.
Generator	Operator's manual must be on-site and operators must follow instructions for safe use.	Inspect as required by manufacturer.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CFR – Code of Federal regulations
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
DMV – Department of Motor Vehicles
EHS – Environmental Health and Safety
EM – Engineer Manual
PESM – Project Environmental Safety Manager
PPE – personal protective equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

ACTIVITY HAZARD ANALYSIS (AHA) #5

Job/Task: Install Water Service Line	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

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

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

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

AHA #5 – Install Water Service Line

Job Steps	Hazards	Controls	RAC
1. Install pipeline, valves, and instruments	Use of crane or other heavy equipment to lift pipe into position with improper rigging could cause injury to workers should the load drop.	Ensure proper rigging of load. Never stand under a load. A rigger (competent) person must inspect all rigging before each use. Refer to EM 385-1-1 Section 16.S., Hydraulic Excavators, Wheel/Track/Backhoe Loaders Used To Transport Or Hoist Loads With Rigging.	M
	Swinging loads could cause injury to nearby workers.	Use a tag line. Never work under a load.	M

AHA #5 – Install Water Service Line			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Install pipeline, valves, and instruments (con't)	Improper connection of valves could cause inadvertent release of materials into the environment or expose workers.	Ensure all connections are secure before performing any testing with air or fluids.	M
	Use of glues could cause exposure of workers to fumes.	Review MSDS of glues used. Wear protective gloves as required.	L
	Use of a butt fusion welder could cause thermal burns to worker, cuts to hands.	Qualified operator required to operate butt fusion welder. Wear leather work gloves. Ensure that all welded parts are cool before handling (Note meet required "resident" time before pipeline is moved after welding.)	M

AHA #5 – Install Water Service Line		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Heavy equipment (excavators or backhoes), dump trucks	Only qualified persons may operate equipment. Operators' manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate trucks. Excavation competent person must be on site during excavation activities (to be determined).	Daily and before use. Use inspection checklists. Excavation competent person must be on-site during excavation activities.
Equipment, hand tools	Specific training for equipment and hand tools will be provided.	Inspect all equipment and tools before each use. Discard defective hand tools.
Butt fusion welder	Qualified and trained operators (certificate)	As required by manufacturer.
Rigging	Competent person (TO BE NAMED) must have experience and training in performing and inspecting.	Inspect as required by EM 385-1-1 Section 15.
Power tools	Review operators' manual for each tool and ensure that directions are followed.	Inspect before each use. Tag out defective power tools and report them to the supervisor.
Generator	Operator's manual must be on-site and operators must follow instructions for safe use.	Inspect as required by manufacturer.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on use.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1.

AHA #5 – Install Water Service Line

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CFR – Code of Federal regulations
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
DMV – Department of Motor Vehicles
EHS – Environmental Health and Safety
EM – Engineer Manual
HDPE - High-density polyethylene
PESM – Project Environmental Safety Manager
PVC – polyvinyl chloride
PPE – personal protective equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

ACTIVITY HAZARD ANALYSIS (AHA) #6

Job/Task: Hydrostatic Line Testing and Supply Line Disinfection	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		

Contract Number: **N40085-11-D-0043** / Date Prepared: **March 2012**	**Severity**	**Probability**				
		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**	Marginal	**H**	**M**	**M**	**L**	**L**
	Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

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

AHA #6 - Hydrostatic Line Testing and Supply Line Disinfection

Job Steps	Hazards	Controls	RAC
1. Hydrostatic Testing	General Safety precautions and procedural guidelines	Follow ASTM F 2164, Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure. Follow Construction Site Procedure (CSP)-204, Piping and CSP-205, Pipe Testing, Flushing and Cleaning.	M

AHA #6 - Hydrostatic Line Testing and Supply Line Disinfection			
Job Steps	**Hazards**	**Controls**	**RAC**
1.Hydrostatic Testing (con't)	Ruptures/Leaks	Safety is paramount because testing under pressure may cause violent rupture or failure. Use clean water for hydrostatic test (no air or process water allowed) Do not exceed tank & valve pressure ratings. If a leak is detected, relieve pressure prior to repair or adjustment. No tightening or adjusting while under pressure. Relieve & confirm pressure when testing is complete.	H
	Dropped Objects	ANSI approved steel toe boots will be worn.	M
	Struck By/Caught Between	When it is necessary to observe/test energized equipment, the following precautions should be taken: Barriers will be established to prevent equipment and people from entering a work area. Personnel will keep hands/loose clothing away from moving parts. Personnel will be briefed on emergency shutdown procedures. Only necessary guards will be removed to observe/test equipment. All lockout/tagout procedures will be followed, if manual tests on any of the equipment is performed. Personnel shall stand to the side when opening & closing valve assemblies.	L
	Flying Objects and Debris	ANSI approved safety glasses will be worn. ANSI approved safety goggles and splash shields will be worn if a splash potential exists.	M
	Slip/Trip	Personnel will clear walkways of equipment & materials. Other obstructions will be marked, identified or barricaded. Tripping and poor footing hazards will be repaired as they are discovered or will be clearly identified. Even terrain will be utilized for equipment use.	M
	Electrocution/Contact with Electricity	Live parts of wiring or equipment shall be guarded to protect all persons or objects from contacting them. Plugs & receptacles shall be kept out of water unless they are of the approved submersible type. Cords will be kept from heat and sharp edges. All electrical tools and equipment will be equipped with GFCI.	M

AHA #6 - Hydrostatic Line Testing and Supply Line Disinfection			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Supply Line Disinfection	Use of 0.2 ppm concentration of chlorine in water, contact with skin or eyes, splashing. Contact may cause irritation or dermatitis Inhalation of chlorine vapor.	Use proper PPE including safety goggles when handling chlorine. When applying mixture ensure that rubber gloves are worn along with a long sleeve shirt. Avoid contact with chlorine on skin or work clothes. Avoid prolonged inhalation, use caution when mixing and work in a well-ventilated area.	M

AHA #6 - Hydrostatic Line Testing and Supply Line Disinfection		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Equipment, hand tools	Specific training for equipment and hand tools will be provided.	Inspect all equipment and tools before each use. Discard defective hand tools.
Generator/Pump	Operator's manual must be on-site and operators must follow instructions for safe use.	Inspect as required by manufacturer.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
ANSI - American National Standards Institute
APP – Accident Prevention Plan
ASTM - American Society for Testing and Materials
CFR – Code of Federal regulations
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
CSP – Construction Site Procedure
EM – Engineer Manual
PESM – Project Environmental Safety Manager
PE – polyethylene
PPE – personal protective equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

ACTIVITY HAZARD ANALYSIS (AHA) #7

Job/Task: Abandon Groundwater Wells	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location**: Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

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

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

AHA #7 – Abandon Groundwater Wells

Job Steps	Hazards	Controls	RAC
1. Park contractor vehicles carrying drill rig and equipment.	Vehicle could hit someone or something.	Use spotters when positioning vehicle if needed. Ensure spotters know how to communicate with driver of vehicle.	L
	Location could create a traffic hazard.	Locate vehicle in an area that will not obstruct traffic.	

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
2. Unload equipment and materials.	Load could have shifted during transport or be poorly tied down, causing load to be unstable.	If load has shifted or tie-downs are poorly installed, do not stand near truck or load. If necessary, remove each tie-down carefully and position heavy equipment on side where tie-down is being removed to prevent load from falling on that side.	M
	Lifting of equipment and materials from vehicle could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	M
	Cuts and abrasions could occur while moving equipment and materials.	Use leather gloves when moving objects with sharp contact points.	L
	Slip, trip, and fall hazards could be present.	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards. Only work on walking/working surfaces that have the strength and integrity to support employees safely. Openings 18 inches or more in diameter must be covered and marked. All openings less than 18 inches in diameter and all holes must be marked or barricaded.	L
3. Inspect rig.	Improper inspection of rig could cause workers to be exposed to hazards associated with operating mechanical devices.	Ensure that rig and all associated equipment are inspected by a competent person and that rig is in safe operating condition. Inspect equipment; including brakes, tire pressure, cables, and hydraulic and pneumatic hoses, before use and at start of each shift. Tag and remove from service faulty or unsafe equipment. Verify that emergency shutdown systems (at least two) are clearly marked, and all site workers know locations. Verify that shutdown systems work properly when trip wires are pulled or pushed. Implement EHS 6-2. Operator's manual must be available and reviewed prior to operation.	M

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
4. Position and set up rig and associated equipment.	Failure to review site layout plan could cause exposure to potential hazards such as electrocution, damaging of underground utilities, or tipping rig over in unstable soil conditions.	Do not move drill rig into any work area until site layout plan has been completed and route of travel to any work site has been assessed for hazards (overhead lines and stability of roads and ground). At the pre-activity safety briefing, discuss site layout plan and analysis of route of travel, along with AHAs. Use a spotter for positioning as necessary. Set brake and place wheel chocks under front wheels of mobile rig. Extend stabilizer jacks and ensure footing is sound. Vehicle must be level to vertical and horizontal planes. Do not position wheels (loads) or rig over manholes, vaults, valve boxes, etc. Do not place rig within 15 feet of any overhead electrical lines. Verify voltage of any overhead power line. If any lines are above 50kV, the clearance must be greater. Refer to EM 385-1-1; Section 11; Table 11-1 for clearances required for voltage above 50kV.	H
	Worker could become pinned between rig and other truck components, or worker could be pinned under rig if rig is serviced from under the truck.	When any part of rig or equipment is in motion, stand far enough away from moving parts to avoid being pinned between moving parts. Do not work under rig or truck while rig is supported by lifting jacks. If work must be done under rig or truck, drill crew supervisor must contact SSHO to ascertain a safe method for lockout of equipment to ensure that adequate blocking is installed.	H
	Worker could be exposed to noise.	Wear earplugs whenever drill rig is in operation, if necessary. Check that noise is not in excess of 84 dBA. (Most drilling operations require hearing protection.)	L
	Worker could be exposed to pinch points, which may cause loss of limbs, hands, fingers, toes, etc.	Avoid placing hands close to moving machinery. Wear leather gloves, as appropriate. (Do not wear gloves when near moving parts as gloves or clothing may become entangled in the moving part.). Wear steel-toed boots.	M

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
4. Position and set up rig and associated equipment. (con't)	Electrocutions, explosions, disastrous events, etc. could occur.	Examine copies of all pertinent drawings prior to performing task. Locate and mark existing underground utilities with universal marking codes. Call National One Call, 811, prior to work. Inspect area of drilling activity for overhead obstructions. Contact service facility engineer before working near utilities. Ensure that weight of rig is evenly distributed on ground and is not so heavy as to damage any underground lines that may be near surface (e.g., shallow PVC lines).	M
	Air hoses or hydraulic hoses under pressure could suddenly release, whip, and hit workers causing severe injury.	Do not disconnect air hoses and compressors until hose line has been bled. Visually inspect all connections of any lines under pressure. Use safety clamps (whip checks) to connect each side of connection to other if connection breaks (safety clamps will keep hoses from whipping under sudden release of pressure). Tie back or attach hoses wherever possible to minimize length of hose that could whip around if there is sudden release of pressure.	M
5. Construct decontamination pad.	Handling plastic liner material - roll could fall or roll on person causing injury.	Never work under a roll. Use mechanical means to lift and carry roll of liner.	M
	Cut while cutting liner with blade.	Always cut away from body. Never place blade in any pocket. Wear leather work gloves and cut resistant gloves. Use a self-retracting blade.	M
	Slipping on wet liner.	Avoid getting water on liner. Wear boots with slip resistant soles.	M
	Strain from lifting heavy sand bags.	Use proper lifting techniques do not lift and throw bags. Wet bags should not exceed 35 pounds.	M
6. Pull pump motor, pump and discharge pipe.	When pulled out the extracted material could swing out and hit workers.	Ensure that workers stand away from extraction point.	M

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
7. Unscrew pump segments	Injury from handling pipe. Pipe could fall on foot or other body part if it is not adequately supported.	Wear leather work gloves. Ensure pipe is adequately supported so that it cannot fall. Wear safety boots with steel or composite toe that meets ASTM standard.	M
8. Use cutting torch to cut pump segments if segments are too corroded.	Hot work could cause fire especially to nearby grasses.	Use a hot work permit, for either torch work or power tool cutting (cut-off saw). Ensure area has been wetted and is shielded from the hot work. Inspect area for at least one hour after the cutting and re-wet the area after performing the cut-off.	M
	Burns to skin.	Wear long sleeve shirts. Wear gloves and other protectors as needed.	M
	Eye injury due to torch intensity	Wear glasses with filter # 4 or better as required by EM 385-1-1.	M
	Pipe section could fall after being cut and fall on to worker.	Ensure section is adequately supported before the cut.	M
9. Bail out lubricating oil from top of groundwater, if necessary.	Contamination from groundwater. Weight of lifting water if manually lifted and handled.	Wear appropriate PPE- nitrile gloves, disposable coveralls. Ensure bailer does not contain more than 4 gallons of water at one time (4 gallons weighs approximately 35 pounds).	M
10. Perforate liner as necessary per the work plan using a mechanical perforator.	Weight of handling mechanical perforator.	Ensure that unit does not weigh more than 50-pounds if handling the unit manually. (Presuming that this unit is typically attached to the drill rig for actual performance of the perforations.)	M
11. Measure depth of well using water-level sounder.	Exposure to contaminated groundwater.	Wear appropriate PPE- nitrile gloves, disposable coveralls.	L
12. Mix grout.	Lifting of materials could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	M

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
12. Mix grout. (con't)	Worker could be come into contact with grout.	Avoid spills. Wear designated PPE. Remove PPE properly and wash hands. Avoid generating dust. If high in silica content, wear dust mask when handling dry grout.	L
	Worker could be exposed to dust from bags of material.	Wear proper PPE for skin, eye, and breathing protection. MSDS for dry grout must be reviewed by all workers.	L
13. Lower tremie pipe with packer into the well.	Weight of tremie pipe while positioning and pipe could strike nearby workers.	When lifting pipe get the assistance of other workers. Ensure other workers stand back.	M
14. Pour or pressure-fill grout into well.	Lifting of materials could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	M
	Worker could be come into contact with grout.	Avoid spills. Wear designated PPE. Remove PPE properly and wash hands.	L
	Grout could cause probe rods to be slippery.	Wear gloves, as appropriate. Use extra caution while removing rods and handling them, as they are prone to slip.	L
	Air hoses or hydraulic hoses under pressure could suddenly release, whip, and hit workers causing severe injury.	Do not disconnect air hoses and compressors until hose line has been bled. Visually inspect all connections of any lines under pressure. Use safety clamps (whip checks) to connect each side of connection to other if connection breaks (safety clamps will keep hoses from whipping under sudden release of pressure). Tie back or attach hoses wherever possible to minimize length of hose that could whip around if there is sudden release of pressure.	M
15. Cut off top of well casing and liner.	Use of torch or Sawzall® could cause fires from cutting operation.	Use a hot work permit., for either torch work or power tool cutting (cut-off saw). Ensure area has been wetted and is shielded from the hot work. Inspect area for at least one hour after the cutting and re-wet the area after performing the cut-off.	M
	Exposure to flame.	Wear long sleeve shirts. Wear gloves and other protectors as needed.	M
	Cut by tool.	Follow manufacturer's directions for safe operation of tool.	M

AHA #7 – Abandon Groundwater Wells			
Job Steps	**Hazards**	**Controls**	**RAC**
15. Cut off top of well casing and liner (con't)	Eyes not protected from light of torch or from cutting of metal.	Wear glasses with filter # 4 or better as required by EM 385-1-1.	M
16. Finish with sealing material to surface with concrete as specified in work plan.	Worker could be come into contact with concrete or asphalt patch.	Avoid spills. Wear designated PPE. Remove PPE properly and wash hands.	L
17. Decontaminate all reusable materials and equipment.	Lifting of equipment and materials could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	M
	Worker could be exposed to chemical contaminants.	Avoid spills. Ensure that spill cleanup supplies are available. Wear required PPE and respiratory protection. Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection. Remove PPE properly and wash hands.	M
	Decontamination area may become slippery.	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards as feasible. Maintain proper illumination in all work areas. If decontaminating on plastic sheeting, use caution since plastic sheeting is extremely slippery. Wear boots with good traction.	M
18. Collect decontamination water using pump.	Electrocution if pump is electric. Hydraulic hoses could fail if pump is hydraulic.	Ensure pump is plugged into an outlet with GFCI protection. Inspect all cords for frays and breaks. Inspect all hydraulic hoses and connections. Use hose restraints (anti-whip) on all connections.	M

AHA #7 – Abandon Groundwater Wells		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Heavy equipment (drill rig, trucks.)	Operator's manual for each piece of equipment to be reviewed by operators and manufacturer's recommendations followed for safe operation. Each equipment manual maintained on site and available for review.	Only qualified/licensed and trained personnel will operate equipment.
Pumps, generators, etc.	Daily and before use. Follow manufacturer's directions.	Operators must be trained. Ensure operator's manual is available and on site.
Equipment (power tools, hand tools, torches, etc.)	Specific training for power tools and hand tools will be provided.	Inspect all tools before each use following manufacturers' requirements. Discard or tag out-of –service, any tools that are damaged. Do not use power tools that have frayed cords or exposed wiring. All power tools must have a grounding plug or be double insulated.
Power tools	Review operators' manual for each tool and ensure that directions are followed.	Inspect before each use. Tag out defective power tools and report them to the supervisor.
Generator	Operator's manual must be on-site and operators must follow instructions for safe use.	Inspect as required by manufacturer.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
ASTM – American Society for Testing Materials
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
dBA - decibels, A Scale
EHS – Environmental Health and Safety
EM – Engineer Manual
GFCI – ground fault circuit interrupter
kV – kilovolts
MSDS – material safety data sheet
PESM – Project Environmental Safety Manager
PPE – personal protective equipment
PVC – polyvinyl chloride
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc

Activity Hazard Analysis (AHA) #8

Job/Task: Waste Management (Including Waste Water Sample Collection)	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton, NY**	**Risk Assessment Code (RAC) Matrix**	
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title): **Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

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

Notes: (Field Notes, Review Comments, etc.)
In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

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Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

AHA #8 - Waste Management (Including Waste Water Sample Collection)

Job Steps	Hazards	Controls	RAC
1. Drum handling; decontamination water transfer	Musculoskeletal injury	If handling drums, use a drum dolly, or a drum grabber attached to a backhoe or excavator to move the drums to storage. Inspect the path that the drum must be moved over. Ensure that there are no ruts or other obstacles that can cause the drum to tip over, or be difficult to handle over the surface being traversed. Place drums in an approved storage area. When manually handling drums, avoid placing hands between the drums in order to avoid pinching the fingers. Wear leather work gloves. If drums must be manually positioned, use the "break & roll" method to move a drum. Avoid manually positioning drums if at all possible. Only one person should break & roll a drum if it must be manually moved without mechanical assistance.	M

AHA #8 - Waste Management (Including Waste Water Sample Collection)			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Drum handling; decontamination water transfer (con't)	Musculoskeletal injury (con't)	If transporting drums by pickup, use a truck that has a lift gate and move the drum onto the lift using a drum dolly. Make sure that the drum is secured and will not roll when the lift is raised Secure all drums in place on the truck.	M
		Use pumps to fill drums or tanks with decontamination water.	M
	Containers may leak and expose workers to chemical hazards.	Inspect all containers on a regular basis for leakage/condition. Have spill cleanup supplies and equipment readily available. The surface may become slippery. Wear work boots with good traction soles. Avoid exposure to the material, and wear appropriate PPE. Clean up all spills immediately. Notify the supervisor.	M
	Workers could be struck by, or against heavy equipment, or by traffic within/ adjacent the work sites.	Wear high-visibility reflective vests at all times while on site. Make eye contact with operators and drivers Understand and review posted hand signals. Use traffic barricades, signs, delineators, cones, flags, and backup spotters.	M
2. Collect waste water samples	Exposure to contaminants in groundwater waste water	Avoid contact with waste water. Wear PPE specified in SSHP: Nitrile or latex gloves, safety glasses and hard hat. Have spill cleanup supplies and equipment readily available. Clean up all spills immediately. Notify the supervisor. Visual inspection and ambient air monitoring during Well Abandonment task will determine selection of PPE and respiratory protection	M
	Back Injury	Do not lift more than 50 pounds at a time (unassisted). Use Team Lifting Techniques (no more than 100-pounds maximum). Use mechanical means to lift load.	M
	Worker exposure to extreme temperatures (Heat /Cold Stress	Monitor for temperature stress and implement prevention in accordance with EHS Procedure 4-6, Temperature Extremes. Provide fluids and rest breaks, as necessary. Implement procedures while wearing impermeable protective clothing.	M

AHA #8 - Waste Management (Including Waste Water Sample Collection)		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel name(s)**	**Inspection Requirements**
Site Vehicles/Waste Transport Vehicles	Drivers must have current State-issued driver's license. Trained and authorized personnel will operate off road vehicles. Qualified operators will be identified upon assignment.	Receipt inspection by Equipment Supervisor. Daily vehicle inspection by drivers. Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Heavy Equipment	Inspect daily, and before use. Use the form provided in the SSHP. Qualified operators will be identified upon assignment.	Only trained equipment operators may operate heavy equipment; Only Department of Motor Vehicles-licensed personnel will operate vehicles.
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators.
Fire Extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. (29 CFR 1926.50(d)(2)) First aid kits must be filled per EM 385-1-1.

Acronyms:

AHA – Activity Hazard Analysis
APP-Accident Prevention Plan
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
CFR – Code of Federal regulations
EM – Engineer Manual
EHS – Environmental Health and Safety
PESM- Project Environmental Safety Manager
PPE – personal protective equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) # 9

Job/Task: Site Restoration and Demobilization (Including Equipment Decontamination)	**Overall Risk Assessment Code (RAC) (Use highest code)**	**M**
Project Location: **Calverton NY**		
Project Name: **Peconic River Sportsman's Club Water Service Line Installation at NWIRP Calverton**		
Contract Number: **N40085-11-D-0043**		
Date Prepared: **March 2012**		
Prepared by (Name/Title**): Christine Joblon, Health and Safety Officer**		
Reviewed by (Name/Title): **Roger Margotto, CIH, CSP, Project Environmental Safety Manager (PESM)/Program CIH**		

Risk Assessment Code (RAC) Matrix

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

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

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Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

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

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)

Job Steps	Hazards	Controls	RAC
1. Accessing hydroseeder	Failure to inspect truck on arrival at site could cause potential damages to truck or other equipment and property. Malfunctioning truck could injure workers and others.	As required by the SHSP, the Site Superintendent, the operator of the truck and the SHSS will inspect the truck upon arrival at the site. They will ensure that the operator's manual is present and reviewed by the operator. Assure that brakes work. Inspect tires and other key components. If truck does not pass inspection, do not use until repairs are made. They will ensure that they have a mechanic's certification of inspection (obtained from a vendor or other licensed mechanic). This inspection will be documented and photographs of the equipment taken if the truck is leased by TtEC.	L

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)			
Job Steps	**Hazards**	**Controls**	**RAC**
1. Accessing hydroseeder (con't)	Slip, trip, and fall hazards.	Visually inspect truck, especially truck deck for slip, trip, and fall hazards. Truck will be inspected during daylight hours. When truck is loaded with water, slipping hazards may be created. Avoid creating this hazard and wear slip resistant boots.	M
2. Hydroseeding and placing erosion control mat.	Strains from manually moving materials and equipment.	Use proper lifting techniques, such as keeping back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use lifting devices whenever possible. Do not lift more than 50 pounds without help. This limit may be lowered by the SSHO after assessment of worker fitness level.	M
	Worker could fall off equipment	Use equipment footholds and hand holds provided for safe access. Do not carry materials since 3-points of contact must be made while climbing	M
	Worker may not properly be tied off or secured when hydroseeding	Ensure that contractor is following their work plan on fall protection.	M
	Communication when coordinating activities	Ensure that good communication exists between the truck driver of the hydroseeder and the person applying the seed mixture if two person operation applies.	L
	Struck by or pinned against heavy equipment.	Wear high-visibility safety vests. Make eye contact with operators before approaching equipment. Understand and review posted hand signals.	M
	Nozzle of hydroseeder could injure workers or damage property if used improperly.	Never point nozzle directly at people. Use nozzle in a fashion to avoid pointing it at any one location for an extended duration. Remove from the area any property that could be damaged. Nozzle must have the ability to be immediately shut off in the event of an emergency.	M
	Noise from hydroseeding operation.	Verify that noise levels do not exceed 84 dBA. If it does, worker(s) must wear hearing protection.	L
	Grass seeds may produce allergy symptoms in some individuals.	Select individuals that when exposed to grass seed will not experience allergy symptoms.	M

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)			
Job Steps	**Hazards**	**Controls**	**RAC**
3. Haul clean crushed gravel	Workers could be struck by or against heavy equipment or trucks.	Establish and follow a traffic control plan. Wear reflective high-visibility vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers, as necessary, to direct trucks, as well as any nearby traffic. Ensure proper illumination in all work areas.	M
	Drivers of trucks could be injured by loads as they are being placed in trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS).	M
4. Dump load at excavation site.	Workers could be struck by or against heavy equipment or trucks.	Provide spotters for dumping and/or direction of placement of loads. Ground workers will maintain distance from dumping truck and loaders. Dump trucks will maintain a safe distance from excavation edges when dumping. Workers will avoid standing near edges of excavations.	
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc. Never place body or head into the dump of a dump truck.	M
5. Use heavy equipment; dump trucks and paving equipment working in area.	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests. Make eye contact with operators before approaching equipment. Understand and review hand signals. Stay clear of moving equipment unless necessary. Identify and avoid pinch points.	M
	Defective equipment could cause injury to workers or damage to other equipment.	Inspect all equipment when it arrives on-site. All equipment must be certified as operable by a competent mechanic. Any equipment that does not pass inspection must not be used.	M
	Noise could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	M
	Equipment could strike trees and other objects located nearby, such as fences and buildings.	Operators must drive carefully. Any time equipment is backed up, the driver will either use a spotter, or the driver must visually clear the area before backing up.	M

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)			
Job Steps	**Hazards**	**Controls**	**RAC**
5. Use heavy equipment; dump trucks and paving equipment working in area. (con't)	Traffic in area could be affected by work.	Follow the site traffic control procedure. Obtain clearances for any traffic diversion, control, or closure.	M
	Slips, trips, and falls from various agents are potential hazards.	Work areas will be visually inspected and pre-existing slip, trip, and fall hazards will be marked, barricaded, or eliminated as feasible. Work areas will be kept neat and orderly. Proper illumination will be maintained in work areas. Inspect each work area for ground squirrel holes, other ruts, and obstructions. Visually inspect for soft soil.	M
6. Handling material	Strains, sprains, other injury could occur.	Use proper lifting techniques such as keeping back straight, lifting with legs, avoiding twisting, and getting help when moving bulky/heavy materials and equipment weighing more than 50 pounds. This limit may be lowered by the SSHO after worker fitness level assessment. Maintain communication with others involved in material handling.	M
	Unloaded material could fall on workers and injure them.	Workers will stand back from any load that is being unloaded.	M
	Working with hand tools such as shovels and rakes could injure workers.	Inspect all tools before each use. Remove defective tools from service. Handle tools properly. Avoid repetitive motions for an extended period of time by rotating tasks among the workers.	M
	Contact could occur with hot equipment such as burners, hoppers, etc.	Avoid touching hot parts of equipment. Wear protective gloves.	M
7. Working with hot asphalt	Contact with hot asphalt could occur.	Wear proper PPE (head, ear, eye, foot, and hand protection). The National Asphalt Pavement Association recommends: 1. Chemical goggles and an 8-inch minimum-size face shield. 2. Loose clothing in good condition with collars closed and cuffs buttoned at the wrist. 3. Glove gauntlets that extend up the arm worn loosely so that they can be easily flipped off if covered with hot asphalt. 4. Boots with tops at least 6 inches high and laced without openings through which asphalt could reach skin. 5. Cuffless pants that extend over tops of boots.	M

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)			
Job Steps	**Hazards**	**Controls**	**RAC**
8. Decontaminate equipment, as needed	Workers could be injured if they slip or fall.	Dry Decon backhoe and trucks prior to accessing roadways, in a paved area, to avoid creating and dropping soil onto roadways. Do not climb on backhoe/ truck tops, and avoid aggressive brushing/ brooming of soil. Wear PPE specified in SSHP. Avoid working on a muddy surface and wear slip resistant boots.	M
	Eye injury/skin contact with soil/dust	Thoroughly wash hands and arms after completing decontamination of equipment and doffing of PPE. Do not eat, smoke, and apply sunscreen lotion and other skin protection creams or lotions, etc., until hands are washed.	M
	Waste Handling	Take care when transporting waste on site. Dispose of used decontamination water in accordance with the Work Plan.	M
	Heat stress/Cold Stress risks	Monitor for heat/cold stress in accordance with EHS Procedure 4-6 "Temperature Extremes." Maintain fluid intake and take breaks as needed.	M
9. Demobilization	Failure to properly survey site could cause exposure to ground hazards.	Ensure that ground is free of hazards such as unstable soil on slopes of berms.	M
	Strains from manually moving tools and equipment.	Use proper lifting techniques (lift with legs, limit twisting motion, gets assistance when handling bulky materials.) Do not lift more than 50 pounds without assistance. This limit may be lowered by SSHO after assessment of worker fitness level. Use mechanical means when possible. Determine if mats can be lowered by mechanical means so that workers do not have to carry them down the slopes.	M
	Workers could get hands, feet or the body caught between equipment and the other objects or the ground.	Never position arms, hands, feet between moving and stationary parts. Never use arms, hand or feet to remove stuck material in gates, doors, etc.	M

AHA # 9 - Site Restoration and Demobilization (Including Equipment Decontamination)		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel name(s)**	**Inspection Requirements**
Heavy equipment (water trucks, hydroseeding unit mounted on a truck, excavator),dump trucks, pickup trucks, pavers, rollers	Only qualified/licensed and trained personnel will operate heavy equipment. Operator's manual for each piece of equipment to be reviewed by operators and manufactures recommendations followed for safe operation. Each equipment manual maintained on site and available for review.	Daily and before use. Use equipment safety checklists as required.
Equipment (power tools, hand tools, etc.)	Specific training for power tools and hand tools will be provided.	Inspect all tools before each use following manufacturers' requirements. Discard or tag out-of –service, any tools that are damaged. Do not use power tools that have frayed cords or exposed wiring. All power tools must have a grounding plug or be double insulated.
Flagging materials and signage	Provide flagger training.	Ensure that materials comply with Traffic Control Plan specifications. Inspect signage regularly.
Utility knife	Personnel using knives must review this AHA and be aware of the hazards of improper use and storage of the knife.	Before each use. Ensure blade retracts fully when not in use and that it can be locked in that position when not in use. Ensure blade is clean and sharp.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking (29 CFR 1926.50[d][2]). First aid kits must be filled per EM 385-1-1 Table 3-1.

Acronyms:

AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CFR – Code of Federal Regulations
CIH – Certified Industrial Hygienist
CSP – Certified Safety Professional
dBA - dBA – decibels, A-scale
EM – Engineer Manual
PESM – Project Environmental Safety Manager
PPE – Personal Protective Equipment
RAC – Risk Assessment Code
SSHO – Site Safety and Health Officer
SSHP – Site Safety and Health Plan
TtEC – Tetra Tech EC, Inc.

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APPENDIX C

LOCKOUT/TAGOUT PERMIT

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SES-TECH

LOCKOUT/TAGOUT PERMIT

Project Name: _____ Location: _____

SECTION A

DATE:_____ SHIFT:_____
EQUIPMENT DESCRIPTION:_____
EQUIPMENT LOCATION:_____
REASON FOR LOCKOUT/TAGOUT:_____
SUPERVISOR ON DUTY:_____
AUTHORIZED EMPLOYEE:_____
LOCKOUT LOCATIONS:_____

SECTION C

REQUESTOR:_____
NOTIFIER:_____
SHUT DOWN BY:_____
ISOLATOR:_____
VERIFIER:_____
APPROVED BY:_____

SECTION B ISOLATION INFORMATION | **SECTION D EQUIPMENT ISOLATION** | **SECTION F LOCKOUT/TAGOUT REMOVAL**

Device Description	Location	Isolation Position	Applied By	Lock #	Date	Time	Removed By	Date	Time

SPECIAL INSTRUCTIONS FOR REMOVAL OR RELEASING STORED ENERGY

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APPENDIX D

PPE SELECTION FORM

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Personal Protective Equipment Selection

TASK	HEAD	EYES/FACE	FEET	HANDS	BODY	HEARING	RESPIRATORY

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APPENDIX E

MEDICAL DATA SHEET

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SES-TECH

MEDICAL DATA SHEET
(Voluntary)

This brief data sheet should be completed by all on-site personnel and kept by the Site Supervisor or ESS during site operations. Your health & safety is our priority. Under HIPPA you are entitled to complete privacy in regards to your medical information. The information you provide below will be used only if a medical necessity arises and shared only with those who would need to know to assist in addressing the medical and/or workers compensation event.

SITE: **SES-TECH NWIRP CALVERTON PRSC Site**

NAME: _____

HEIGHT: _____ WEIGHT: _____ BLOOD TYPE: (if known) _____

ADDRESS: _____

_____

EMERGENCY CONTACT: _____
(Telephone Number): _____

DRUG or OTHER ALLERGIES:
_____

DO YOU WEAR CONTACTS? _____

HAVE YOU EVER BEEN HOSPITALIZED AS A RESULT OF A KNOWN CHEMICAL EXPOSURE? _____
DATE OF EXPOSURE ___ / ___ / ___
EXPOSURE INFORMATION: _____

WHAT MEDICATIONS ARE YOU PRESENTLY USING? _____
_____

DO YOU HAVE ANY MEDICAL RESTRICTIONS? _____
_____

NAME, ADDRESS AND PHONE NUMBER OF PERSONAL PHYSICIAN:
_____
_____

This form may contain personal or sensitive information – Protect Accordingly!
Destroy when no longer needed.

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APPENDIX F

WORK RULES

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GENERAL HEALTH AND SAFETY RULES

1. All site personnel must attend Site Specific Training/Orientation and attend any tail gate briefing prior to start of daily work activities (at the discretion of and as directed by SSHO).

2. Any individual taking prescribed drugs shall inform the SSHO of the type of medication. The SSHO will review the matter with the PESM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.

3. The personal protective equipment specified by the SSHO in the EHS plan(s) shall be worn by all site personnel. This includes hard hats and safety glasses that must be worn at all times in the active work areas.

4. All personnel must sign the site log and exclusion zone log when used at the site.

5. Personnel must follow proper decontamination procedures (and shower- only if needed) at the end of the work shift.

7. Easting, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the PESM to allow fluid intake during heat stress conditions.)

8. All lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.

9. All signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the SSHO.

10. No one shall enter a permit-required confined space.

11. All personnel must follow the work-rest regimens and other practices required by the heat stress program.

12. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.

13. No person shall operate equipment unless trained and authorized.

14. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.

15. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

HEALTH AND SAFETY WORK RULES
(CONTINUED)

16. Safety belts, harness and lanyards must be selected by the SSHO. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.

17. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.

18. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.

19. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.

20. Horseplay of any kind is prohibited.

21. Possession or use of alcoholic beverages, controlled substances or firearms on any site is forbidden.

21. All incidents, no matter how minor, must be reported immediately to the SSHO.

23. All personnel shall be familiar with the Site Emergency Response Plan.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with all regulations set forth by OSHA, the SES-TECH Environmental, Health and Safety Programs, the EHS plan(s), the client, SES-TECH Project Manager and SES-TECH SSHO.

APPENDIX G

HOSPITAL AND NON-EMERGENCY CLINIC ROUTE MAPS

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mapquest

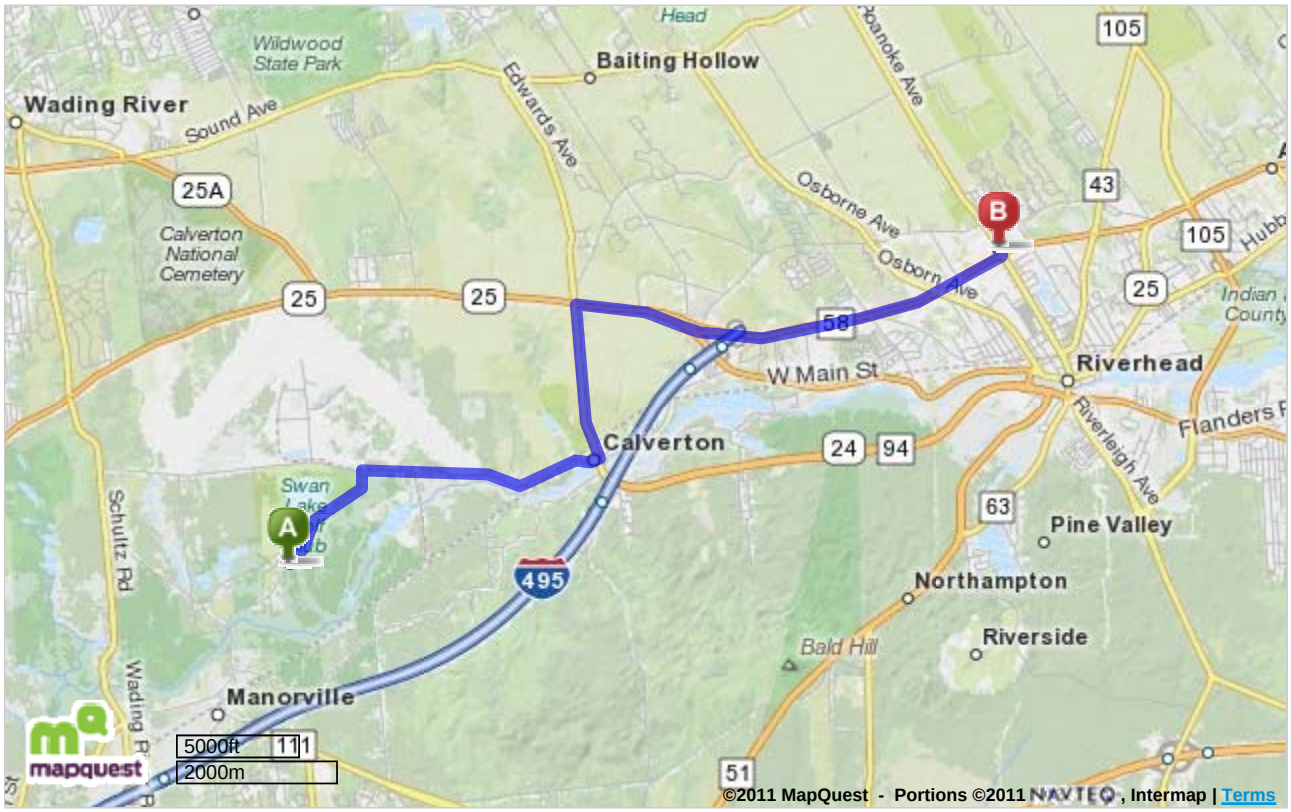
Trip to:
1300 Roanoke Ave
Riverhead, NY 11901-2031
8.93 miles
15 minutes

Notes

Figure 3 - Route Map to Central Suffolk Hospital

A		**389 River Rd** Manorville, NY 11949-1405	**Miles Per Section**
●		1. Start out going **northeast** on **River Rd** toward **Old River Rd**.	**Go 1.2 Mi**
↱		2. Turn **right** to stay on **River Rd**.	**Go 2.2 Mi**
↰		3. Turn **left** onto **Edwards Ave**. *Edwards Ave is 0.1 miles past Canoe Lake Dr* *If you reach Hill St you've gone about 0.5 miles too far*	**Go 1.4 Mi**
↱	EAST 25	4. Turn **right** onto **RT-25 E / Middle Country Rd**. *If you reach Riley Ave you've gone about 0.1 miles too far*	**Go 1.0 Mi**
↑		5. Stay **straight** to go onto **CR-58 E / Old Country Rd**.	**Go 3.0 Mi**
↱		6. Enter next roundabout and take the 3rd exit onto **Roanoke Ave**.	**Go 0.10 Mi**
■		7. **1300 ROANOKE AVE** is on the **right**. *Your destination is just past CR-58 W* *If you reach Middle Rd you've gone about 0.2 miles too far*	
B		**1300 Roanoke Ave** Riverhead, NY 11901-2031	**8.9 mi**

Total Travel Estimate: **8.93 miles - about 15 minutes**



mapquest

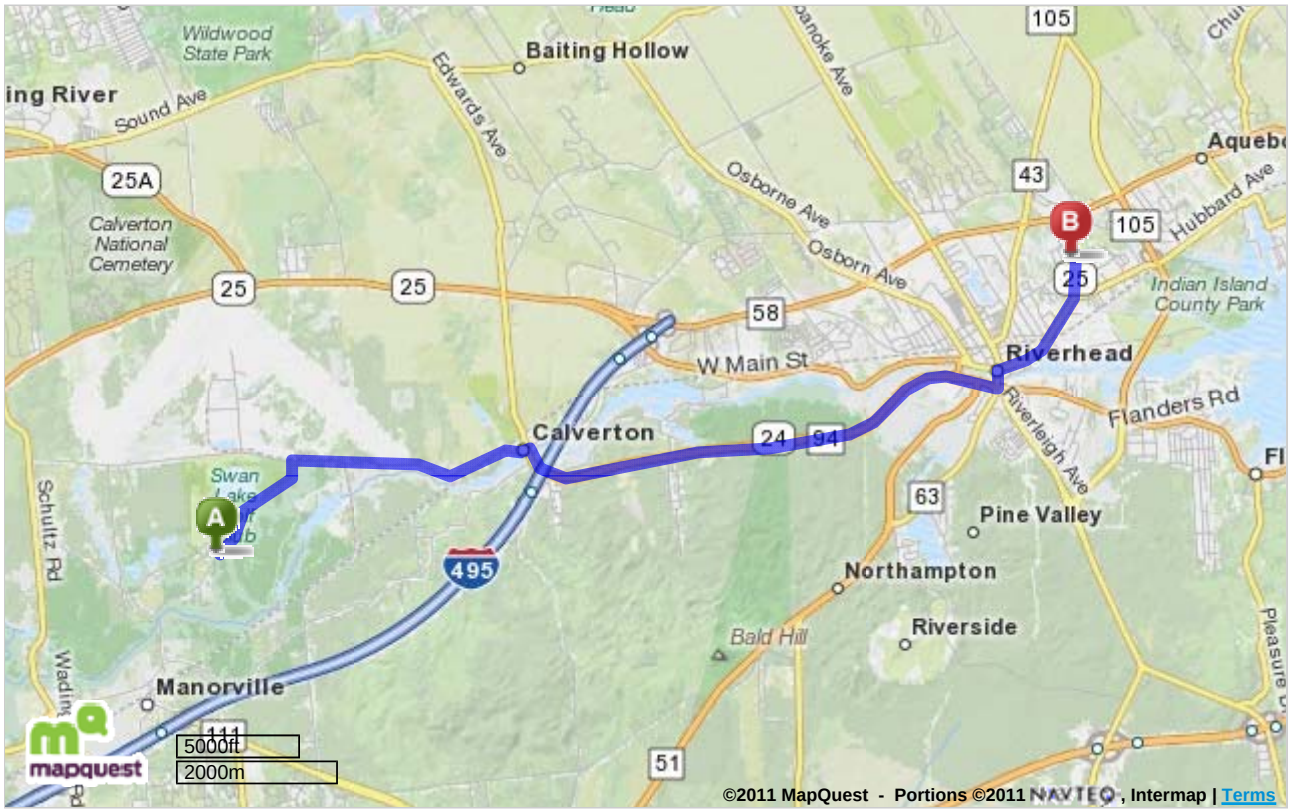
Trip to:
1228 E Main St
Riverhead, NY 11901-2675
9.49 miles
18 minutes

Notes

Figure 4 - Route Map to Occupational Work Care Clinic

A		**389 River Rd** Manorville, NY 11949-1405	**Miles Per Section**
●		1. Start out going **northeast** on **River Rd** toward **Old River Rd**.	**Go 1.2 Mi**
↱		2. Turn **right** to stay on **River Rd**.	**Go 2.2 Mi**
↱		3. Turn **right** onto **Edwards Ave**. *Edwards Ave is 0.1 miles past Canoe Lake Dr* *If you reach Hill St you've gone about 0.5 miles too far*	**Go 0.5 Mi**
↑	EAST 24	4. **Edwards Ave** becomes **RT-24 E / CR-94 E**.	**Go 4.1 Mi**
↗		5. Enter next roundabout and take the 4th exit onto **Peconic Ave**.	**Go 0.2 Mi**
↱	25	6. Turn **right** onto **W Main St / RT-25**. *Word of Life Ministries is on the right*	**Go 1.3 Mi**
■		7. **1228 E MAIN ST** is on the **left**. *Your destination is just past Sunrise Ave* *If you reach Segal Ave you've gone a little too far*	
B		**1228 E Main St** Riverhead, NY 11901-2675	**9.5 mi**

Total Travel Estimate: **9.49 miles - about 18 minutes**



APPENDIX H

IMPROVING INJURED WORKER CASE MANAGEMEN

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REVISED!

ZIP Bulletin No: 108
Improving Injured Worker Case Management

Preventing injuries is always our first priority. However, when an injury does occur, we have found that the overall severity of the injury and the amount of OSHA recordkeeping required for the injury can be greatly reduced when we implement effective case management. Injury cases are managed effectively when we consider them "life cycle" responses:

We are properly prepared prior to the injury to effectively respond

We notify and involve the right people from the moment the injury occurs. For Tt employees, this always includes notifying our primary medical provider, WorkCare at 800-455-6155 (available 24 hrs).

We continue to monitor the case throughout the diagnostic and treatment process until the injured worker returns to duty or leaves the company.

This ZIP bulletin provides steps that should be taken to improve case management.

What Actions Should We Take Before Field Work Begins?

- Contact WorkCare at the 800-455-6155, let them know you are with Tt, and obtain the name, address, and phone number for a local WorkCare-approved clinic.
- Enter this information in to the project Health and Safety Plan or Incident Prevention Plan (IPP).
- Post all emergency phone numbers with the route/map to hospital/clinic in vehicles and in trailers.
- Ensure that all site employees are aware of the emergency phone number listing, how to make the call, and the location of the route maps. Reinforce this message during safety briefings.
- "Map" the route to the clinic and hospital by driving the route as part of site mobilization.
- For Haz Waste sites, or other field work that has a potential for chemical or radiological contamination in an emergency event, it may also be necessary to visit the clinic and discuss emergency scenarios with their staff.

What Do I Do in an Emergency Situation?

1. Call 911 or your local emergency responder for initial employee evaluation and transport to the hospital. **A designated Tt employee should always accompany the injured worker to the hospital.**
2. Administer first aid to minimize the injury effects
3. Call WorkCare at 800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Mention as soon as possible that the call is regarding an emergency injury. At this point, the Occupational Health Nurse/physician will assist the supervisor to determine the best treatment plan. During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. Do not delay treatment while awaiting a return phone call.
4. Provide the following information to WorkCare:
   - Name of supervisor calling
   - Phone number

- Location calling from
- Name of individual injured
- Date and type of injury

5. Call your PESM ***Tami Froelich 509-372-5827 or 509-392-9080***
6. Call your Project Manager ***(insert name here if using this document as an IPP attachment)***

What is considered an Emergency?

Draw upon your first aid training/handbooks, past experience, or advice from a PESM or from a licensed health care professional; using your best judgment may prove most valuable.

Some physical signs/symptoms that require emergency medical treatment and a call to 911/ambulance service is provided.

- Chest pain
- Difficulty breathing
- Uncontrolled bleeding
- Bone fracture
- Loss of consciousness
- Severe head injury
- Poisoning
- Shock
- Loss of limb
- Sudden and prolonged dizziness

What do I do in an Non-Emergency Situation?

Follow Steps 2-6 as with an emergency (above). Transport the ill/injured worker to the clinic identified in the project's EHS plan or office's emergency plan. Encourage the clinic to use first aid treatment methods as recommended by Workcare. Workcare should be in direct communication with the clinic as soon as possible.

APPENDIX I

DAILY BRIEFING FORM

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DAILY BRIEFING SIGN-IN SHEET

Date: _____ Project Name/Number/Location: _____

Shift/Department: _____ Person Conducting Briefing: _____

1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):

2. OTHER ISSUES (EHS Plan changes, attendee comments, etc.):

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.

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APPENDIX J

WEEKLY AND MONTHLY HEALTH AND SAFETY REPORTS

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WEEKLY HEALTH AND SAFETY REPORT

Project Name: _____
Location: _____

SITE INFORMATION
Week Ending _____

Hours Worked :
Craft: PS: Subs: _____

Level of Protection
For the Week: B __ C __ D __

INJURIES AND ILLNESSES
Yes _____ No _____

Describe:
_____
_____
_____
_____

MAJOR ACTIVITIES CONDUCTED THIS WEEK:
(Drum handling, sampling, excavation, abatement/T&D, etc.)
_____
_____
_____

SIGNIFICANT EVENTS THIS WEEK:
(regulatory visits, equipment malfunctions, process start-up or shutdown):
_____
_____
_____

FUTURE ISSUES:
(schedule, manpower allocation, monitoring equipment, other resources needed)
_____
_____
_____
_____

SITE AUDIT/INSPECTIONS CONDUCTED Yes _____ No _____
(describe outstanding findings and attach results)
_____
_____
_____
_____

HIPO ACTIVITIES

Hot Work	Yes _____	No _____	Dates: _____
Lockout/Tagout	Yes _____	No _____	Dates: _____
Confined Space Entry	Yes _____	No _____	Dates: _____
Soils Analysis Classification	Yes _____	No _____	Dates: _____
Excavation Daily Check List	Yes _____	No _____	Dates: _____
Crane On-Site	Yes _____	No _____	Dates: _____
Critical Lift Plan Performed	Yes _____	No _____	Dates: _____

AIR MONITORING:
Real Time

Major Activity	Location(s)	Worker Occupation	FID/PID Range	CGI/O2 Range	PDM Range	Other

PERSONAL AIR MONITORING

Analyte	Activity Monitored	Occupation	Location	Result	Type of Sample*

SUBCONTRACTORS ON SITE

Company Name	Task or Function	Return to Site Next Week (Y/N)

Health and Safety Officer - Signature **Date**

SES-TECH
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**

TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
Work Conditions		
1. Housekeeping		
2. Walking/Working Surfaces		
3. Aisles and Passageways		
4. Platforms/Scaffolding		
5. Ladders		
6. Stairs, Guardrails, Toe-boards		
7. Exits/Egress		
8. Roadways		
9. Ventilation		
10. Lighting		
11. Noise Exposure		
12. Ergonomics (EHS 3-1, Attachment B)		
13. Site Perimeter and Control Zones Identified		
Equipment		
14. Hand/Portable Tool Condition, Storage and Use		
15. Machine, Conditions/Guarding		
16. Mobile/Heavy Equipment a. Physical inspection of equipment b. Review of daily inspection reports c. Review of equipment deficiency corrections logs/records		
Material Handling Equipment		
17. Hoisting and Rigging		
18. Lifting Aids Used When Possible		
19. Proper Lifting Techniques Used		
Electrical Safety		
20. Power Cords		
21. GFCI		
22. Generators		

SES-TECH
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**

TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
23. Breaker Box Access/Clearance		
Hazardous Materials		
24. Hazardous Chemical List Current		
25. MSDS		
26. Labeling		
27. Signs/Postings/Color Coding		
28. Proper Storage and Segregation of Hazardous Materials		
29. Compressed Gas Storage and Use		
Emergency Systems		
30. Emergency phone numbers posted		
31. Evacuation routes, rally points shown on site map		
32. Fire extinguishers inspected monthly		
33. Eyewashes and showers periodically inspected, units flushed, and fluids periodically changed		
34. First Aid Kits/Stations		
35. Emergency Rescue Equipment		
Protective Equipment		
36. PPE used, stored, and maintained in accordance with EHS plan		
37. Respirator use, storage, and maintenance		
Hazardous Waste Storage Area(s)/Satellite Accumulation Area		
38. Designated, secured area with "Hazardous Waste" signage. For SAA area is marked "SAA". (SAA)		
39. Containers:		
a. DOT-spec. containers (for wastes to go off-site only)		
b. Intact/in good condition		
c. Waste compatible with containers (e.g., no evidence of corrosion, softening, bulging)		

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**

TOPIC	OBSERVATIONS	FINDING (Y/N)
(SAA)		
d. Marked "Hazardous Waste"/ visible Accumulation Date. *For SAA, marked "Hazardous Waste"*		
e. Securely closed and stored to prevent rupture/leaking, except when add/remove waste. (SAA)		
f. For SAA only, Stored "at the point of generation" and meets quantity limits (Federal: 55 gal; check state requirements).		
40. Reactive/ignitable wastes stored at least fifty (50) feet from property.		
41. Liquid wastes within secondary containment (BMP, check WMP to determine state requirements).		
42. Incompatible wastes separated by a dike, wall, berm or other device.		
43. Stored for less than 90 days. *(CERCLA projects may have storage variance).*[1]		
44. Container tracking log accurately reflects containers stored. (SAA)		
45. Area maintained in an orderly fashion and complies with state/EHS plan requirements. (e.g. good housekeeping, adequate aisle space)		
Hazardous Waste Tank Storage Area		
46. Daily written inspection is being conducted and is maintained on site. Inspections include: a. Overfill/spill control b. Aboveground points of tank; monitoring/leak detection c. Surrounding area Cathodic protection systems are inspected bimonthly (& 6		

[1] If stored on-site 75 or more days, TSDF/transporter has been selected (EHS 1-4), pick-up date scheduled and PM/PESM are aware of 90-day limit.

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
months after installation)		
Waste/Stockpiles		
47. Refer to: a. Attachment C – Hazardous Waste Less Than 90 Days For Hazardous Waste Stockpiles; b. Attachment C – Solid Waste For State Regulated/Non-Hazardous Stockpiles; and/or c. Attachment C – PCB for PCB Stockpiles, if applicable		
TSCA PCB Wastes		
48. Inspected every 30 days at a minimum. Refer to PESM PCB Checklist		
Point Source Discharges		
49. Permit conditions are being met.		
50. Monitoring equipment is fully operational.		
51. Equipment calibrations and maintenance is up-to-date.		
52. Discharge sampling performed at required intervals.		
53. Review monitoring results *(Report permit exceedences per EHS 1-7)*		
54. DMR and Site Logs properly completed, signed, and submitted (if required).		
55. Fugitive Dust – Appropriate BMPs are instituted for fugitive dust emissions.		
Stormwater and other NPDES Discharge Activities		
56. SWPPP reflects current activities and has been updated as necessary.		
57. BMPs in SWPPP/Soil Plan implemented.		
58. Visual observations indicate stormwater meets water quality		

SES-TECH
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**

TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**
criteria.		
59. Stormwater BMP inspections conducted and documented as required (weekly and before/after > 0.5" storm event).		
60. Monitoring/sampling performed at required intervals.		
61. Review monitoring results if required. (*Report permit exceedences per EHS 1-7)*		
Other Conditions or Work Practices		
62.		
63.		
64.		
65.		

Reviewed by: _____ _____
Site Superintendent/ Site Manager Date

cc: Project Manager (monthly only)
PESM (monthly only)

SES-TECH
EHS WEEKLY/MONTHLY CHECKLIST AND ACTION ITEM REPORT

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Project/Location:	**Inspector/s:**	**Time/Date:**
TOPIC	**OBSERVATIONS**	**FINDING (Y/N)**

Review previous week's/month's Action Item Report. Carry forward action items that have not been implemented. Note outstanding action items with an (F) in the "Action Item" column on this report. Note an (F) in the "Date Completed" column on previous week's/month's Action Item Report.

Project:

Area of Inspection:

Inspection Type: ☐ **Weekly** ☐ **Monthly**

Date of Inspection:

ACTION ITEM	**RESPONSIBLE PARTY**	**SCHEDULE**	**DATE COMPLETED**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Reviewed by: _____ _____
Site Superintendent Date

cc: Project Manager (monthly only)
PESM (monthly only)

Attachment B

Resumes and OSHA Training Certificates

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Mr. Stavros Patselas, EIT
Project Manager - Civil/Environmental Engineer

EXPERIENCE SUMMARY

Over fifteen years' experience in the environmental and civil engineering, consulting, and construction industry, which include working at large scale international consulting firms, and a small regional environmental contractor. These varied work settings provided a broad range of investigative and remedial project experiences along with renewable energy project work and recent emergency petroleum spill response work. These diverse work background encompasses Federal/State/Local projects; mid to large size commercial, utility, industrial, and manufacturing investigation and remedial construction activities; and a broad range of emergency responses and associated closure.

EDUCATION

BS, Civil and Environmental Engineering, Pennsylvania State University, 1994

REGISTRATIONS/CERTIFICATIONS

Pennsylvania Engineer-In-Training

TRAINING

OSHA Hazardous Material Site Worker Refresher Course, March 2010
OSHA Waste Management Training, April 2009
Hazwoper medical examination, April 2009
U.S. DOT Hazardous Materials Training, November 2007
Tetra Tech EC Construction Supervisor Training, March 2005
Foster Wheeler Environmental Corporation Project Management 300 Training, March 2003
Foster Wheeler Environmental Corporation Project Management 200 Training, November 2001
OSHA Confined Space Entry Operations Supervisor, Attendant, & Entrant, February 2001
PADEP Land Recycling Training (Act 2), 1999
OSHA On-Site Management and Supervision Course, March 1997
OSHA Asbestos Abatement Contractor/Supervisor, EPA Model Accreditation Plan, 1996
OSHA Lead Management & Communications Training, October 1995
OSHA 40-hour Hazardous Material Site Worker Course (29CFR 1910.120), February 1995

CORPORATION PROJECT EXPERIENCE

Project Manager, Civil/Environmental Engineer, and Group Supervisor, May 2001 - Present
Tetra Tech EC, Inc., Langhorne, PA
Since 2004 supervise staff of three to fifteen engineers of either environmental, site civil, structural or geotechnical work experience. Responsibilities include integration of these engineers into various programs, projects, and proposal efforts. Directly manage group workload, resources, trainings, and goals as well as complete yearly performance appraisals.

Field Manager for approximately $4 million submerged oil assessment and recovery work associated with release of moderate to heavy crude oil into a waterway. Approximately 825,000 gallons of crude oil was released into a creek which flowed into the Kalamazoo River in southern Michigan near Marshall and Battle Creek. Managed field personnel that conducted qualitative assessment to delineate the extent of submerged oil over 40 river miles followed by quantitative sampling. Provided direct oversight of environmental sampling and sediment weep water treatment system operations associated with dredging of 3 submerged oil priority areas. Prepared standard operating procedures, work plans, and summary reports associated with submerged oil recovery from 23 priority areas. Transitioned submerged oil sites into operation and maintenance tracking and provided monitoring recommendations.

Responsible for approximately $14 million combined budget on two separate federal department of defense projects located in Long Island, New York. A $1 million project located in Nassau County, NY

includes design, build, operation, and maintenance of a highly time critical and community sensitive soil vapor extraction containment system. Treatment system details include twelve soil vapor extraction wells, a flow monitoring station, two blowers, a moisture separator, and vapor phase carbon. The project is design, built, and operating within six months while under state regulatory and local municipality oversight. Volatile organic compound concentrations in nearby residences have decreased since system started to levels below indoor air quality guidelines.

A $13 million project located in Nassau County, NY includes a three-phased pre-design investigation, remedial design, and construction of a groundwater pump and treat system. Completed remedial design led to construction phase followed by operation and maintenance. Project features include: utility easement project location surrounded by dense residential area, three 12-inch diameter recovery wells, surface discharge of treated groundwater, a pre-engineered building, air stripping, liquid and vapor phase carbon treatment, 1,100 gallon per minute design flow, utility connections, and access road construction. Responsibilities of both projects includes managing all facets of project including: direct client interface, control of scope, budget, schedule, and quality, change management, community relations including presentations at public meetings, development of work plans, health and safety plans, statements of work, technical specifications, and design drawings, subcontractor management, and continuous interface and negotiations with utilities, local municipalities, and state agencies.

A previously completed $3 million remedial project located in Suffolk County, NY included a pre-design groundwater investigation followed by design, construction, operation, and maintenance of an air sparge and soil vapor extraction remedial system. The system goal is for removal and concentration reduction of the volatile organic compounds related to fuel products in the site soils and groundwater. Project features include eight soil vapor extraction wells, eighteen air sparge wells, 60 and 75 horsepower blowers with variable speed drives, a heat exchanger, vapor phase carbon treatment, an exhaust stack, and a fabric structure.

Serve as Project Engineer on five wind energy projects. Responsibilities included preparation of design criteria documents, conceptual design of access road layout to the turbine locations as well as interconnect routing, site civil design, geotechnical desktop studies, historical research of surface and deep mine locations, and turbine foundation design. Site civil design included access road dimensions and slopes, determination of appropriate turning radius based on largest equipment, storm water management and culvert design, and location of material laydown areas, crane pads, and construction entrances. Prepared statements of work for geotechnical drilling and analysis, land survey, aerial mapping, and geophysical survey.

Served as the Resident Inspector / Engineer during construction of a groundwater treatment plant located in Blue Bell, PA for the Pennsylvania Department of Environmental Protection – GTAC III Contract. Provide complete third party oversight as the on-site representative for the client (PADEP) as well as the design engineer during all phases of construction. Responsibilities include: observing and documenting on-site activities, managing construction and design changes, assessing daily activities for conformance to industry standards and regulatory compliance, tracking material and equipment that enter or exit the site, review and approve certified payrolls for general contractor and subcontractors, review and approve monthly as-built drawings, prepare and negotiate the general contractor's monthly progress invoices, handle various public relations issues, conduct daily client interaction (external & internal), and complete project closeout. The total cost for the construction phase followed by one-year operation and maintenance was over $5.7 million.

Project Manager during preparation of plans and specifications for the Industrial Solvents site project located in York County, PA for the Pennsylvania Department of Environmental Protection – GTAC III

Contract. Responsible for budget, project team coordination, task distribution, schedule for deliverables as well as the overall scope of work during development of design plans, specifications, and other support documentation. Participated in final design meetings with the client to review all bid documents prior to public bid advertisement.

Serve as Site Quality Control Manager during construction of Groundwater Extraction and Treatment System Infiltration Gallery in Brunswick, Maine for the U.S. NAVY - Engineering Field Activity Northeast Remedial Action Contract. Responsible for performing inspection and surveillance activities and for documenting results of these activities as required achieving the quality of construction goals required by the technical specifications and drawings. Conduct three phases of control (Preparatory, Initial, and Follow-Up) to ensure construction complies with contract requirements. Also, assist Project Site Superintendent in daily construction activities, supervision of subcontractors and craft labor, and control of materials and equipment.

Support investigation and remedial activities at three former Manufactured Gas Plant (MGP) sites located in Delaware, New York, and North Carolina, respectively. Investigation activities include site history information gathering, identification of data gaps from previous investigation activities, preparation of site maintenance and remedial investigation plans, and performing multi-media sampling programs. Remedial activities include interpretation of investigation data, preparation of feasibility study along with construction and engineering estimates, plan and specification development, task scheduling including personnel, equipment, waste disposal, and material delivery, subcontractor procurement, and performing construction and engineering oversight.

PREVIOUS EXPERIENCE

Project Manager/Engineer, July 1998 - May 2001
Lewis Environmental Group, Royersford, PA
Direct and supervise Project Management Group in proposal preparation and management of remedial projects. Remedial construction activities include personnel and equipment scheduling, work plan preparation, waste disposal and material delivery arrangements, and procuring subcontractors/vendors. Manage projects through developing site-specific operations and health and safety plans, obtaining necessary permitting, obtaining waste disposal authorization, developing necessary plans and specifications, and preparing construction documentation. Projects have involved contaminated soil delineation, removal, and disposal; cleaning and maintenance of large aboveground bulk storage tanks; facility demolition; Manufactured Gas Plant (MGP) remediation; and underground storage tank (UST) removals and necessary contamination remediation.

Recent MGP remediation activities include sites located in Lewistown, Pennsylvania; and Ashland, Pennsylvania. For Lewistown, coordinated the excavation, transportation, and disposal of purifier waste, importing and spreading pebble lime for soil pH neutralization and appropriate restoration as a material storage area. At Ashland, provided activity coordination and field oversight of two subsurface gasholder removals and mercury decontamination of a building prior to demolition.

Completed remedial projects include: design, operation, and maintenance of an on-site wastewater treatment system consisting of filter sand, granular activated carbon, and ion exchange resin in York Haven, Pennsylvania; removal of 12,000 tons of arsenic and lead impacted soil in Warminster, Pennsylvania; in-situ soil and groundwater treatment with Oxygen Release Compound (ORCâ) in Boyertown, Pennsylvania; the decontamination and demolition of a bulk fuel terminal in Hightstown, New Jersey; material removal, facility cleaning, and investigation activities for a major bulk highway material supplier in Pittston, York, Northumberland and Reading in Pennsylvania and Pennsauken in New Jersey; and sediment removal and channel reconstruction with by-pass pumping for a paper pulp plant in Downingtown, Pennsylvania.

Perform various UST projects, including remediation and closure via the Pennsylvania Land Recycling Act (ACT 2), especially in relation to the December 1999 UST conformance deadline. Tank sizes have varied from single 550-gallon installations to multiple 20,000 gallon or greater installations. UST contents have included various petroleum products, liquefied petroleum gas, acids, caustics, and other chemicals.

Completed emergency response clean-up projects as Project Manager, Supervisor, Foreman and General Laborer include: Hurricane Floyd clean-up and recovery in several communities along the Schuylkill River in Montgomery County, Pennsylvania, a major truck terminal fire in northeast Philadelphia which included work on the Delaware River and several tributary creeks, Schuylkill River clean-up from fuel oil release at a steam generation facility in Philadelphia, a fuel oil release at a bulk aggregate plant in Northampton, Pennsylvania, a chemical release on the Northeast Extension of Pennsylvania Turnpike, a chemical release at nuclear power generating facility in Montgomery County, Pennsylvania, and up to eight gas station releases in Philadelphia region, New Jersey and Delware.

Completed industrial cleaning projects include: aboveground storage tank (AST) cleanings and inspections for major oil distributors in Philadelphia region and a pharmaceutical manufacturer in West Point and Danville, Pennsylvania; and line cleaning of various laboratory wastes for a major chemical manufacturer in Deep Water, New Jersey

Civil/Environmental Engineer, May 1995 - July 1998
Tetra Tech NUS, Inc., King of Prussia, PA
Site Manager for the investigation of five potentially hazardous CERCLA sites in the EPA Region III ARCS projects. These consisted of four Preliminary Assessments and one Site Inspection Prioritization located in Pennsylvania, Virginia, and West Virginia. Fieldwork included obtaining background information; sampling of domestic, recovery, and monitoring wells; sampling surface soils, sub surface soils, and sediments; sampling surface water; and conducting soil gas surveys. Designed, constructed, operated, and maintained a temporary activated carbon wastewater treatment system with flow rate of 75 gallons per minute in Exton, PA. In addition, provided field design test oversight for an air sparging/soil vapor extraction system and an in-situ materials precipitation system in Williamsport, PA.

Field Operations Leader for operations and maintenance of remedial treatment systems, petroleum storage tank projects, and report preparation. Operations and maintenance projects included an air sparging/soil vapor extraction system pilot study consisting of five extraction wells ranging with a total depth range of 20 to 62 feet below ground surface and one injection well with a total depth of 66.5 feet below ground surface. Petroleum storage tank projects included the removal of one UST and six ASTs. Developed the contamination nature and extent, site background, and field investigation portions in a Remedial Investigation/Feasibility Study (RI/FS) for a Navy CLEAN Contract. Prepared two Corrective Measure Study reports supporting a RCRA Facility Investigation.

Supervised subcontractor activities for a time critical removal and disposal of petroleum contaminated soil and water from basement of a future bank in Somerville, NJ. Additional remedial activities included the decontamination of basement walls and brick columns, design and installation of piping for subsurface monitoring and ventilation systems, sealing existing wall openings, and backfilling.

Site Manager for eleven Transaction Screen Processes of an Environmental Site Assessment involving a telecommunications client. Conducted extensive research including the review of government and historical records, fire insurance maps, and aerial photographs for residential, commercial, and industrial properties in southeastern Pennsylvania.

PROFESSIONAL AFFILIATIONS

American Hellenistic Education Progressive Association (AHEPA)

HAZARDOUS MATERIALS

HANDLING & TRANSPORT TRAINING CENTERS

FLANDERS, NEW JERSEY

This is to certify that

STAVROS G. PATSELAS

Certificate # *95-0406*

has successfully completed the course entitled

HEALTH & SAFETY FOR HAZARDOUS WASTE OPERATIONS

29 CFR 1910.120 (e)(3)(i)

J. Barmon Turner	*02/06/95*	
CENTER DIRECTOR	DATE	INSTRUCTOR

TRAINING CERTIFICATION

This certifies that

Stavros Patselas

Has successfully completed the following training:

OSHA 1910.120 (e) (8) REFRESHER TRAINING

Date(s) March 29, 2012 **Instructor(s)** 

Location Langhorne, PA

Alan Sherman

Sr. Regulatory Compliance Specialist

503730

TETRA TECH

American Red Cross

This recognizes that

Stavros Pastelas

has completed the requirements for

Adult CPR/AED

First Aid

conducted by

Lower Bucks County

Date Completed 05/04/2011

The American Red Cross recognizes this certificate as valid for 2 year(s) from completion date.

Attachment C

Corporate Safety and Health Policies

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Environmental Safety and Quality Policy

Tetra Tech EC, Inc. (TtEC) is committed to ensuring the health, safety, and well being of our employees and the communities in which we work, enhancing and protecting the environment, and providing quality services to our clients. Our Environmental, Safety and Quality (ESQ) Policy provides the framework and underlying principles for our Environmental Management System and is an integral part of how we conduct business.

All TtEC associates have the right to work in a safe and healthful workplace as well as the responsibility to help create and work in a safe and environmentally protective manner:

- We will complete our work successfully, with a great deal of attention to health and safety by:
  - Incorporating pollution prevention and loss prevention principles into our work process.
  - Employing well-trained personnel who understand and have the knowledge to fulfill their ESQ responsibilities.
- We will fully comply with all laws and regulations pertaining to our business, as well as, company policies and procedures
- We will commit ourselves to complying with the terms of our contracts and to meeting the four project objectives—knowing scope, budget, schedule, and level of quality.
- We will provide the level of quality our internal and external clients expect and pay for and use its attainment as our measure of success.
- We will safely and properly plan our work and work our plan.
- We will communicate and document the execution of our work.
- We will gather data and make decisions inclusively and involve employees and others affected by ESQ decisions inclusively.
- We will dedicate ourselves to continuous improvement by:
  - Establishing and periodically updating ESQ improvement objectives and targets.
  - Recognizing outstanding employee and project ESQ performance.

These commitments are defined in, and are fundamental to, our Client Service Quality ®, Do It Right®, and Shared Vision®, Zero Incident Performance® operating philosophies.

TETRA TECH EC, INC.

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Corporate Health and Safety Program Procedures List

EHS 1-4: Subcontractor Selection and Management
EHS 1-7: Incident Reporting and Investigation
EHS 4-2: Hazard Communication and Training
EHS 3-15: Underground Utilities
EHS 6-3: Excavation and Trenching Program
PP-14: Substance Abuse Program
EHS 4-6: Temperature Extremes

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Zero Incident Performance®

We value the safety and well being of all associates. We work on the premise that all accidents are preventable. Our goal of Zero Incident Performance® is supported by the integration of safety concepts, principles and practices into each work effort and project phase.

Zero Incident Performance®

Zip

Do it safe... Do it right

TETRA TECH EC, INC.

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Zero Incident Performance® Pledge

As a member of the Tetra Tech EC, Inc. Team,
I am dedicated to the goal of Zero Incident Performance:

- I believe that all incidents are preventable.
- I believe that Zero Incident Performance is achievable through proper planning, tasking, and execution of plans and procedures as written.
- I believe that the investigation of "near misses" provides an opportunity for improvement before a loss occurs.
- I will make every effort to understand how to properly perform each task that I am assigned.
- I will perform each task in a safe and environmentally protective manner with the appropriate level of quality.
- I will help to fix things that are wrong.
- I will immediately report all incidents including "near misses" to my supervisor.

TETRA TECH EC, INC.

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Attachment D

Corporate Procedures Referenced in APP

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EHS 1-4 : Subcontractor Selection and Management

Last Revision By: Kennedy Lugo on 01/14/2011
Created By: Lisa Kaminski on 01/04/2011

Purpose:	The purpose of this procedure is to provide criteria and instruction for the selection and management of Tetra Tech EC, Inc. (TtEC) subcontractors and Teaming Partners to prevent or minimize environmental, health, and safety losses from subcontractor activities.		
Version Date:	01/04/2011 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	Field Activities/Environmental H&S, Field Activities/Environmental H&S, EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents
See Below

1.0 PURPOSE

The purpose of this procedure is to provide criteria and instruction for the selection and management of Tetra Tech EC, Inc. (TtEC) subcontractors and Teaming Partners to prevent or minimize environmental, health, and safety losses from subcontractor activities.

2.0 SCOPE

This program applies to all TtEC subcontractors and lower tiered subcontractors who perform high loss potential (HIPO) fieldwork or who are selected or contracted by TtEC to manage, transport or dispose of waste. For work occurring outside of the United States, see the Health and Safety Policy for U.S. Based Employees Working in Foreign Countries.

Clients who select and contract directly with a waste management subcontractor where TtEC is not involved are not subject to this procedure.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

Program and Project Managers shall ensure that this procedure is implemented. They shall identify on the Purchase Requisition if the subcontractor^{GC} being solicited is performing HIPO work or involves waste management, thus invoking this procedure.

3.1.2 Environmental, Health and Safety Personnel

The PESM or designee shall perform reviews and approve subcontractor and waste management reviews, including conditional approvals of waivers.

3.1.3 Procurement

Procurement shall ensure that procurement packages contain the appropriate attachments from this procedure and that reviews and approvals per this procedure are obtained prior to contract award. Procurement shall also ensure that copies of the subcontractor EHS prequalification packages and approvals are maintained in the contract file.

3.1.4 Subcontractors and Lower Tier Subcontractors

When lower tier subcontractors are used, TtEC Subcontractors shall provide the requirements of[RG] this procedure to the lower tier subcontractor and either certify that lower tier subcontractors also meet these criteria, or obtain TtEC's express, written waiver approval by the responsible Vice President and PESM.

3.2 HIPO Subcontractors

Subcontractors performing HIPO Field Work shall be identified by the Program or Project Manager.

3.2.1 Special Provisions

All TtEC subcontracts for which HIPO field work is performed shall contain the conditions found in Attachment A - Special Provisions - Environmental, Health and Safety Programs, also posted in Tetra Linx, the automated procurement software. Legal and the applicable Vice President shall approve any modification to Attachment A. Procurement shall ensure inclusion of Attachment A in relevant subcontracts.

3.2.2 Notification

The following information shall be provided as applicable by the Project Manager, or designee, to the procurement agent for inclusion in applicable subcontractor Requests for Proposals.

a. Description of site characteristics, contaminants and anticipated health and safety hazards.

b. Copy of the EHS Plan(s), when available,

c. Client EHS requirements, if applicable,

d. Training, certification, and/or medical requirements,

e. Identification of specific EHS laws and regulations, if the work is covered by special OSHA regulations such as asbestos, lead, or process safety management, and

f. Significant site - or project-specific EHS requirements that may impact budget estimation or bid amounts.

Prospective subcontractors will be required to submit information on their EHS program to TtEC as part of the TtEC Subcontractor Profile (Attachment B) if the information is more than one year old, or at the discretion of the PESM.

3.2.3 Evaluation and Approval

The Director, EHS Services, PESM, or designee shall evaluate the subcontractor using the criteria specified in the Field Subcontractor Profile Review Form, EHS Program Areas (Attachment C). Approval shall be documented using the Subcontractor Profile Evaluation Form, EHS Program Areas (Attachment D).

Subcontractor approvals are granted on an annual basis or a conditional basis. Annual evaluations may be waived IF the subcontractor has been continuously on a project site AND inclusion in weekly EHS inspections

per EHS 3-3, EHS Inspections, has been documented. Annual updates to existing subcontractor evaluations may be limited solely to a review of loss data within the past 12 months.

Any exceptions to TtEC Special Provisions (Attachment A) shall be approved by legal and/or the responsible Vice President. Subcontractors that do not meet the following criteria may only be used if conditionally approved by the Vice President responsible for the project and the PESM.

a. EMR of one or less

b. OSHA recordable incident rates, lost workday rates, and lost time case rates that are consistent with or less than the average rates for the industry classification.

c. No OSHA citations or environmental compliance violations in the last five years

Subcontractors using lower tier subcontractors to perform HIPO field work shall be required to certify that their subcontractors have been selected using an equivalent qualification process and that they meet TtEC's criteria for EMRs, incident rates and OSHA and environmental violations or seek waiver (See Section 3.1.4).

3.2.4 On-Site Implementation

All subcontractors are required to follow TtEC EHS policies, procedures, and work rules as specified in the TtEC contract standard Terms and Conditions, Job Site Conditions and Job Site Regulations.

3.2.5 Inspections and Audits

Subcontractor operations shall be included in regular site inspections per EHS 3-3, Inspections, and may be included in other EHS Audits.

3.2.6 Post-Project Review

At the end of each project, the Procurement Agent will coordinate with the Project Manager to ensure that subcontractor EHS performance is documented on the Vendor Performance Evaluation System Form.

3.3 Waste Management Subcontractors

3.3.1 Notification

In order to prequalify to perform work for TtEC, the prospective subcontractors shall submit information on the environmental compliance history by completing the Waste Management Subcontractor Qualifications and Data Questionnaire (Attachment E). Procurement will evaluate past performance from a business perspective and EHS will evaluate past performance from a technical perspective.

3.3.2 Evaluation and Approval

The PESM or designee shall perform a desk audit to determine the environmental compliance status of the subcontractor. The desk audit will include agency interviews, review of permit documentation, as applicable, verification of technical capabilities, submittal of FOIA requests, and confirmation of compliance with USEPA's CERCLA Off-Site Rule. The PESM or designee shall complete the Waste Management Subcontractor Review Form (Attachment F).

Subcontractors who select or contract with lower tier waste management subcontractors shall comply with the same evaluation process and submit completed information to the PESM or designee for review and approval.

3.3.3 Approval Updates

Updates of the environmental compliance status of waste management and transporter subcontractors shall be conducted as follows:

1. Wastes from CERCLA/Superfund Sites. For wastes which contain CERCLA hazardous substances, the

EPA Off-Site Coordinator shall be contacted for each new project to confirm the facility's Off-Site Rule compliance, prior to initiating shipment of each new waste stream, or if more than 6 months has passed from the approval date for waste streams with prior approval. The Waste Management Subcontractor Review Form (Attachment F) shall be revised to document this review.

2. Waste from Non-CERCLA Sites and Transporters. Each subcontractor shall be reviewed at least every 12 months. The Manager, EHS Services, assigned PESM or designee shall revise/update the Waste Management Subcontractor Form and have it reviewed and approved by the Manager, EHS Services.

3.4 Records

Records subcontractor approval or disapproval status shall be maintained by the Director, EHS Services pursuant to TtEC procedure EHS 1-9, Recordkeeping. Procurement shall maintain files regarding approval status.

3.5 Client-Specified Waste Management Subcontractors

When a client directs TtEC to contract and use a waste management or transporter subcontractor that has not been pre-qualified by TtEC, the Project Manager shall obtain[RG] written documentation, acceptable to the Legal Department directing TtEC to use the subcontractor. The evaluation of the subcontractor's environmental compliance status, contract, financial, insurance, and business factors shall be conducted. This documentation shall be maintained in the procurement file.

3.6 Inspection and Audits

On-site audits of waste management facilities shall be conducted on a case-by-case basis. Transporters shall be subject to on-site vehicle inspections upon arrival at the site.

3.7 Training

Procurement shall ensure that all Procurement Department personnel understand the requirements of this program. Operation's Management shall ensure that Line Managers understand the requirements of this program. ESQ Management shall ensure that appropriate ESQ staff understand the requirements of this program.

4.0 GUIDELINES

4.1 Definitions

4.1.1 High Loss Potential (HIPO) Field Work

This section shall contain optional guidance information to successfully execute the procedure or guideline.

HIPO Field Work is field work covered by 29 CFR 1910.120, field construction activities, and other activities as identified by the Program or Project Manager based on information in the TIP.

Defining HIPO work often requires an evaluation. The Program or Project Manager can obtain assistance in evaluating and determining if an activity is HIPO by contacting their PESM, ESS, Site Managers, Superintendents, or other Construction and Safety Professionals. While activities such as fence installation, grounds maintenance, site grading, paving, concrete work, surveying, utility locates, sampling, and shallow excavations may initially appear as low incident potential work.several factors need to be considered before making a final determination. Evaluation criteria should include:

a. location where the work is performed and the existing hazards associated with the site; for instance, digging a 2-foot trench in an undeveloped area vs. digging a 2-foot trench next to the drydock of an active Shipyard pose different hazards.

b. terrain where the work is being performed, including slopes, grades, and soil conditions; for instance, paving a parking lot versus paving an access road up a steep hillside to access a wind generation site.

c. potential for encountering underground utilities or other buried hazards such as ordnance and munitions; for instance, installing a fence around a flat construction site vs. installing a fence around a former bombing range.

d. the inherent dangers or risks associated with the types of subcontractors performing the work; if the proposed subcontractors in your work area have a history of poor safety performance, you may want to invoke EHS 1-4 to help you screen out these contractors or better identify their weaknesses, helping you better plan for the work.

e. client requirements may restrict subcontractors with poor safety records from working on their site, therefore, EHS 1-4 should be followed to determine the safety performance of potential subcontractors.

Note: OSHA also identifies subcontractors that warrant additional prequalification evaluation. The OSHA criteria used for Voluntary Protection Program evaluation is - any subcontractor working more than 1,000 hours in any quarter.

Examples of Non-HIPO Work Generally Include:

f. Landscaping (without use of heavy equipment)

g. Concrete Flatwork (on grade)

h. Minor equipment servicing and repairs

i. Interior painting

Examples of Work That is Typically Considered HIPO Include:

j. Mass Concrete, Concrete Walls and Suspended Slabs

k. Site Grading

l. Clearing & Grubbing, Chain Saw Work

m. Demolition

n. Critical Lifts, Work Involving Cranes

o. Work around energized electrical lines

p. Piping hot taps

q. Structural steel erection

r. Roofing & siding installation

s. Drilling

t. Explosives handling

u. UXO work

v. Electrical

w. Lock out tagout/line breaking

x. Confined space entry

y. Welding or torch cutting

4.1.2 Procurement

Procurement refers to the functional elements of the Procurement and Contracting Department directly reporting to the Vice-President, Project Management Services.

4.1.3 Subcontractor

A subcontractor is a person or business entity who signs a subcontract, (or purchase order, master ordering agreement, task order, etc.) to perform work for TtEC, the prime contractor. A subcontractor may also be called seller, vendor, or contractor.

4.1.4 Waste

Waste is defined as any material to be disposed, discharged, or recycled, including hazardous and non-hazardous (e.g., soil, groundwater, decon fluids, PPE, disposable equipment, laboratory wastes from on-site testing, used oil, scrap metal, debris, and wastewater). Non-hazardous waste under this procedure does not include office or trailer waste, sanitary waste, non-contaminated excavation soils intended for reuse, or recycled office or trailer waste such as paper and printer cartridges.

4.1.5 Waste Management Subcontractor

A subcontractor who performs waste transportation and treatment, storage, disposal, recycling, wastewater treatment, or operates other waste management facilities.

4.2 Waste Management Subcontractor General Guidelines

Waste management subcontractors holding Master Ordering Agreements are the preferred companies for waste management services. Other waste management subcontractors may be approved on a case-by-case basis using approved qualification criteria. Whenever feasible, the waste management subcontractor should provide waste characterization, transportation and disposal services so that the entire waste management process is under the control of one responsible party.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link In This Column
1. C-2, Audits	
2. EHS 1-9, Recordkeeping	
3. EHS 3-2, Procedures - Environmental, Health & Safety Plans	
4. EHS 3-3, Inspections	
5. OSHA (U.S. Department of Labor, Occupational Safety & Health Administration), OSHA CSP 03-01-002 - TED 8.4 - Voluntary Protection Programs (VPP): Policies and Procedures Manual	
6. PO-2, Task Initiation (TIP)	
7. TtEC Policy - Health and Safety Policy for U.S. Based Employees	

Working in Foreign Countries	
8.	
9.	

6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Special Provisions - Environmental, Health and Safety Programs	EHS 1-4 Attachment A 12-10.doc
B. Subcontractor Profile - EHS Program Areas	EHS 1-4 Attachment B 12-31-10.doc
C. Subcontractor Profile Evaluation Criteria - EHS Program Areas	EHS 1-4 Attachment C.12-10.doc
D. Field Subcontractor Profile Review Form - EHS Program Areas	EHS 1-4 Attachment D-12-10.doc
E. Waste Management Subcontractor Qualifications and Data Questionnaire	EHS 1-4, Attachment E, 12-10.doc
F. Waste Management Subcontractor Review Form	EHS 1-4, Attachment F, 12-10.doc

EHS 1-4 ATTACHMENT A

TETRA TECH EC, INC.

SPECIAL PROVISIONS – ENVIRONMENTAL HEALTH AND SAFETY PROGRAMS

Subcontractor	Subcontract No.

Subcontractor hereby agrees to:

1. Comply with all federal, state, and local laws and regulations as well as all site rules and plans adopted by Tetra Tech EC, Inc. (TtEC) and its clients, pertaining to safety and health, pollution control, water supply, fire protection, sanitation facilities, waste disposal, emergency response notification and other related items.

2. Require their Site Manager to be available for all health and safety (HS) meetings.

3. Provide training and certification of training for all of their employees to perform site work safely and in accordance with OSHA and other applicable regulations and site procedures. Training for employees working on hazardous waste sites will meet the requirements of 29 CFR 1910.120, including initial, on-the-job, refresher, and supervisor training, as necessary. Training for employees who perform hazardous materials functions related to transportation must meet the requirements of 49 CFR 172, Subpart G, and employees who manage or otherwise handle hazardous waste will meet 40 CFR 264.16 or 265.16 training requirements. The PESM will determine the adequacy of subcontractor training programs, if required.

4. Provide or arrange for adequate first-aid facilities, persons qualified in first aid, and emergency transportation services. The SM shall be determine the adequacy of these arrangements and facilities.

5. Ensure that employees working on hazardous waste sites and other regulated areas are medically qualified and certified by a physician as capable of wearing personal protective equipment.

6. Report all site incidents that result in, or could have resulted in employee injury or illness, fire, explosion, spill, environmental release, permit exceedence or property damage immediately to the TtEC site representative. Such incidents will be investigated by the subcontractor to determine the causes and corrective actions. Copies of the investigation reports will be provided to TtEC and maintained on site.

7. Comply with the requirements of the TtEC Environmental Health and Safety (EHS) Plan(s) for the site work or develop and implement a Site EHS Plan in accordance with TtEC requirements.

8. Practice good housekeeping at all times. Waste, debris, and garbage shall be removed daily or placed in appropriate waste containers. All materials, tools, and equipment shall be stored in a safe, orderly and environmentally compliant fashion.

9. Provide appropriate personal protective equipment and training to employees in its selection, use, maintenance and care. Personal protective equipment will be used when required by regulation or site rules. All personal protective equipment shall meet appropriate ANSI or NIOSH standards.

10. Cooperate fully with all other site subcontractors in their respective EHS programs.

11. Furnish all information concerning safety of its operations on the project as required by the TtEC Project Manager.

12. Implement hazardous work procedures for hot work, confined space entry, lockout/tagout, line breaking and excavations that are at least as effective as TtEC's. Subcontractor shall comply with all TtEC hazardous work permit requirements. The PESM will determine the effectiveness of the subcontractor's program.

13. Conduct no site work unless a TtEC representative is present or prior approval is obtained.

14. Address all deficiencies noted by TtEC and its client related to health, safety and environmental compliance.

15. Cooperate fully with any TtEC or regulatory agency inspections or audits. Immediately notify TtEC regarding the nature and scope of any inspection, and update TtEC on inspection activities each day. Copies of all notices, citations and inspection reports will be provided to TtEC.

16. Ensure lower tier subcontractors and waste management transporters, disposal, management, and treatment facilities, are selected and managed to prevent EHS losses from those activities.

Qualifications for Lower-Tier Subcontractors: Subcontractor is responsible for Environmental Health and Safety qualification of lower-tier subcontractors who will be performing field services covered under 29 CFR 1910.120, or construction services. Onsite lower-tier subcontractors must have an EMR of 1 or less, and OSHA recordable incidence rates, lost workday rates and lost time case rates, that are consistent with or less than the average rates for the industry classification. Additionally, lower-tier subcontractors should not have any OSHA citations or environmental compliance violations in the past 5 years. In the event that the lower-tier subcontractors selected by Subcontractor do have either OSHA citations or environmental compliance violations in the past five years, or an EMR or incident rates that exceed the criteria, Subcontractor must specifically bring such information to TtEC's attention and seek TtEC's express, written waiver of such requirements prior to the award of the subcontract. This information shall be submitted to TtEC prior to, and as a condition of, award of the subcontract. Such waiver does not create an approval of the lower-tier subcontractor by TtEC, nor does it change the subcontractors complete responsibility for the lower-tier subcontractor's performance.

The following lower tier subcontractor, _____, does not meet the requirements in the area of _____; applicable documentation is attached.

TETRA TECH EC, INC.

Subcontractor Profile - Environmental Health and Safety Program Areas

Company Name:	***Primary SIC Code(s):***
Project Name/Location:	***Primary NAICS Code(s):***

Loss History **COMPANIES PROVIDING ANNUAL UPDATE ONLY USE ONLY SHADED AREAS ON THIS FORM**	**Current Year**	**Last Year**	**Previous Year**	**Previous Year**
1. Experience Modification Rate ***(Attach verification – see Page 2)***				
2. Total Employee Hours Worked by Calendar Year				
3. Total Number of Recordable Injuries and Illnesses ***(OSHA 300 - Columns G+H+I+J)*** ***(Attach OSHA 300 form for each year listed)***				
4. Total Recordable Incidence Rates [(Row 3 x 200,000) / Row 2] (See Page 2)				
5. Number of Cases that Involved Days Away From Work (OSHA 300 - Column H)				
6. Days Away Incidence Rates [Row 5 x 200,000 / Row 2] (See Page 2)				
7. Number of cases, Remained at Work, but Transferred or Restricted (OSHA 300 - Column I)				
8. DART Incidence Rate [(Row 5 + Row 7) x 200,000 / Row 2] (See Page 2)				
Total Number of Fatalities (Column G on OSHA 300) (See Page 2)				

OSHA Form 300 Record Keeping:		
• Have you employed more than 10 employees during the last 3 years?	☐ Yes	☐ No
• If yes, have you maintained OSHA 300 Forms as required by Federal Law?	☐ Yes	☐ No

.

Subcontractor Profile - Environmental Health and Safety Program Areas

Required EMR Documentation:

Experience Modification Rates:

This may be in the form of a memo on worker compensation insurance provider's letterhead, NCCI certificate, or other appropriate document.

EMR Corrective Action Plan:

If any EMR rate listed is greater than 1.0, you must attach a Corrective Action Plan. The Corrective Action Plan must explain why the EMR(s) are greater than 1.0, and descriptions of the corrective action(s) that have been implemented to reduce the EMR to 1.0 or less.

Incidence Rates:

The incidence rates that you insert into the table on Page 1 will be compared to the U.S. Bureau of Labor Statistics tabulated Incidence Rates for the most recent year available. The Incidence Rates used will be that of the NAICS Code which most closely represents the nature of the work to be performed by your firm on the subject project.

If any Incidence Rate listed in the table on Page 1 is greater than the appropriate National Average, you must attach a Corrective Action Plan. The Corrective Action Plan must explain in detail why the Incidence Rates are above the National Averages, as well as descriptions of the corrective action(s) that have been implemented to reduce the Incidence Rates, and a demonstration of the effectiveness of the corrective actions to date.

Fatalities:

If any fatalities are indicated on the table on Page 1, then a detailed explanation of the fatality must be provided. In addition, you must attach a Corrective Action Plan. The Corrective Action Plan must contain detailed descriptions of the corrective action(s) that have been implemented to prevent recurrence of similar incidents in the future, and a demonstration of the effectiveness of the corrective actions to date.

Subcontractor Profile - Environmental Health and Safety Program Areas

Substance Abuse Programs

Does your company have a substance abuse program which includes pre-employment, "for cause", and post accident employee drug and alcohol testing?	☐ Yes	☐ No
If not, will you implement a program for work subcontracted to your company?	☐ Yes	☐ No
Does your company have a program in place that complies with the Federal Drug-Free Workplace Act?	☐ Yes	☐ No
If not, will you implement a Drug-Free Workplace Program that complies with Federal requirements (DFAR Clause 252.223-7004) for work subcontracted to your company?	☐ Yes	☐ No

Environmental Health and Safety Program Elements **(check all that apply)**

Written Health and Safety Programs *(Attach a listing of the written programs or a copy of the table of contents for the programs)*	☐ Management Commitment and Policy regarding health and safety ☐ Company Health and Safety Program Manual ☐ Safe Operating Procedures for high hazard operations ☐ Written Respiratory Protection Program ☐ Written Hearing Conservation Program ☐ Written Hazard Communication Program ☐ Written Bloodborne Pathogen Program ☐ Written Medical Surveillance Program ☐ Written Lockout/Tagout procedures ☐ Written Confined Space Entry procedures
Worksite Evaluation and Analysis	☐ Formalized methods to identify and control high hazard operations ☐ Job or Task Hazard Analysis developed for hazardous operations ☐ Formalized accident/incident reporting and investigation process ☐ Documented "lessons learned" program
Safety Committees and Meetings	☐ Active company or organization health and safety committee ☐ Active site health and safety committee ☐ Employee and labor inclusion in site committee ☐ Daily "toolbox" site safety meeting requirement ☐ Weekly site safety meeting requirement ☐ Monthly site safety meeting requirement ☐ All employees required to attend site safety meetings ☐ Subcontractors required to attend safety meetings
Environmental Health and Safety Inspections/Audits	☐ Line management participation in site EHS inspections/audits Frequency_____ ☐ EHS specialist participation in site EHS inspections Frequency_____ ☐ Requirement for independent audits of site EHS program By whom?_____ ☐ Written documentation of EHS inspection/audit findings ☐ Written documentation of EHS inspection/audit corrective actions
Environmental Health and Safety Training and Awareness Programs	☐ Safety training and orientation for new hires ☐ Safety training and orientation for line management ☐ Safety training and orientation for site supervisors/foremen ☐ Safety training and orientation for subcontractors ☐ Periodic employee/supervisor safety training ☐ DOT Hazardous Materials (49 CFR 772, Subpart G)trained workers ☐ Hazardous Waste (29 CFR 1910.120) trained workers ☐ RCRA facility (40 CFR 264.16 or 265.16) trained workers
Environmental Programs	☐ Policy statement for environmental compliance or management ☐ Written program for environmental compliance or management ☐ Procedures for prevention and reporting of spills or releases ☐ Procedures for reporting permit exceedences ☐ Procedures for review/approval of waste management and/or transporter vendors or subcontractors

TETRA TECH EC, INC.

Subcontractor Profile - Environmental Health and Safety Program Areas

Environmental Health and Safety Compliance History

The following compliance questions relate to your company and operations over the past 5-year period. The term company is inclusive of all operations nationwide, all associated subsidiaries, companies and operating divisions and all company names currently and previously used. (Tetra Tech will check various available databases to verify the information provided on this form).

Has OSHA (Federal or State) issued any citation(s) to your company?	☐ Yes	☐ No
Has OSHA (Federal or State) issued any citation(s) to subcontractors working on projects or sites managed by your company?	☐ Yes	☐ No
Are there any past or pending Environmental Enforcement Actions or environmental compliance violations for your company?	☐ Yes	☐ No
For projects, subcontractors, or sites managed or operated by your company, are there any past or pending Environmental Enforcement Actions or Environmental Compliance Violations for any other related organization? (*Note: Related organizations would include subcontractors, site owners, other companies, subsidiaries, or government organizations. This question is limited to the time period when your company was in management or operational control of the project or site.)*	☐ Yes	☐ No

If yes to any question above, attach a copy of the Violation, Citation, or Enforcement Action; provide a description, including an explanation of the circumstances and resolution(s) with the agency. Please provide a discussion of what corrective action(s) have been implemented to prevent recurrence, and a discussion of the effectiveness of these corrective actions to date.

I certify that the foregoing environmental health and safety compliance history is true and correct, and that I am a duly authorized representative of the company.

Printed Name	Title
Signature	Date

Company contact for additional health, safety and environmental program information:

Printed Name	Title
Phone Number	Fax Number

Summary of Required Documentation and Submittals:

- Insurance provider documentation of EMR for current and past three years.
- OSHA 300 Forms for current and past three years.
- Description/Explanation and Corrective Action Plan(s) If any of the following are true; EMR(s) greater than 1.0, Incidence Rate(s) above National Average, previous fatality.
- Table of contents from Health and Safety and/or Environmental Compliance Program Manual(s). (Tetra Tech reserves the right to request a copy of the entire document)
- In the event of a previous OSHA citation or Environmental Enforcement Action, a description of the circumstances of the violation, and a Corrective Action Plan which describes measures taken to prevent recurrence of the condition/action which resulted in the citation/enforcement action.
- Documentation of a Substance Abuse Program which includes pre-employment, “for cause”, and post-accident drug and alcohol testing, and a Drug-Free Workplace Program which complies with Federal requirements (DFAR Clause 252.223-7004). Proof of negative drug screen results will also be required for each employee who will be working on the project site before the commencement of site work.

TETRA TECH EC, INC.
SUBCONTRACTOR PROFILE EVALUATION CRITERIA
ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

Six environmental health and safety (EHS) program areas are evaluated to initially qualify a subcontractor to perform work for Tetra Tech EC, Inc. EHS information provided on the Subcontractor Profile is used as the basis of the evaluation.

1. Loss History

Each Experience Modification Rates (EMR) listed must be substantiated with a letter from the subcontractor's insurance carrier or a letter from the subcontractor stating why an EMR is not established. Both the average of the EMR listed **and** the most recent EMR should be less than or equal to 1.0. For years where an EMR is not established, the EMR is assumed to be 1.0.

Three injury/illness incidence rates (total recordable, lost workday, and lost time) will be compared to the Bureau of Labor Statistics national averages for the NAICS/SIC code most appropriate to work the subcontractor is anticipated to perform Subcontractor incidence rates in the current and previous 3 years must be below the national averages for each of the three incidence rate categories. Incidence rates listed must be substantiated be OSHA 300 forms for the subcontractor unless they are exempt from the form requirement. Smaller companies (less than 200,000 workhours/year) may be prequalified by the ESQ support staff member at higher rates if the total number of cases over the time period are judged reasonable. Prequalification of a subcontractor with high loss averages (EMR >1 or incidence rates above the industry averages) requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

2. Substance Abuse Programs

The subcontractor must state whether or not they have a substance abuse program in place which meets the requirements of the federal Drug Free Workplace Act **and** if it includes a provision for post incident employee drug and alcohol testing. Subcontractors who do not have a program in-place but are willing to implement the required substance abuse program, may be given conditional prequalification. Subcontractors with conditional approval will be required by subcontract to have a substance abuse program in-place prior to the start of work.

3. Environmental Health and Safety Program Elements

The supporting EHS staff member will make a qualitative assessment of the subcontractor environmental health and safety program. The assessment will be made on the basis of the information provided on the Subcontractor Profile form, and compared to the type of work the company is reasonably anticipated to perform. A program that appears developed and contains elements such as company ESQ policy, written procedures, worksite inspections, employee training and awareness, and similar items is considered acceptable. A program that appears to be undeveloped and does not contain the basic elements necessary for completing work in a safe and compliant manner is considered unacceptable.

4. OSHA Compliance History

The subcontractor should have zero OSHA citations in the past 5 years. Prequalification of a subcontractor with OSHA citation(s) requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

EHS 1-4 ATTACHMENT C

SUBCONTRACTOR PROFILE EVALUATION CRITERIA
ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

5. Environmental Compliance History

The subcontractor should not have any past or pending environmental enforcement actions or violations in the past five years. This includes the subcontractor, lower tier subcontractors, and sites or projects that are or have been managed by the subcontractor. Prequalification of a subcontractor with environmental enforcement actions or violations requires an acceptable corrective action plan **and** approval of the appropriate VP and EHS support staff member.

6. Previous Performance

Poor EHS performance on previous projects may disqualify a subcontractor from further consideration. Information on previous performance will be checked by the procurement group in the TtEC Vendor Database and through reference checks with other companies or personnel during the prequalification process. Previous performers who received an unsatisfactory EHS reference will not be qualified without an acceptable explanation and corrective action plan if necessary.

Qualification Based on Additional Information

A subcontractor who does not qualify for subcontract work due to the evaluation of their EHS program or performance will be notified of the reason(s). If possible, the subcontractor will be offered an opportunity to submit additional qualifying information. The additional information may include an explanation of extenuating circumstances, additional programs or procedures instituted by the company to reduce risk, or other environmental health and safety initiatives with demonstrated effectiveness.

EHS 1-4 ATTACHMENT D

TETRA TECH EC, INC.

FIELD SUBCONTRACTOR PROFILE REVIEW FORM
ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AREAS

Environmental Health and Safety program information supplied by the named subcontractor was reviewed. The results and subcontractor status are summarized below.

Subcontractor Name:	**Project Name/Location:**
Address:	
City, State, Zip Code:	
Contact:	**Telephone No.:**

Subcontractor Status:	**Comments:**
☐ Prequalified	
☐ Not Prequalified	
☐ Conditional Prequalification	
☐ Incomplete Information to Prequalify	
☐ Other:	

Prequalification Review Summary

Loss History	**M**	**DNM**	**C**	**I**	**Remarks:**
Experience Modification Rating					
Incidence Rates					

Substance Abuse Programs	**M**	**DNM**	**C**	**I**	**Remarks:**
Substance Abuse					
Drug Free Workplace					

Env. Health and Safety Program	**M**	**DNM**	**C**	**I**	**Remarks:**
Written Programs					
Training Programs					

OSHA Compliance History	**M**	**DNM**	**C**	**I**	**Remarks:**
Company Citations					
Subcontractor Citations					

Env. Compliance History	**M**	**DNM**	**C**	**I**	**Remarks:**
Company					
Projects/Sites Managed					

EHS Review:	_____	_____	_____
	Printed Name	**Signature**	**Date**

VP Approval:	_____	_____	_____
(if applicable)	**Printed Name**	**Signature**	**Date**

M - Meets criteria **DNM** - Does not meet criteria **C** - Conditional **I** – Incomplete information

EHS 1-4, ATTACHMENT E

WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE

Company Name:		Parent Company:	
Address:		EPA ID No (RCRA*):	
		EPA ID No (TSCA)	
City/State/Zip:		Transporter ID No (s):	
Contact:		DOT & MC No(s):	
Phone:	( )	Motor Carrier Safety Rating:	
Previous Name/Owners of Facility:		State Permit No(s):	
Solicitation or Subcontract No.		** For Transporters, please provide EPA Id No. for each state in which you propose transport in or through or attach list.*	

1. LIST SERVICE CAPABILITIES:

	Treat	Store	Recycle	Dispose	Transport	N/A
Hazardous Waste (Federal/State) *						
Radioactive Waste						
Mixed Waste						
TSCA-PCBs *						
>50 ppm (liquid or solid)						
50> 500 ppm (liquid or solid)						
> 500 ppm (liquid or solid)						
PCBs < 50 ppm (maximum concentration is: _____)						
Special Waste						
Solid Waste						
Chemical Surety						
Asbestos						
UXO/OEW						
Debris (Type: _____)						
Waste Oil / Petroleum						
Carbon Regeneration						
Batteries						
Fuel Blending						
Solvents						
Soils						
Scrap Metal						
Universal Waste:						
Other:						

Other:	Yes	No	Transporter Mode:	Yes	No
Waste Water Treatment			Highway		
Transfer Station			Air		
Temporary Storage			Rail		
Bulking			Vessel		
Lab Packing					

*List applicable waste code / or attach appropriate documentation

WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE

2. LIST WASTE MATERIALS THAT CAN BE ACCEPTED AT YOUR FACILITY:

Physical Characteristics	Yes	No	Packaging Requirements	Yes	No
a. liquids			a. liquids - bulk loads		
b. solids			b. solids - bulk loads		
c. sludges			c. liquids - drummed		
d. debris			d. solids - drummed		
e. gases			e. rail access		
f. multi-layered					

3. IDENTIFY OTHER SERVICES OR CAPABILITIES YOUR FIRM IS CAPABLE OF PROVIDING. IF NECESSARY, ATTACH ADDITIONAL SHEETS, BROCHURES, DOCUMENTS.

4. LIST AND PROVIDE INFORMATION REGARDING ANY TECHNOLOGIES USED AT YOUR FIRM, INCLUDING INFORMATION ON PATENTS. IF NECESSARY, ATTACH ADDITIONAL SHEETS, BROCHURES, DOCUMENTS.

5. LIST AND PROVIDE COPIES OF ALL FEDERAL, STATE, AND LOCAL PERMITS, LICENSES, AND AUTHORIZATIONS OR REQUESTS FOR RENEWAL THAT ALLOW YOU TO PROVIDE YOUR SERVICES (full copies are not required, provide only the front and/or certification page).

Permit	Permit Number	Issuing Agency/Contact Name

6. IS THE FACILITY APPROVED TO ACCEPT CERCLA WASTES UNDER THE OFF-SITE RULE? ☐ Yes ☐ No

If yes, date of last approval: _____

***Waste types*:**

WASTE MANAGEMENT QUALIFICATIONS AND DATA QUESTIONNAIRE

7. LIST REGULATORY AGENCY CONTACTS MOST FAMILIAR WITH FACILITY OPERATIONS AND REGULATORY COMPLIANCE HISTORY (e.g., facility inspectors, permit writers, etc.).

Name	*Agency*	*Phone Number*

8. LIST THE AGENCY, INSPECTOR'S NAME, DATE, AND RESULTS OF THE LAST AUDIT/INSPECTION BY A REGULATORY AGENCY.

9. LIST AND THEN SUBMIT COPIES OF ALL NOTICES OF VIOLATION, PAST AND PRESENT PENDING AND ACTUAL ADMINISTRATIVE, CIVIL AND/OR CRIMINAL ENFORCEMENT ACTIONS, FOR ALL LOCAL, STATE AND FEDERAL AGENCIES OVER THE PAST FIVE YEARS. PROVIDE DESCRIPTIONS OF ACTIONS TAKEN IN RESPONSE.

10. ARE THERE ANY PRESENT/HISTORICAL KNOWN RELEASES FROM THE FACILITY OR KNOWLEDGE OF GROUNDWATER CONTAMINATION? ☐ Yes ☐ No

If yes, provide list of historical spill/release records and corrective actions taken at facility. Provide status of any cleanup initiatives and agency name, contact person, and phone number.

11. PROVIDE A COPY OF THE TABLE OF CONTENTS FOR YOUR DOT AND RCRA TRAINING PROGRAMS. ⇒

12. PROVIDE TABLE OF CONTENTS FOR YOUR ENVIRONMENTAL COMPLIANCE PROGRAM ⇒

13. TRANSPORTATION SERVICES:

a. List USDOT and State Motor Carrier, EPA/State RCRA, TSCA and Solid Waste Violations for past two years.

b. List Motor Carrier Rating: USDOT _____ State _____

c. If rating is other than "Satisfactory" OR if accident, vehicle out-of-service rates, or driver out-of-service rates are above national average, provide copies of USDOT/State Inspection Vehicle Records for past two years.

14. PROVIDE COPIES OF PLANS FOR SPILLS AND RELEASES, TRANSPORTATION PROBLEMS (INCLUDING INTERIM STORAGE CAPABILITY) AND ARRANGEMENTS IN PLACE FOR EMERGENCY RESPONSE SUPPORT DURING TRANSPORT.

15. LIST ANY INTENDED SUBCONTRACTORS.

_____

16. TRANSPORTERS: PROVIDE TABLE OF CONTENTS FOR DOT HM SECURITY PLAN. IF NOT REQUIRED TO HAVE A SECURITY PLAN, SUBMIT STATEMENT GIVING REASONS FOR NOT HAVING SUCH A PLAN (e.g., do not transport DOT Hazardous Materials subject to the requirements for a Security Plan).

_____

_____

17. TRANSPORTERS: PROVIDE A COPY OF DOT HM SAFETY PERMIT IF TRANSPORTING ANY OF THE FOLLOWING HM:

- Radioactive materials – a highway route controlled quantity of Class 7 materials.
- Explosives – more than 55 lbs. of a Division 1.1, 1.2 or 1.3 material; or an amount of Division 1.5 requiring a placard.
- Toxic-by-inhalation – Division 2.3 and 6.1 – specific quantities per hazard zone.
- Liquefied natural gas – in bulk packages of capacity $\geq$ 3,500 gallons of liquid methane or natural gas; or other liquefied gas with $\geq$ 85% methane.

☐ **N/A (Do not transport any HM that requires a DOT Safety Permit).**

EHS 1-4, ATTACHMENT F

TETRA TECH EC, INC.

WASTE MANAGEMENT SUBCONTRACTOR REVIEW FORM

APPROVAL		
Approved: ☐	**Conditionally Approved:** ☐	**Declined:** ☐
PESM or Designee Signature:		**Date:**
Manager, EHS Services Signature:		**Date:**
Restrictions/Comments:		

I. BACKGROUND INFORMATION:

Company Name:			
Physical Address:			
City/State/Zip:			
Business Address:			
Contact One:		Parent Company:	
Phone:	( )	EPA ID No (RCRA*):	
Contact Two:		EPA ID No (TSCA)	
Phone:	( )	USDOT ID No (s):	
Fax:	( )	Motor Carrier Safety No(s)/ ICC #:	
Previous Name/Owners of Facility:		** For Transporters, please provide EPA ID No. for each state in which you propose transport in or through or attach list.*	

II. TtEC PROJECT INFORMATION:

TtEC Contact:		Project-Specific waste description/codes:	
Project:			
Project Manager:		Waste contains hazardous substance:	☐ Yes ☐ No
Charge Number:		Project is CERCLA site:	☐ Yes ☐ No
Project Location:			
TtEC Subcontract or Solicitation No:			

III. ATTACH VENDOR QUALIFICATION AND DATA QUESTIONNAIRE TO THIS APPROVAL

A completed Vendor Qualification and Data Questionnaire (Attachment E), demonstrating facility's/transporter's service capabilities and waste acceptance criteria should be attached to this approval. This information will be entered into the TtEC National TSDF Database.

IV. HAZARDOUS OR SPECIAL WASTE		Not Applicable: ☐	
EPA Region:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			
State Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

V. TSCA/PCB WASTES		Not Applicable: ☐	
EPA Region:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

VI. SOLID/NON-HAZARDOUS WASTES		Not Applicable: ☐	
State Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

VII. STATE/REGIONAL/LOCAL REQUIREMENTS (Contact Agencies regarding wastewater discharges, air emissions, soil/groundwater contamination, remediation activities and local land use planning approvals, etc.)		Not Applicable: ☐	
Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

VII. STATE/REGIONAL/LOCAL REQUIREMENTS (Continued)			
Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Known Releases:			
Enforcement Status/Comments:			

VIII. TRANSPORTATION		Not Applicable: ☐	
A. USDOT (www.safersys.org)			
USDOT:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Insurance Verified and Up To Date			
DOT Motor Carrier Rating:			
Enforcement Status/Comments:			

B. STATE MOTOR CARRIER			
Agency/Department:		Date Contacted:	
Contact and Title:		Most Recent Inspection Date:	
Phone Number:	( )		
Insurance Verified and Up To Date			
Motor Carrier Rating:			
Enforcement Status/Comments:			

C. DOT HAZARDOUS MATERIALS SECURITY REQUIREMENTS

Is carrier transporting any of the following HM? ☐ **Yes*** ☐ No

- A highway route-controlled quantity of a Class 7 (radioactive) material in a motor vehicle, rail car, or freight container;
- More than 25 kg (55 pounds) of a Division 1.1, 1.2, or 1.3 (explosive) material in a motor vehicle, rail car or freight container;
- More than 1 liter (1.06 quart) per package of a material poisonous by inhalation, that meets the criteria for Hazard Zone A;
- **A shipment of a quantity of HM in a bulk package having a capacity equal to or greater than 3,500 gallons for liquids or gases, or more than 17.3 cubic yards for solids;**
- A shipment in non-bulk packaging of 5,000 pounds total gross weight or more of one class of HM for which placarding of a vehicle, rail car, or freight container is required;
- **A quantity of HM that requires placarding;** or
- A select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR Part 73.

*** If Yes, Carrier is required to have a HM Security Plan:**

☐ Carrier's HM Security Plan Table of Contents was reviewed & satisfactorily addresses the specific security risks associated with the HM being transported.

☐ Carrier's HM Security Plan Table of Contents was reviewed & does **NOT** adequately address the specific security risks associated with the HM being transported.

Comments:

Is carrier transporting any of the following HM? ☐ **Yes*** ☐ No

- Radioactive materials - highway route controlled quantity of Class 7 materials.
- Explosives – more than 55 lbs. of a Division 1.1, 1.2 or 1.3 material or an amount of Division 1.5 requiring a placard.
- Toxic-by-inhalation – Division 2.3 and 6.1 – specific quantities per hazard zone.
- Liquefied natural gas – in bulk packages of capacity ≥ 3,500 gallons of liquid methane or natural gas; or other liquefied gas with ≥ 85% methane.

*** If Yes, Carrier is also required to have a HM Safety Permit:**

☐ Carrier's HM Safety Permit was reviewed & is complete and current.

☐ Carrier's HM Safety Permit was reviewed & is **NOT** complete/current.

☐ Carrier does **NOT** have a HM Safety Permit.

Comments:

IX. CERCLA OFF-SITE STATUS – Complete for all facilities		Not Applicable: ☐ (For transporters only)	
CERCLA Off-Site Coordinator:		Approved to Accept CERCLA waste?	☐ Yes ☐ No
Phone Number:	( )	Date of CERCLA Approval:	
Date Contacted:			
Comments:			

X. TECHNOLOGY – Complete for all facilities			Not Applicable: ☐ (For transporters only)
Is Technology Review Required?	☐ Yes	☐ No	
If Yes, Is Technology Review Completed?	☐ Yes	☐ No	Date Completed:

EHS 1-7 : Event Reporting and Investigation

Last Revision By: Kennedy Lugo on 11/16/2010
Created By: Cindy Leong on 10/07/2009

Purpose:	The purpose of this program is to: (a) specify the types of events to be reported and investigated, including both safety and quality-related events; (b) define internal Tetra Tech EC, Inc.(TtEC) and external event notification requirements; (c) ensure proper management and follow-up of each event; (d) meet regulatory notification and investigation requirements; (e) provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.		
Version Date:	12/09/2009 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Environmental H&S, EHS Compliance/Spill Reporting, Field Activities/Science, Operational Control, Training, EHS Compliance/Permits, Nonconformance and Corrective and Preventive Action	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents

1.0 PURPOSE

The purpose of this program is to:

a. Specify the types of events to be reported and investigated, including both safety and quality-related events.

b. Define internal Tetra Tech EC, Inc. (TtEC) and external event notification requirements.

c. Ensure proper management and follow-up of each event.

d. Meet regulatory notification and investigation requirements.

e. Provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.

2.0 SCOPE

Event reporting requirements apply to all operations of TtEC and its subsidiaries (the "Company"), including subcontractor activities. The term “Event Reports” in this procedure encompasses Quality Event Reports (QERs), Near Miss, and EHS Event Reports.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 All Personnel

All personnel shall immediately report any event (see Section 4.1.1) to their supervisor. The report can be verbal or in writing.

Employees, including subcontractors, are required to participate in the investigation process as directed, and comply with corrective actions identified. Employees are also made aware of trends and may be asked to help develop lessons learned to prevent similar events from occurring.

3.1.2 Line Management

Line Management, including the Office Manager for office events and the Project Manager (PM) for project events shall:

a. Be responsible for all client notifications - (Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures).

b. Implement the appropriate internal notifications (see Table 1) as required by this program as soon as an event becomes known.

c. The supervisor responsible for directly overseeing the work shall ensure completion of the Event Report. The supervisor shall directly participate in the causal analysis investigation.

d. Ensure that corrective actions have been completed and properly documented.

3.1.3 Environmental Safety and Quality Personnel

Environmental Safety and Quality Personnel (Environmental Safety Coordinator, Environmental Safety Specialist, and Project Quality Control personnel) shall:

a. Ensure that all notifications are made promptly.

b. Ensure that all reports are fully completed.

c. Ensure that all insurance and workers compensation forms are completed and submitted as necessary.

d. Participate in event investigations of all Occupational Safety and Health Administration (OSHA) recordable injuries/illnesses, spills, releases, and other investigations.

e. Communicate information about the event to applicable site and/or office employees.

3.1.4 Project Quality Control Manager

The Project Quality Control Manager shall review and approve QER investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The Project Quality Control Manager's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective corrective actions should be elevated to the Director, Quality Programs for further evaluation and potential additional programmatic corrective actions.

3.1.5 Project Environmental and Safety Manager (PESM)

The PESM shall review and approve event investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The PESM's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective correction actions should be elevated to the Director, EHS Services for further evaluation and potential additional programmatic corrective actions.

3.1.6 Director, EHS Services

The Director, EHS Services shall:

a. Notify OSHA of any injuries or illnesses occurring within OSHA jurisdiction as required.

b. Review/maintain log - which includes information on basis causes, immediate causes, and management control issues - of all investigations.

c. Distribute summaries of events with periodic management reports.

d. Communicate significant events to key personnel within the Company.

e. Review basic causes of Company events to identify trends.

f. Recommend EHS program modifications as necessary.

g. Immediately notify the Tetra Tech Health and Safety Manager of any serious accident and provide follow-up information on serious accidents.

h. Provide Monthly Injury Reports to the Tetra Tech Health and Safety Director.

3.2 Notifications

In addition to the reporting responsibilities specified in Section 3.1, the responsible supervisor is required to notify Work Care at 800-455-6155 (available 24 hours) of employee illness or injuries. Work Care's main office must be notified promptly of all injuries and illnesses so the affected employee receives prompt and appropriate medical advice. The call to Work Care must be made in addition to taking the affected employee to the local clinic. EHS 2-1, Emergency Preparedness, provides guidance for medical response and actions.

The responsible supervisor is also required to ensure notifications are made as outlined in Table 1.

The phone numbers and other means of contact for Company personnel shall be posted with the emergency notification list and/or integrated into the site-specific emergency notification list.

3.3 Event Report Generation

The information portion of the Event Report should be generated by the end of the supervisor’s work shift on the day of the event, if possible, but no later than 24 hours after the event was reported by the supervisor and employee(s) involved in the event. The investigation completion time is provided in Section 3.4.

The Event Report and Investigation may be completed electronically in the Company Incident Database located on Lotus Notes or by hardcopy using Attachment A, Event Report and Investigation Form, or Attachment B, Quality Event Report Form. (Attachment C, Event Sketch, may be used to graphically depict **events**).

The forms are intended to be self-explanatory. If the supervisor or the employee has any questions regarding completion of the report, an ESQ representative should be contacted for support.

Both the employee(s) and the employee's supervisor must sign the Event Report.

For low loss-potential near misses, the ZIP Slip may be substituted for the standard Event Report. (See CRL Procedure PP-10, Employee Recognition).

3.4 Event Investigations

Event investigations are to be initiated and completed as soon as possible, but should be completed no later than 10 working days after the event has been reported.

Guidance for conducting investigations and cause analysis may be found in Section 4.3.

Table 1. Internal Notifications By Supervisor

EVENT TYPE	SUPERVISOR NOTIFIES...	TIMING[1]	... WHO NOTIFIES	TIMING[1]
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediately if external reporting required
	Project Manager	Immediately	Client and Area/Program Manager Government agency if required by contract/plan and Director, EHS Services not available (See 3.5.2)	Immediately if external reporting required
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services OSHA reporting (See 3.5.1) Insurance AIG through Chartis @ 1-800-910-2667 (Company personnel only) (Not required inside Washington State)	Immediately Immediately Immediately
	Project Manager	Immediately	Area/Program Manager VP Construction Client	Immediately Immediately Immediately
Confirmed or Potential OSHA Recordable	ESS	Immediately	PESM and Director, EHS Services Insurance AIG through Chartis @ 1-800-910-2667 (Not required in Washington State)	Same day Same day Same day
	Project Manager	Immediately	Area/Program Manager VP Construction, VP Remediation, VP C&E, COO Client, if required	Same day Same day 24 hours or as specified by contract
Equipment/Property/	ESS	Immediately	PESM and Director, EHS Services	24 hours

Vehicle Damage				
	Project Manager	Immediately	Client (client property) Client (other property, if required) Equipment Manager Area/Program Manager VP Construction	Immediately 24 hours 24 hours 24 hours 24 hours
Potential Insurance Claim, other than Worker's Compensation	Project Manager	Immediately	Law Department and Procurement	24 hours
Office Events	ESC	Immediately	Operations Manager Director, EHS Services	24 hours
Quality Events	Project Manager Project QC Manager	Immediately Same Day	Program or Operations Manager Director of Quality Programs	24 hours 24 hours

[1]Timing - Immediately - Real time verbal discussion or notification in writing
Same Day
24 hours - written event report copy; Client notification, or as specified in contract or project specification
ESS Environmental Safety Specialist ESC Environmental Safety Coordinator
PESM Project Environmental and Safety Manager QC Quality Control
VP Vice-President

Investigations that fall within the scope of the OSHA Process Safety Management Standard must meet the requirements of 29 Code of Federal Regulations (CFR) 1910.119(m). Projects that must meet this standard shall include the appropriate reporting requirements in project specific procedures or plans.

Project QC personnel should participate in the QER Cause Analysis and in determining an appropriate Action Plan.

Completed investigation reports should be submitted within 10 working days to:

a. Project Manager or Office Manager for review and signature

b. PESM or Project QC Manager (for QERS) for review and signature

c. ESS (for projects) or ESC (for offices) for review and signature

d. Director, EHS Services/Quality Services as applicable

Electronic submittal within 10 working days meets these reporting requirements. Additional reporting requirements are listed in Table 1.

The Project or Office Manager and the PESM, or Project Quality Manager must sign the report indicating their satisfaction with thoroughness of the investigation and the report and their concurrence that the action items address the identified causes. This constitutes the peer review, and the report, particularly the description, should be clear to readers not familiar with the project or incident.

3.5 External Notifications

3.5.1 OSHA Notification

Notification to OSHA is required within 8 hours if the event resulted in one or more fatalities and/or three or more hospitalized individuals. The 8-hour notification of OSHA is also required if a fatality or hospitalization of

three individuals occurs within 30 days after the event.

The Director, EHS Services, has the responsibility for making the OSHA notification. The senior site EHS representative shall make the notification if the Director, EHS Services is unavailable.

The Project Manager is responsible for notifying the client of any required OSHA notifications.

3.5.2 Agency Notifications for Spills, Releases, and Permit Exceedences

It is the Company's policy that *if a spill, release, or permit exceedence is determined to be reportable, the Company or the client shall perform the reporting in a timely fashion as defined by federal, state, or local laws and regulations*. Notifications shall be made per contract requirements or the project Communications Plan. Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures. During the conduct of project activities, the client shall be notified regarding the spill, release, or permit exceedence and the Company's notification determination.

The Project Manager, in conjunction with the PESM must determine whether a spill, release, or permit exceedence exceeds reportable quantities to a regulatory agency under federal, state, and/or local laws and regulations or permit conditions. This determination must be made quickly because many laws and regulations require that notifications be made within short time frames (immediately upon knowledge, but no later than 24 hours).

If a spill or release is determined not to exceed reportable quantities, the PESM shall evaluate whether the spill or release poses a threat to human health (for example, has or may release into known drinking water sources, has or may cause contamination of surface soils/materials/air accessible to the public, and so forth). If a spill or release is determined to pose a threat to human health, the Project Manager, with the assistance of the Director, EHS Services, as necessary, shall consult with the client to determine whether the spill or release should be reported to a regulatory agency.

3.6 Documentation

A copy of each Event Report shall be retrievable for the project or office files. The Event Report database may serve this purpose.

3.6.1 Documentation of Agency and Client Notifications

All agency and client notifications shall be documented on the **Event** Report form. Other documentation generated regarding verbal or written agency notifications (if required), including agency response to such notification, shall either be maintained in the project file or preferably, attached to the Event Report.

In instances where the client conducts the reporting, documentation shall be obtained from the client indicating that the agency was notified in accordance with federal, state, or local regulations and maintained in the project files. If the client verbally notifies the Company that the notification was made, the Project Manager shall document the conversation. In these cases, communications shall be recorded internally in accordance with EHS 1-10, External Regulatory Inspections and Notifications, for Environmental Management System reporting requirements.

If the spill, release, or permit exceedence is determined not to be reportable, the Event Report and Investigation shall include the rationale for not reporting the spill, release, or permit exceedence to a regulatory agency.

3.7 Training

The Director, EHS Services, and the Director, Quality Services, have the responsibility for ensuring that site and office supervisory personnel have the appropriate training to conduct event investigations.

ESSs shall be trained on a project-specific basis by the PESM to implement the spill/release and permit exceedence reporting requirements in conjunction with training on the requirements of the project-specific EHS Plans per Corporate Reference Library procedure EHS 3-2, Procedures—Environmental, Health & Safety Plan (s).

Personnel serving in a project or office supervision, or office supervision, ESQ position shall have completed and passed the Company provided self-study course entitled "Practical Loss Control Leadership within 3 months of initial assignment."

4.0 GUIDANCE

4.1 Definitions

4.1.1 Event

For the purposes of this program, an event is:

a. An injury or illness that meets the OSHA recordability criteria

b. Ergonomic-related pain complaints

c. An exposure to a hazardous substance above the allowable exposure unit.

d. A property/vehicle/equipment/heavy equipment/truck/passenger damage case that results in damage greater than $500.

e. A fire or explosion.

f. A spill or release resulting from the Company, or subcontractor activities, including spills or releases from operations at a client facility of which Company employees have become aware.

g. Discovery of chemicals or waste products in an office.

h. A permit exceedance.

i. Safety-related events reported by an enforcing authority (ISO 14001 Registrar requirement).

j. Customer, or enforcing authority, complaints regarding the implementation of the Company's EMS or Quality Management System (QMS).

k. External regulatory inspections that result in findings or citations.

l. Quality events as defined in Section 4.1.3.

m. Near-miss occurrences, as defined in Section 4.1.2 below[1]

4.1.2 Near Miss

A “near miss” is an event, that has a reasonable probability in resulting in one of the outcomes described above if the circumstances were different and for which modifications to management programs will reduce the probability of occurrence or the severity of the outcome (see examples of Immediate and Basic causes in Attachment A.

4.1.3 Quality Event

QERs should be generated for the following two situations:

a. When project quality deficiency reports identify a **significant condition adverse to quality**. A significant condition adverse to quality is one that, if uncorrected, could have a serious adverse effect on operability, level of quality, or presents a high loss potential.

b. When an event reveals an opportunity for improved performance through modification of our management system.

4.1.4 Recognition and EMS Communication

ZIP Slips (See PP-10, Employee Recognition Programs) may be used to document employee recognition for a job well done, suggestions for improvement, or minor safety issues that should be resolved.

ZIP Slips may be used to document external inquires or complaints regarding the Company's EMS or project-specific environmental aspects.

4.2 Continuous Improvement

TtEC's event investigation procedure and event report database is a tool used by the (ESQ) organization for continuous improvement by:

- Identifying the root causes of each event
- Tracking and trending
- Selecting appropriate corrective action(s), and person(s) responsible for corrections
- Providing Lessons Learned
- Identifying additional EHS orientation and training topics
- Identifying future health and safety goals and objectives

Corporate ESQ management periodically disseminates valuable information contained in the event/investigation program, company wide to employees in the form of ZIP Bulletins, Flash Reports, and Lessons Learned.

The EMS Coordinator should also review the Event Report database to identify trends and incorporate results into the continuous improvement of the EMS.

4.3 Cause Analysis

4.3.1 Immediate Cause

Determine the immediate causes, using the examples on the form. If one or more of the examples fits the circumstance, use those words in the cause description. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the event description is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

4.3.2 Basic Cause

Like the Immediate Causes, use the guidewords on the form whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

Investigators should determine if a change in the work conditions, scope, methods or personnel contributed to the event. This may occur due to inadequate assessment of hazard potential or inadequate application of hazard controls. If “Change” was contributing, it will most likely be identified in combination with other basic causes.

Note: The investigator is encouraged to review the Practical Loss Control Leadership chapters on *Causes and Effects of Loss* and *Accident/Event Investigation* before doing the causal analysis. The investigation team should refer to the S.C.A.T. Chart available from the PESM when analyzing causes of high loss potential events, especially where motivation is suspected of being a Basic Cause.

4.3.3 Remedial Actions

Include all actions taken or those that should be taken to *prevent recurrence*. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation.

4.4 Loss Control Leadership for Non-Supervisory Personnel

All non-supervisory and non-ESQ positions (excluding craft workers) assigned to conduct field activities should complete the Practical Loss Control Leadership self-study course within one year of initial assignment.

5.0 REFERENCES

Please Describe your Reference Here	Place Your Link in this Column
1. OSHA 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals	
2. EHS 1-10, External Regulatory Inspections and Notifications	
3. EHS 2-1, Emergency Preparedness	
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)	
5. Environmental Management System	
6. HSG 2-7, Risk Prioritization	
7. PP-10, Employee Recognition	
8.	
9.	

6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Attachment A - Event/Near Miss Report and Investigation	EHS 1-7, Att A, 2007.doc
2. Attachment B - Quality Event Report Form	EHS 1-7, Att B, 2007.doc
3. Attachment C -Event Sketch	EHS 1-7, Att C, 2007.doc

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Checkboxes can be toggled on ☒ and off ☐ to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, General Information

Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.

Type of Event/Near Miss (check all that apply):

Was a person injured or made ill:

☐ By something at work ☐ By something outside the work environment ☐ No injury or illness

Did this event occur in one of our major offices? ☐ Yes ☐ No List Office:

Did this event occur in a foreign country? ☐ Yes ☐ No

Did this event involve:

A strain?	☐ Yes ☐ No	Fire?	☐ Yes ☐ No
A motor vehicle accident?	☐ Yes ☐ No	Property damage (>$500)?	☐ Yes ☐ No
A repetitive motion injury?	☐ Yes ☐ No	Spill/release?	☐ Yes ☐ No
A fall?	☐ Yes ☐ No	Permit exceedence?	☐ Yes ☐ No
Being struck by something?	☐ Yes ☐ No		

Event Information

Case #:	Site Case #:	Workers Comp #:

Where did the event occur?	Project # (4 digits):
Site/Location Name:	Delivery Order #'s:
Date of event:	Military time:
TtEC Supervisor on duty:	Was Supervisor at event scene? ☐ Yes ☐ No

Event Location:

What employee/employer category was involved in this event?

☐ TtEC permanent
☐ TtEC craft/temp service
☐ Subcontractor
☐ Other

Employer of affected employee?

Weather conditions:	Adequate Lighting at Scene? ☐ Yes ☐ No

What was the employee doing, or what was happening, just before the event occurred? Describe the activity below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

What happened? What was the contact or event and how did it occur? Tell us below how the injury occurred. For example, "When the ladder slipped on the wet floor, the worker fell 20 feet," "worker was sprayed with chlorine when gasket broke during replacement," or worker developed soreness in wrist over time." Attach file if necessary.

Section 2, Affected Employee Information		
Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.		
Employee's name:		Sex ☐ Male ☐ Female
Date of Hire:	Job classification:	Number of months at TtEC:
Work hours on shift prior to event:		Years in job classification (##):
Did event relate to routine task for job classification? ☐ Yes ☐ No		

Section 3, Injury/Illness Information *(If not applicable, check here ☐ and go to Section 4)*
Nature of injury of illness: Describe body part affected and how it was affected below. Be more specific than "hurt," "pain," or "sore." For example, "strained back."
What object or substance directly harmed the employee? For example, "concrete floor," "chlorine," "radial arm saw." If this question does not apply to the event, leave it blank.
Was First Aid provided? ☐ Yes ☐No
Did the injury/illness result in ☐ Days away (with or without restricted days) ☐ Restricted days only ☐ No or unknown
Did employee die? ☐ Yes ☐No
Medical treatment does not include examination, diagnostic tests, or First Aid. See ZIP Bulletin 109 for OSHA definition of First Aid. Attach treatment report/doctor's note or send copies to Director, EHS Services. Was medical treatment provided? ☐ Yes ☐ No

Section 4, Vehicle and Property Damage Information *(If not applicable, check here ☐ and go to Section 5)*	
Damaged vehicle make:	Damaged vehicle model:
Damaged vehicle VIN:	Vehicle owner:
Property damaged:	
Describe property damage:	

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Section 5, Environmental Release *(If not applicable, check here ☐ and go to Section 6)*		
Environmental Release		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? ☐ Yes ☐ No	
RQ exceeded? ☐ Yes ☐ No	Specify RQ:	
Reportable to agency? ☐ Yes ☐ No	Specify (place telecom in project file):	
Responsibility to report: ☐ TtEC ☐ Client ☐ Other	Time frame:	
Written report (place report in project file): ☐ Yes ☐ No		
Response action taken:		
Permit Exceedence		
Type of permit:	Permit #:	
Date of exceedence:	Parameter(s):	
Criteria:	Exceedence levels:	
Exceedence duration:	Reportable to agency: ☐ Yes ☐ No	
Specify (place telecom in project file):	Written report: ☐ Yes ☐ No	
Time frame:		
Response action taken:		
Section 6, Notifications		
Insert names of TtEC personnel notified below:		
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Name:	Date:	Time:
Client rep notified:	Date:	Time:
By whom:		
Agency notified:	Date:	Time:
By whom:		
Agency Contact Name:		
Section 7, Persons Preparing Report		
Signature of this form verifies that all supplied information is accurate.		
Employee's name (print):	Sign:	
Employee's name (print):	Sign:	
Supervisor's name (print):	Sign:	
Supervisor's phone number:		
Date:		
Note to supervisor: Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.		

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Section 8, Attach Sketches or Photos		
Report Number:		
Send sketch by mail, fax, or attach an electronic file. EHS 1-7, Attachment C, contains a template that can be used for creating sketches of accidents.		
Vehicle Events		
Write in the street names and, if possible, the points of the compass. Attach black-and-white hard-copy photos or JPG or BMP files (JPG file sizes are typically smaller) as appropriate. If the sketch appears on a police report or insurance form, this need not be completed. Attach the other report or send a hard copy to the Director, EHS Services.		
Section 9, Investigative Report		
Date Information:		
Date of event:	Date of investigative report:	
Event Cost:		
Other event costs: $	WC claim value: $	Estimated loss: $
Cause Analysis		
Was the activity addressed in an AHA? ☐ Yes (attach applicable section) ☐ No		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
☐ Operating equipment without authority	☐ Horseplay	
☐ Failure to warn	☐ Using equipment improperly	
☐ Failure to secure	☐ Failure to follow procedure	
☐ Operating at improper speed	☐ Personnel not properly qualified	
☐ Making safety devices inoperable	☐ Failure to communicate	
☐ Removing safety devices	☐ Operating equipment outside of specified parameters	
☐ Using defective equipment	☐ Failure to check equipment prior to acceptance	
☐ Failure to use PPE properly	☐ Acceptance of defective equipment	
☐ Improper loading	☐ Failure to provide proper equipment	
☐ Improper placement	☐ Improper servicing/maintenance of equipment	
☐ Improper lifting	☐ Other substandard acts	
☐ Improper position for task	☐ Servicing equipment in operation	
☐ Under influence of alcohol/drugs		
Substandard Conditions		
☐ Guards or barriers	☐ Exposure to hazardous materials	
☐ Protective equipment	☐ Extreme temperature exposure	
☐ Tools/equipment or materials	☐ Illumination	
☐ Congestion	☐ Ventilation	
☐ Warning system	☐ Visibility	
☐ Fire and explosion hazards	☐ Radiation	
☐ Poor housekeeping	☐ Hazardous environmental conditions	
☐ Noise exposure	☐ Other substandard conditions	

Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Enter brief explanation of each ***immediate cause*** below:	
Basic Causes	
What specific personal or job factors contributed to this event? Check all that apply:	
Personal Factors	**Job Factors**
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of knowledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors
Enter brief explanation of each ***basic cause*** below:	

Section 10, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
☐ Leadership and administration	☐ Health control
☐ Training	☐ System evaluation
☐ Planned inspections	☐ Engineering controls and change management
☐ Task analysis and procedures	☐ Personal communications
☐ Task observation	☐ Group meetings
☐ Emergency preparedness	☐ General promotion
☐ Rules and work permits	☐ Hiring and placement
☐ Accident/event analysis and corrective and preventive action	☐ Materials and services management
☐ Personal protective equipment	

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment A
Event/Near Miss Report and Investigation

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		

Section 11, Persons Performing Investigation	
Investigator's name:	Date:
Investigator's name:	Date:
Investigator's name:	Date:

Management Review	
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.	
Project/Office Manager Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
ESQ (PESM) Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.	

Corporate ESQ Report # Insert number here
Project Name: Insert name here

EHS 1-7, Attachment B
Quality Event Report and Investigation

Checkboxes can be toggled on ☒ and off ☐ to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

Section 1, Event Description and Investigation			
Date of event:			
Office/Project Location:		Organization or Department:	
Means of identification:			
☐ Client concern	☐ Nonconformance report	☐ Audit report	☐ Corrective action request
☐ Supervisory review	☐ Peer review	☐ Project review	☐ Other (describe):
Enter Short Description/Title (limited to 125 characters) below. This is the description that will appear in the database listing.			
Issue Summary: Summarize the concern, problem, or situation that needs to be addressed. Identify who was involved and their role (e.g., performer, inspector, auditor).			

Section 2, Persons Preparing Report	
Signature of this form verifies that all supplied information is accurate.	
Employee's name (print):	Sign:
Employee's name (print):	Sign:
Supervisor's name (print):	Sign:
Supervisor's phone number:	
Date:	
Note to supervisor: Supervisor is to forward a copy of the Event Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.	

Section 3, Investigative Report		
Date of investigative report:		
Other event costs: $	WC claim value: $	Estimated loss: $
Cause Analysis		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
☐ Operating equipment without authority	☐ Inadequate inspection/peer review	
☐ Failure to follow/improper execution of procedure	☐ Poor judgment	
☐ Using equipment improperly	☐ Failure to communicate—written and/or verbal	
☐ Improper servicing/maintenance of equipment	☐ Acceptance of defective equipment/material	
☐ Under influence of alcohol/drugs	☐ Other substandard acts	
☐ Horseplay		

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment B
Quality Event Report and Investigation

Substandard Conditions	
☐ Personnel not properly qualified or trained	☐ Inadequate oversight
☐ Defective equipment/material	☐ Inadequate procedure/instruction
Enter brief explanation of each ***immediate cause*** below:	
Basic Causes	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	**Job Factors**
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of knowledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors
Enter brief explanation of each ***basic cause*** below:	
Section 4, Action Plan	
What has or should be done to control each of the causes listed? Consider the following Management Programs in developing remedial actions:	
☐ Leadership and administration	☐ Engineering controls and change management
☐ Training	☐ Personal communications
☐ Planned inspections	☐ Group meetings
☐ Critical task analysis and procedures	☐ General promotion of Loss Control principles
☐ Task observation	☐ Hiring and placement
☐ Rules and work permits	☐ Materials and services management
☐ Accident/event analysis and corrective and preventive action	☐ Quality control
☐ System evaluation	

Corporate ESQ Report # **Insert number here**
Project Name: **Insert name here**

EHS 1-7, Attachment B
Quality Event Report and Investigation

Remedial Actions			
Actions	Person Responsible	Target Date	Completion Date
1.	1.		
2.	2.		
3.	3.		
4.	4.		

Section 5, Persons Performing Investigation	
Investigator's name:	Date:
Investigator's name:	Date:
Investigator's name:	Date:

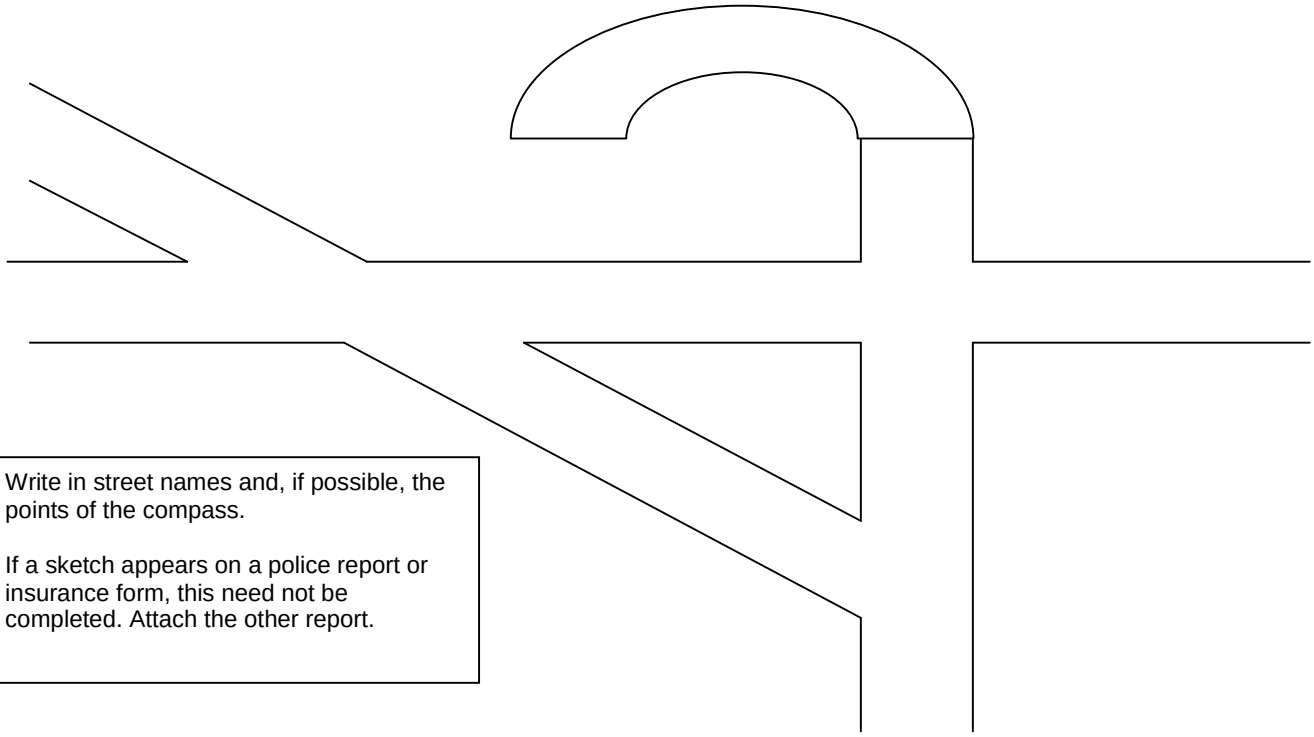
Management Review	
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.	
Project/Office Manager Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
ESQ (PESM, QA) Approval: ☐ Yes ☐ No	
Comments:	
Sign:	Date of Approval:
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.	

EHS 1-7, Attachment C
Event/Near Miss Report and Investigation Sketch Template and Instructions

Event/Near Miss Report and Investigation Sketch Template

Event Sketch

Vehicle Events



Write in street names and, if possible, the points of the compass.

If a sketch appears on a police report or insurance form, this need not be completed. Attach the other report.

EHS 4-2 : Hazard Communication

Last Revision By: Kennedy Lugo on 11/16/2010
Created By: Lisa Kaminski on 03/01/2000

Purpose:	The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.		
Version Date:	04/04/2000 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Communication, Training, Operational Control	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents

1.0 PURPOSE

The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.

2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) operations where employees have potential exposure to hazardous chemicals as a result of their normal job duties or a foreseeable emergency. This program does not apply to hazardous wastes. However, TtEC will provide employees with information on the potential hazards of wastes in accordance with 29 CFR 1910.120(e) and (i).

3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

4.0 DEFINITIONS

4.1 Chemical Manufacturer

A work place where chemical(s) are produced for use or distribution.

4.2 Exposed Worker

Any worker subjected to a hazardous chemical in the workplace through any route of entry (inhalation, ingestion, skin contact, absorption, etc.).

4.3 Foreseeable Emergency

Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that could result in an uncontrolled release of a hazardous chemical into the workplace.

4.4 Hazardous Chemical

Any chemical that constitutes a physical or health hazard. Chemicals with a label containing the words CAUTION, WARNING, or DANGER indicate the chemical is hazardous. Consumer products are not considered hazardous where it can be demonstrated that the products are used in the workplace in the same manner as for normal consumer use.

4.5 Material Safety Data Sheet (MSDS)

Written or printed material describing characteristics, hazards, and controls associated with a specific chemical or combination of chemicals.

4.6 Work Area

A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Environmental, Health and Safety Personnel

The Environmental Health and Safety Supervisor (ESS) or Office Environmental and Safety Coordinator (ESC) shall ensure that:

- A list(s) of hazardous chemicals is developed for each work site or office;
- A current MSDS is maintained on file;
- MSDSs are available to employees; and
- Employees understand how to read an MSDS, know the location of the MSDSs and understand the potential hazards of the chemicals with which they are working.

5.1.2 Procurement

Procurement personnel are responsible for ensuring that:

- An MSDS is received with all new shipments of hazardous chemicals;
- Contacting the supplier when an MSDS is not received; and
- A copy of the MSDS is forwarded to the ESS or ESC.

5.2 General Guidelines

The HAZCOM regulation sets requirements for information and training on hazardous chemicals used in the work place. Federal law requires that all states comply with hazard communication regulations, and many states and local governments have adopted their own “equally or more stringent” hazard communication standards. Therefore, applicable state and local requirements must be consulted when conducting projects in states that have their own standards. The following are guidelines for complying with federal requirements.

5.3 Labeling

The HAZCOM regulation requires that the employer ensure the following:

- Each container of hazardous chemicals in the work place is labeled, tagged, or marked with the following information:
  - Identity of the hazardous chemical(s);
  - Appropriate hazard warnings; and
  - Name and address of the chemical manufacturer, importer, or other responsible party.

- Existing labels on incoming containers of hazardous chemicals are not removed or defaced, unless the container is immediately marked with the required information.

- Labels or other forms of warning are legible, are in English, and are prominently displayed on the container, or readily available in the work area throughout each work shift.

5.3.1 Label Warning Systems

The types of common label warning systems are:

1. The National Fire Protection Association (NFPA) Standard defines five degrees of hazard in each of the following three categories: Emergency health hazard, fire hazard, and instability or reactivity hazard. NFPA warning labels are an acceptable means of labeling hazardous chemicals provided that employees are trained on the NFPA labeling system.

2. The Consumer Product Safety Commission requires precautionary labeling on every hazardous chemical intended for household use. Basic precautionary information and labeling terms have been identified by the Manufacturing Chemists Association including the following:

- Toxic
- Highly toxic
- Flammable
- Extremely flammable
- Corrosive
- Irritant
- Poison

3. The Department of Transportation (DOT) requires shipping containers of hazardous chemicals to be labeled in accordance with the appropriate hazard class. DOT has established nine hazard classes:

- Explosives
- Gases
- Flammable liquids
- Flammable solids
- Oxidizers/ Organic peroxide
- Poisons/infectious substances
- Radioactive materials
- Corrosives
- Miscellaneous hazardous materials

All TtEC projects shall use the name of the hazardous chemical and the NFPA system for labeling portable and stationary containers that are not appropriately labeled. This includes containers that are for general use (e.g., gasoline cans) and containers that have materials transferred to them from original containers.

“Prop 65” rules in California require special warnings when personnel may be exposed to substances "Known to the State” to be carcinogens or reproductive hazards. If materials which are subject to “Prop 65” are used at a California site, review the warnings referenced below during the HAZCOM portion of site-specific training. In addition, the Site Environmental, Health and Safety (EHS) plans will identify contaminants of concern that fall under “Prop 65”.

- For exposure to a chemical known to the state to cause cancer:
  "WARNING: This product contains a chemical known to the State of California to cause cancer."

- For exposure to a chemical known to the state to cause reproductive toxicity:
  "WARNING": This product contains a chemical known to the State of California to cause birth defects or other reproductive harm."

5.3.2 Personal Responsibilities

Personnel using or handling any chemical shall complete the following steps when handling chemicals:

1. Read the label on the container. If special instructions are provided, they will usually be part of the label;

2. Look for information concerning special precautions for personal protection;

3. Note appropriate first aid in case of an exposure;

4. Become familiar with the various types of labels and their warnings; and

5. Consult the MSDS for further warnings or requirements.

5.3.3 Specific Labeling Requirements

Hazardous substances that have specific labeling requirements under other standards include the following:

- Carcinogens
- Lead
- Asbestos
- Hydrogen, oxygen, and anhydrous ammonia
- Cotton dust
- Formaldehyde

5.4 Material Safety Data Sheets

5.4.1 General Information

The MSDS is used to relay chemical hazard information from the manufacturer/importer to the employer and employee. The HAZCOM regulation requires an MSDS for each hazardous material product an employee packages, handles, or transfers. The HAZCOM regulation does not require an MSDS sheet for hazardous wastes. Only those hazardous chemicals brought onto the job site by the contractor are required to have an MSDS sheet. However, the site-specific EHS plans will contain similar information on the known or potential site contaminants.

5.4.2 MSDS Contents

MSDSs that are received with incoming shipments of hazardous chemicals shall be maintained in an on-site file or office file by the ESS or ESC and shall be made available to all site or office employees. Each MSDS shall include the following information:

- Trade name of the chemical (if appropriate);
- Name, address, and telephone number for hazard and emergency information;
- Date of MSDS preparation;
- Chemical and common name of all ingredients;
- Occupational Safety and Health Administration (OSHA) permissible exposure limits, American Conference of Governmental Industrial Hygienists threshold limit values and other applicable limits;
- Physical and chemical characteristics;
- Physical hazards;
- Primary route(s) of entry into the body, such as inhalation, ingestion, or skin absorption;
- Acute and chronic health hazards, including signs and symptoms of exposure and medical conditions aggravated by exposure;
- Carcinogenic hazards;
- Emergency and first aid procedures;
- Precautions for safe handling and use; and
- Engineering/exposure control measures and personal protective equipment.

Attachment A provides an overview of the information contained in an MSDS.

Upon receipt of an MSDS (with a shipment of chemicals or otherwise) the following steps shall be performed:

1. The MSDS shall given to the ESS or ESC who inspects it for completeness. If incomplete, the MSDS is returned to the manufacturer with a request for a complete MSDS. Attachment B or an equivalent should be used to contact the supplier or manufacturer. After sending the letter the supplier or manufacturer should be contacted by phone.

2. If the MSDS is complete, the ESS or ESC places a copy of the complete MSDS into the site project or office file.

3. If a revised version of an MSDS is received, the old version of the MSDS is stapled to the revised MSDS and placed in the site project or office file.

If no MSDS is received with a shipment of chemicals Attachment B or an equivalent shall be used to request an MSDS from the supplier or the manufacturer. After sending the letter, the supplier or manufacturer should be contacted by telephone.

Copies of all correspondence, telephone contact and MSDSs shall be maintained in the project or office files.

MSDSs are a good source of information for those seeking quick hazardous material references. In the case of emergencies, however, not all of the pertinent information is provided and at times the information may be more damaging than helpful. Response to any emergency requires quick judgement calls. If there is any question of which first aid procedures to follow, it is best to call the emergency number provided on each MSDS specific to the material in question.

5.5 Non-Routine Activities

All TtEC employees and subcontractors must be informed of the hazards associated with chemicals involved in non-routine activities. For the purpose of this guideline, non-routine activities include, but are not limited to, line breaking/pipe opening, confined space entry, tank cleaning, and other maintenance of process equipment.

Hazards of non-routine tasks are addressed in site-specific EHS plans and Activity Hazard Analyses and are reviewed with the work crew during phase preparatory meetings or daily briefings.

5.6 Employee Information and Training

Employee information and training shall be provided as part of the employee's EHS training. This documentation includes the initial hazardous waste training certificate and site-specific or office training documentation.

The following are required elements of the information and training program:

- An overview of HAZCOM;
- A review of any operations in their work areas that involve hazardous materials;
- The location and availability of the written Hazard Communication Program, including the list(s) of hazardous chemicals and MSDSs;
- Methods and observations that may be used for detecting the presence or release of hazardous chemicals;
- An understanding of the physical and health hazards of hazardous chemicals in the work area;
- How to understand the information in MSDSs;
- How to read the warnings on container labels including the NFPA system;
- When and how to report leaks and spills;
- How to recognize the symptoms of overexposure and how to protect against it; and
- How to implement exposure control methods including work practices, engineering controls, administrative controls, personal protective equipment, and emergency procedures.

Hazard communication training is provided during initial training, site-specific and office orientation, supervisor training, and 8-hour refresher training as specified in EHS 1-11, Training. Attachment C or an equivalent may be used to document training and ensure training is in compliance with the Hazcom regulations.

In the event that a new chemical hazard or new task is introduced in the workplace, the ESS or ESC shall conduct additional training that includes the following:

- Objectives of the task, if applicable;
- Physical and health hazards associated with the new chemical hazard or task;
- Methods to detect the presence or release of the hazardous chemicals;
- Procedures and practices recommended to protect themselves from the hazards;
- Emergency procedures in the event of a hazardous situation or exposure; and
- Location and availability of the written program, lists of chemicals, and MSDS.

Documentation is maintained for each employee trained in hazard communication in accordance with EHS, 1-9, Recordkeeping.

5.7 Subcontractors

Subcontractors working for TtEC shall be required to meet the EHS requirements outlined in their contracts. To help meet these requirements, subcontractors are informed of TtEC procedures by the ESS and instructed on where to find information on hazardous chemicals being used on the project.

6.0 REFERENCES

29 CFR 1910.1200, Hazard Communication.
49 CFR 100-181, Hazardous Materials Transportation.
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping
Environmental, Health & Safety - Programs Procedure EHS 1-11, Training
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)
U.S. Department of Transportation (DOT)

7.0 ATTACHMENTS

EHS 4-2 ATTACHMENT A

MSDS OVERVIEW

Click the icon below to launch or download.

EHS 4-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 4-2 ATTACHMENT B

MSDS LETTER TO SUPPLIER OR MANUFACTURER

Click the icon below to launch or download.

EHS 4-2 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 4-2 ATTACHMENT C

HAZARD COMMUNICATION CHECKLIST

Click the icon below to launch or download.

EHS 4-2 Attachment C.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 4-2 ATTACHMENT A

TETRA TECH EC, INC.
MATERIAL SAFETY DATA SHEET OVERVIEW

The following is provided to aid in the understanding of a typical Material Safety Data Sheet (MSDS). The actual format of the MSDS may vary.

Section I gives the identity of the chemical as it is on the label. Included is the name and address of the company that makes or imports the chemical, the emergency phone numbers to call for emergency or additional information, and the date the MSDS was prepared.

Section II shows where you will find the hazardous component, chemical identification, and common names. Worker exposure limits to the Occupational Safety and Health Administration permissible exposure limits and American Conference of Governmental Industrial Hygienists threshold limit values and other recommended safe exposure limits are included. Even if the chemical makeup is a trade secret the safety precautions are still given.

Section III describes the physical and chemical characteristics of the hazardous chemical, which can be complicated. If there is uncertainty, a supervisor or a glossary of common terms should be consulted for a better understanding of how the items could effect you in different work situations.

- The boiling point and melting point is where a liquid at a certain temperature will change from liquid to breathable gas.

- Vapor pressure, vapor density, and evaporation rate are especially important for toxic gases and vapors.

- Solubility in water and specific gravity tells you if a chemical will dissolve in water, sink or float.

Section IV helps judge the risk of fires and explosions. The flash point refers to the minimum temperature needed to initiate explosive conditions. Flammability limits indicate the concentration of the substance in the form of a gas or vapor that is needed for the gas or vapor ignite. It also gives instructions as to what to use (e.g., water, C02 foam) to put out a fire and any special hazards associated with the fire fighting procedures.

Section V reveals the reactivity of the chemical, i.e., under what conditions it is stable or not stable. The data indicate how possible reactions may be reduced and describes spill prevention and storage precautions.

Section VI describes the chemical's primary route(s) of entry into the body (e.g., inhalation, ingestion) and presents exposure symptoms (e.g., headaches, nausea, dizziness and rashes). Some effects occur right after exposure (e.g., a skin bum), while others have long-term or chronic effects (e.g., cancer). It also tells of existing conditions such as asthma that can be made worse by exposure to the chemical. Lastly, first aid procedures are offered should you be exposed and become ill or injured.

Section VII provides precautions for a safe handling and use of the chemical, explaining what to do if there is a spill, leak, or any accidental release, the waste disposal methods to be taken, and any precautions in the handling and storage of the chemical.

Section VIII describes the protective clothing and equipment (e.g., respiratory, gloves, eye protection) that should be used with the chemical as well as the appropriate work/hygienic practices.

Many of the terms used in MSDSs can be abbreviated and are technical in nature. A glossary of common terms used in MSDSs can be used as an aid in comprehension.

EHS 4-2 ATTACHMENT B
MSDS LETTER TO SUPPLIER OR MANUFACTURER

TETRA TECH EC, INC.

Date

Manufacturer Name
Street Number
City, State Zip Code

Dear Sirs:

We recently received a shipment of chemicals from your firm that was deficient in the following:

____ No Material Safety Data Sheet (MSDS) was present for the chemicals received.

____ The MSDS received did not contain adequate information as follows.

Listed below are the products requiring the above information. Pursuant to 29 CFR 1910.1200, I respectfully request that the appropriate MSDS for these items be sent to the above address, marked to my attention. Your cooperation is greatly appreciated.

Sincerely,

TETRA TECH EC, INC.

ESS or ESC
Title

EHS 4-2 ATTACHMENT C

TETRA TECH EC, INC.
HAZARD COMMUNICATION CHECKLIST

Project/Office Name: _____

Location: _____ Date: _____

Form Completed By: _____

____ 1. Have we prepared a list of all the hazardous chemicals in our workplace?

____ 2. Are we prepared to update our hazardous chemical list?

____ 3. Have we obtained or developed a material safety data sheet (MSDS) for each hazardous chemical we use?

____ 4. Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and MSDS?

____ 5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?

____ 6. Are our employees aware of specific information and training requirements of the Hazard Communication Standard?

____ 7. Are our employees familiar with the different types of chemicals and the hazards associated with them?

____ 8. Have our employees been informed of the hazards associated with performing nonroutine tasks?

____ 9. Do our employees understand how to detect the presence or release of hazardous chemicals in the workplace?

____ 10. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work areas?

____ 11. Does our training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure?

____ 12. Does our training program explain the types of labels and warnings used in each work area?

____ 13. Does the training describe where to obtain data sheets and how employees may use them?

____ 14. Have we worked out a system to ensure that new employees are trained before beginning work?

____ 15. Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?

____ 16. Do we have a system for informing employees when we learn of new hazards associated with a chemical we use?

EHS 3-15 : Underground Utilities

Last Revision By: Deborah Rambarose on 05/12/2010
Created By: Deborah Rambarose on 04/03/2002

Purpose:	This program provides requirements and recommendations relative to identification, location, avoidance, and management of underground utilities, appurtenances, and structures during intrusive activities.		
Version Date:	05/16/2002 - Revised	**Original Issue Date:**	02/20/2002
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents

Section

1.0 PURPOSE

This program provides requirements for identification, location, and avoidance of underground utilities, appurtenances, and structures during intrusive activities, as defined in Section 4.0. The program also addresses actions to be taken in response to encountering or contacting underground utilities.

2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations. The procedures address the requirements and recommendations for identifying and locating, working around, and encountering or contacting underground utilities.

3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs, is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

4.0 DEFINITIONS

4.1 Aggressive Methods

The use of mechanized equipment such as excavators, backhoes, drill rigs, directional drilling, road saws, etc. Non-Aggressive methods involve the use of manual or non-mechanized methods such as hand-digging with shovels and air/hydro/vacuum methods.

4.2 Buffer Zone

As defined in this procedure, the area around a utility where only non-aggressive excavation methods may be utilized, unless specific conditions are met.

The definition cited above, and the excavation requirements and restrictions associated with it, will vary depending on the particular state regulations. TtEC requires the imposition of a four-foot Buffer Zone on all sides of the utility as measured from the outside edges of the utility, both horizontally and vertically. Since most jurisdictions recognize Buffer Zones which vary somewhere in the range of 18 to 36 inches, this distance must be verified by consulting the applicable state regulations before excavating so that adjustments to surface markings can be made to achieve the TtEC-required four-foot buffer zone.

Referred to as the “Tolerance Zone”, “Safety Zone”, or “Approximate Location of Underground Utilities” in some jurisdictions.

Information relative to excavation within the buffer zone is contained in Section 5.2.2.4.

4.3 Competent Person

A Competent Person has the ability to recognize hazards associated with underground utilities and the authority to stop or direct operations to ensure the safety of personnel and conformance with this procedure. The Competent Person has an understanding of this procedure, and the “One-Call” system requirements for the jurisdiction where excavation is occurring. The Competent Person must be capable of notifying One-Call agencies and maintaining and tracking One-Call Locate Numbers. Additionally, they must have knowledge of methods and work practices for utility identification, avoidance, and protection.

4.4 De-Energize

As applicable to a utility, to physically eliminate and/or prevent the presence, transmission, flow, or release of energy or materials which may cause harm to personnel or property.

4.5 Excavation

An operation for the purpose of movement or removal of earth, rock, or the materials in the ground, including but not limited to; digging, blasting, augering, backfilling, test boring, drilling, pile driving, directional drilling, grading, plowing-in, hammering, pulling-in, jacking-in, trenching, tunneling, structural demolition, milling, scraping, tree and root removal (grubbing), fence or sign post installation. TtEC requires that the designated One-Call agency for the applicable jurisdiction be contacted any time an intrusive activity is planned.

4.6 Jurisdiction

The authority having legal jurisdiction relative to regulations and requirements for notification of excavation activities and associated identification and marking. In the United States, the states have jurisdiction, and most consider the regulations applicable when excavation is to be performed in any location, including any public or private way, any company right-of-way or easement, or any public or privately owned land or way.

4.7 Locate

To indicate the existence of a utility by establishing a mark through the use of flags, pins, stakes, paint, or some other customary manner, that approximately determines the location of a line or facility.

4.8 Locate Request

A communication between an entity performing intrusive activities and a utility marking agency (One-Call, etc).

4.9 Observer

The person assigned to visually monitor and, as needed, signal the operator during mechanized intrusive activity when the activity is occurring within four feet of the outside edge of the buffer zone. This person remains in close communication with the equipment operator(s) and will stop the activity if needed.

4.10 One-Call Agency

An entity that administers a system through which a person can notify owners/operators of underground lines or utilities of the intent to perform intrusive activities in proposed public areas.

4.11 Positive Response

Communication with the entity performing intrusive activities, prior to the activity, to ensure that all contacted (typically via the One-Call agency) owner/operators have located and marked the underground utilities.

4.12 Potholing

The practice of exposing an underground facility by safe, non-aggressive excavation methods in order to ascertain the precise horizontal and vertical position and orientation of underground lines or utilities.

4.13 Underground Utility

An underground or submerged conductor, pipe, or structure used in providing electric or communications service (including but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto. As used in this procedure, utility includes all underground appurtenances and structures.

The following are examples of the types of underground utilities that may be present in a given location:

- Natural gas pipelines
- High voltage electric cables
- Water pipelines
- Fiber optic telecommunications lines
- Steam pipelines
- Gasoline, oil, or other fuels
- Sewer pipelines
- Hazardous Materials
- Underground Storage Tanks (USTs)
- Abandoned underground structures containing hazardous materials, hazardous wastes, and radioactive materials

Note: Electrical and pressurized mechanical underground utilities that are not energized shall be considered as applicable to the requirements of this procedure until they are disconnected and removed or protected by a lockout/tagout system approved by TtEC (see Section 5.2.2.6)

4.14 Underground Utility Owner

Any person, utility, municipality, authority, political subdivision or other person or entity who owns, operates, or controls the operation of an underground line/facility.

4.15 White Lining

The practice whereby the entity which intends to perform intrusive activities pre-marks the site with an outline of the area where intrusive activities will occur. This involves the use of white paint, flags, stakes, or a combination thereof to mark the extent of where work is to be performed. The marking may vary depending on what intrusive activities are to be conducted. For example, for general excavation, an areal outline of the excavation shall be marked, while for drilling, the individual boreholes shall be marked. Studies have shown that pre-marking is a practice that does prevent utility contact incidents.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Competent Person

The Competent Person shall be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the state of jurisdiction where the excavation activities are to be performed.
- Contacting the appropriate One-Call agency or private locating service, as applicable.
- Recording One-Call locate numbers.
- If necessary, renewing One-Call locate numbers before expiration.
- Ensuring that white-lining of the area to be excavated is performed.
- Ensuring that a “positive response” has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and have appropriately marked any potential conflicts with the areas of planned intrusive activities.
- Completion of the *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B).
- Reviewing applicable AHAs with all project members before work begins.
- Conducting training on communication protocols to be used by the excavation observer and equipment operator.
- Ensuring Implementation of appropriate work practices during intrusive activities (including maintaining the prescribed buffer zone for use of aggressive methods).
- Conducting daily inspections of the excavation area to make sure that all markings are intact.
- Maintaining required records.
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

5.1.2 Observer

Whenever intrusive operations with mechanized equipment are being conducted within four feet of the outside edge of the buffer zone, horizontally and vertically, an observer must be assigned to monitor the activities. The observer is responsible for:

- Observing the operation to ensure that the operator stops operations if utilities are observed.
- Reviewing hand signals and other forms of communication with the operator.
- Properly signaling the operator.
- Stopping the operation immediately if the observer’s attention must be diverted even momentarily.
- Stopping the operation immediately if a hand signal or other directive is not followed. Operations will not resume until the observer and operator mutually agree that the reason(s) for not complying with the directive(s) are/is identified and fully corrected.
- Maintaining required records, such as logbook entries, or other, as requested by line management.

5.1.3 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure.
- Providing the necessary resources for compliance with this procedure.
- Designating Competent Personnel in consultation with the Project Environmental, Health and Safety Manager (PESM) prior to the start of work.

5.1.4 Environmental, Health and Safety Personnel

The Environmental and Safety Supervisor (ESS) shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure.
- Consulting with the PM and Competent Person on underground utility issues.

5.2 Procedure

The following sections provide the requirements and recommendations of this procedure, which are intended to prevent injury to personnel, damage to infrastructure, and associated indirect effects associated with encountering or contacting underground utilities during the execution of intrusive work. Underground utilities present multiple potential hazards that must be recognized before and during work which occurs near them, therefore, this procedure is divided into sections addressing underground utility identification and location, working around or near underground utilities, and actions to be taken in the event that underground utilities are encountered or contacted. Hazards that may be presented by underground utilities include explosion and fire, electrocution, toxic exposures, pathogens, and drowning.

5.2.1 Identifying and Locating Underground Utilities

The possibility of the existence of underground utilities must be evaluated as early as possible in the planning phase for any project which involves intrusive activities, as defined in Section 4.2. The Task Initiation Procedure (TIP) form should be used for documentation of the identification of this potential hazard and the procedures to be followed to address them. The following sections describe various methods for identifying and locating utilities on a site. Plans should be verified during the readiness review. The *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B) must be completed before any activities meeting the definition of excavation in Section 4.2 are conducted. Attachment A is intended to be used as a guide during the process of locating and marking utilities in the area to be excavated. Attachment B is intended to be used as a guide in the overall process of underground utilities management during the course of the project.

All underground utilities on a site involving excavation as defined in Section 4.4, must be located and identified before intrusive activities commence, by one or more of the following entities:

- The Utility Owner
- A Private or Public Utility Locating Service
- An Approved TtEC Competent Person

These options are described in greater detail in the following Sub-Sections:

5.2.1.1 Pre-Planning and the Site EHSP

- The Site-Specific Environmental Health and Safety Plan (EHSP) developed for the project must:
- Identify the location and types of underground utilities that are believed to be present on the site.
- Reference this procedure (EHS 3-15), and describe how it will be implemented on the project.
- Contain an Activity Hazard Analysis in which the hazards associated with underground utilities are identified, as well as the measures used to control them.
- Contain, as an appendix, a copy of the applicable regulations from the state of jurisdiction where excavation activities are to be performed. These can usually be obtained via the Internet.
- Contain clear and concise procedures to be followed in the event that contact with underground utilities occurs.
- Address underground utilities and potential associated scenarios in the emergency response section of the EHSP.

5.2.1.2 “One-Call” Locating and Marking Services

Every state has utility marking service programs having various names such as “One-Call”, “Dig-Safe”, “Call-Before-You-Dig”, “Dig-Safely”, and many others. These services will identify the types and locations of any utility that may exist in an area to be excavated, as long as the property is in the public domain.

- The appropriate One-Call service for the jurisdiction where the project is located must be contacted prior to beginning excavation work. The One-Call agency should be given as detailed a description of the property as possible; address, cross street, utility pole numbers, physical description, etc.
- Notification to the One-Call service shall allow sufficient lead time for the agency to mark the utilities before excavation begins. The lead times vary, but range from two to ten days, depending on the state of jurisdiction.
- A complete listing of One-Call agencies and telephone numbers for all states is available in the *“Call-Before-You-Dig Call Center Directory”*, which can be accessed on the Internet at the WebPage (http://www.agc.org/galleries/default-file/State%20One%20call%20Centers%20Laws.doc) sponsored by *“Underground Focus”* magazine.
- Once notified, the One-Call agency will provide the contractor with a unique “locate number” or

"reference number". This reference number must be kept in the project files by the Competent Person or designee. Additionally, the reference numbers have expiration dates, which may vary depending on the particular One-Call agency. The valid period of the locate number and required renew notification date shall be requested from the One-Call agency.

- On a project with multiple contractors, each contractor must request a separate locate number. Under no circumstances will any other contractor or entity be allowed to "work under our locate number". Subcontractors to TtEC may excavate under the locate number secured by TtEC, provided that they are excavating within the area which was previously white-lined by TtEC and subsequently marked. **However, the One-Call agency must be contacted and notified of this arrangement so that the subcontractor can be recorded as working under the existing locate number.** If a TtEC subcontractor will be excavating in an area not white-lined by TtEC, then the TtEC subcontractor must request a new locate.
- The area where work is to be performed shall be white-lined by TtEC personnel before the locating service goes to the site.
- It is good practice to arrange a pre-excavation meeting at the project site with the personnel performing the utility location and marking. This meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high-priority utilities.
- The One-Call agency should provide the identities of the utility owners that will be notified of the locate request. This information shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and maintained in the project files. The contact person and phone number for each utility owner shall also be recorded.
- The utility owners should provide a "positive response" relative to the locate request, which can consist of two types of action by the utility owner. The facility owner or operator is required to 1) mark it's underground utilities with stakes, paint, or flags, or 2) notify the excavator that the utility owner/operator has no underground utilities in the area of the excavation.
- The positive responses shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and cross-checked with the list of utility owners that the One-Call agency stated that they would notify. If it is discovered that a utility owner has not provided a positive response, then the One-Call agency must be notified.
- Excavation shall not be conducted until positive responses have been received from all utility owners identified by the One-Call agency as having underground utilities on the property.
- Before beginning excavation, the excavator must verify that the location marked was correct, and the distinct, color-coded markings of all utility owners are present.
- Examine the site to check for any visible signs of underground utilities that have not been located and marked such as pedestals, risers, meters, warning signs, manholes, pull boxes, valve boxes, patched asphalt or concrete pavement, areas of subsidence, fresh sod or grass, lack of grass or vegetation, and new trench lines.
- The markings placed by the utility owners must be documented by TtEC using a still, digital, or video camera. The photo-documentation shall be maintained with the project files indefinitely.
- The markings placed by the utility owners or marking services shall follow the American Public Works Association Uniform Color Code as described in ANSI Standard Z 535.1. This code appears below.

American Public Works Association Uniform Color Code

Red		Electric Power Lines, Cables, Conduit
Orange		Communications, Telephone, Cable TV
Yellow		Gas, Oil, Steam, Petroleum or Gaseous Materials
Green		Sewers and Drains
Blue		Potable Water Systems
Purple		Reclaimed Water, Irrigation, Slurry Lines
Pink		Temporary Survey Markings
White		Proposed Excavation

5.2.1.3 Private Utility Locating and Marking Services

- As discussed in Section 5.2.1.1, One-Call agencies arrange for the identification and marking of underground utilities only on public property, up to the point of contact with private property. In the event that excavation activities are to be conducted on non-public properties, the presence, location,

depth, and orientation of all underground utilities within the white-lined area shall be ascertained through records review, including any site plot plans, utility layout plans, and as-built drawings available from the property owner, as well as through interviews with knowledgable personnel associated with the property. Additionally, the information gathered from these sources shall be verified by physical detection methods (non-aggressive), performance of a geophysical survey, or by procuring the services of a private utility locating and marking service. If any detection methods are to be self-performed, the requirements of 5.2.1.4. must be followed.

The above requirements are also intended to address the potential presence of unknown or undocumented underground utilities, therefore, the area to be excavated must also be evaluated by the PM to determine if the potential for unknown or undocumented underground utilities exist. If the determination is made that the presence of these unknown or undocumented underground utilities is unlikely, then a variance should be requested to eliminate the requirement to identify them.

A list of vendors providing locating and marking services can be found in the *"Network of Underground Damage Prevention Professionals"* which can be accessed on the Internet at the *"Underspace"* WebPage (http://underspace.com/index.htm).

- Variance to this requirement above must be approved by the PM and PESM.

5.2.1.4 Self-Performance of Utility Locating and Marking

The techniques and instruments used to locate and characterize underground utilities can be extremely complicated and difficult to use effectively. Additionally, interpretation of the data generated by this instrumentation can be difficult. The utility marking services described in 5.2.1.1 and 5.2.1.2 are staffed by well-trained, experienced professionals who perform locating activities on a regular basis. For these reasons, it is most desirable that these professional services are used for utility location and marking on projects.

- In some instances, such as long-term projects where excavation is a primary task, and the presence of underground utilities is extensive, it may be prudent to self-perform locating and marking activities.
- If locating and marking is to be self-performed, all personnel using instrumentation will be trained on the use of the equipment that will be used, and the interpretation of the data.
- There are variety of locating methods which may be utilized for self-performance of utility locating as categorized below:
- Magnetic field-based locators or path tracers
- Buried electronic marker systems (EMS)
- Ground penetration radar-based buried –structure detectors
- Acoustics-based plastic pipe locators
- Active probes, beacons, or sondes for non-metallic pipes
- Magnetic polyethylene pipe
- Before self-performing any underground utility locating on a project, approval must be obtained from the TtEC Director, EHS Services.

5.2.2 Working Near or Around Underground Utilities

After the site has been properly evaluated for the presence of underground utilities, intrusive activities may begin. Since there is no perfect way of eliminating the hazards presented by underground utilities, an effort must be made to perform the tasks following the direction and guidance as described by the following best practices that should be implemented during the execution of the project.

5.2.2.1 Work Site Review

Before beginning intrusive activities, a meeting shall be held between all members of the project team. This shall consist of a review of the marked utility locations with the equipment operators, observers, laborers, etc.

5.2.2.2 Preservation of Marks

During excavation, efforts must be made to preserve the markings placed by the utility owners until they are no longer required. If any markings are obliterated, the One-Call agency must be contacted for re-marking. No intrusive activities are to take place if markings are not visible.

5.2.2.3 Excavation Observer

Whenever intrusive operations are being conducted within four feet of the edge of the buffer zone, an observer must be assigned to monitor the activities. The observer will be designated each day, and a review of hand signals and other forms of communication between the observer and operator will be conducted. The directives of the observer will be followed precisely and immediately by those operating equipment.

5.2.2.4 Excavation Within The Buffer Zone

Performing intrusive activities within the buffer zone requires careful adherence to proper guidelines and procedures to minimize the risk of contact with underground utilities.

The purpose of the buffer zone is to designate and define an area where careful, prudent, and reasonable excavation practices are to be used to prevent contact with underground utilities. However, there may be occasions where it is necessary to perform aggressive excavation methods in this designated area.

The boundaries of the buffer zone as defined in Section 4.1 will be observed at all times during intrusive activities. Aggressive excavation methods (excavators, backhoes, drill rigs) must be restricted to areas outside of the 4-foot buffer zone unless a special exemption to this requirement is obtained.

Consider whether the objective of the project can be completed without performing intrusive activities in the buffer zone at all. This will greatly reduce the risks presented by performing work in close proximity to underground utilities. If after consideration, the determination is made that intrusive activities in the buffer zone are necessary, then a formal exemption request shall be made to the PESM according to the guidelines below.

A request to utilize aggressive excavation methods in the buffer zone may be made if:

- There is no other appropriate and reasonable alternative to using aggressive methods in the buffer zone; and
- The utility has been de-energized (and purged if necessary), verified as de-energized, and locked-out (per Section 5.2.2.6); or

- the depth and orientation of the utility has been adequately and visually determined through the use of non-aggressive methods such as air/hydro/vacuum excavation, potholing, probing, hand-digging, or a combination thereof; and

- for utilities containing electrical energy, the depth of the existing water table is below the location of the utility; and
- application for the exemption has been submitted to the PESM via a Field Change Notification (FCN); and
- the exemption has been granted and approved in writing by the PESM on the FCN form.

The following conditions will apply to this request:

- Aggressive methods may be used in the buffer zone only to the extent allowed by the applicable state or other jurisdictional regulations.
- Appropriate physical protection measures for exposed utilities as described in Section 5.2.2.5 shall be implemented to eliminate the potential for equipment contact with utilities.
- The extent of the project excavation area to be covered by the exemption request must be specified in the FCN.
- When evaluating the use of aggressive excavation methods in the buffer zone, the PESM will consider the type of utility involved and the associated risk potential.

Based on this evaluation, the PESM may impose further conditions and requirements, which will be detailed in the FCN.

Even if the above exemption conditions are met, the PESM has authority to deny the request, the reasons for which will be described in the FCN.

Unless exempted according to the above provisions of this procedure, only non-aggressive methods may be

used within the buffer zone. Non-aggressive, or non-mechanized equipment is used in order to prevent mechanical contact with underground utilities which could result in damage to the utility and create the potential for personal injury and property damage. Following are examples of non-aggressive excavation methods:

- Hand-digging
- Non-conductive hand tools must be used when digging within the buffer zone surrounding underground electrical utilities.
- If conductive hand tools must be used near electrical lines, then the PESM shall be consulted to determine additional requirements relative to safe electrical practices, procedures, and equipment.
- Hydro-excavation (water pressure).
- Air excavation (air pressure).
- Vacuum extraction (soil excavation/removal).
- Air excavation/vacuum extraction combination.
- Aggressive methods may be used for the removal of pavement over a utility, if allowed by the state regulations.

5.2.2.5 Protection of Underground Utilities

It is very important that consideration be given to the protection of underground utilities when performing adjacent intrusive activities. This is necessary not only to prevent physical damage and associated indirect effects, but also to prevent the potential for injury to employees and the public.

- When using aggressive excavation methods within the buffer zone around exposed underground utilities, physical protection may be appropriate. Basically, this involves creation of a physical barrier between the mechanized operation and the utility. The following are some possible types of physical protective measures:
- Heavy timbers, similar to swamp mats.
- Sheets of plywood.
- Blasting mats.
- Once exposed, underground utilities no longer have the support provided by surrounding soil and may need to be physically supported to prevent shifting, bending, separation, or collapse, which could result in damage to the utility, and possibly personnel. Following are suggested support methods:
- Timber shoring underneath the utility.
- Timbers or girders over the top of the excavation fitted with hangers that support the utility.
- Design by a PE for complicated or large applications.
- Utilities must also be protected from objects that may fall into the excavation such as rocks and equipment. This can be accomplished by following these guidelines:
- Cast spoils as far away from the excavation as possible. Excavated and loose materials shall be kept two feet from the edge of excavations, as required by OSHA.
- Relocate large rocks, cobbles, and boulders away from the excavation and sloped spoils piles.
- When vehicles and machinery are operating adjacent to excavations, warning systems such as soil berms, stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling into the excavation.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

5.2.2.6 De-Energizing Utilities

Utilities can carry many types of potential energy, including electricity, flowing liquids, liquids under pressure, gasses under pressure, etc. A release, such as may happen if a utility conveyance is compromised, could result in personal injury, property damage, and other indirect effects. If the white lines of the proposed excavation area overlaps or extends into the buffer zone of a known underground utility, then if at all possible, that utility shall be de-energized to physically prevent the transmission, flow, or release of energy. Conversely, if the buffer zone of the known utility lies outside of the white-lined, proposed excavation area, then de-energization is not required.

- The owner of the utility shall be contacted to determine the feasibility and methodology of de-energizing the utility. Plenty of lead-time should be provided for this since it may take utility companies weeks to de-energize some utilities.
- Depending on the utility and the material being conveyed, isolation points which may be suitable for de-energizing include but are not limited to the following:
- Electrical circuit breakers
- Slide gate

- Disconnect switches
- Piping flanges
- Other similar devices
- When utilities are de-energized, it must be verified by demonstration. This can be accomplished by testing equipment, switching on a machine or lighting, opening a valve, etc. For any current-carrying electrical equipment, such as cables, electrical panels, etc., successful de-energization must be certified through the use of appropriate electrical testing equipment.
- Whenever a utility is de-energized, a means of ensuring that the energy isolation device and equipment cannot be operated until the device is removed must be provided. Typically, this is achieved by utilizing a lockout device, accompanied by a written tag, that physically controls the configuration of the energy isolation point. Lockout devices include but are not limited to the following:
- Locks
- Chains
- Valve covers
- Circuit breaker hasps
- Blind flanges
- Slip blinds, and
- Multiple lock hasps
- When de-energizing and locking out of utilities is practiced, the provisions of EHS 6-4 Lockout/Tagout, shall be followed, as applicable.
- In the event that a utility is de-energized, but there is no means of adequately providing a physical locking-out of the utility, then a spotter must be posted at the point of isolation to ensure that the utility is not re-energized. The spotter must be supplied with a communication device such as a site radio.

5.2.2.7 Damage Discovery

During excavation, utility damage may be discovered which is pre-existing or otherwise not related to a known contact. Disclosure to the utility owner is very important because the possibility of utility failure or endangerment of the surrounding population increases when damage has occurred. The utility may not immediately fail as a result of damage, but the utility owner or operator must be afforded the opportunity to inspect the utility and make a damage assessment and effect repairs if necessary. The following guidance applies:

- Observe and photograph the utility from a safe distance and determine in there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, or other damages to utility lines, conduits, coatings, or cathodic protection systems.
- The One-Call agency or private location service must be contacted immediately.

5.2.3 Encountering or Contacting Underground Utilities

In the event that encountering or contacting an underground utility occurs, it is imperative that the appropriate actions are taken to minimize damage to the utility, prevent personal injury, and minimize indirect effects.

5.2.3.1 Encountering Underground Utilities

It is possible that underground utilities will be encountered in locations that have previously been “cleared” of having underground utilities by the locating service, or are found outside of the area which has been marked as having underground utilities. In either case, if this occurs, the following applies:

- Intrusive activities must be curtailed
- The One-Call agency or private location service must be contacted immediately
- The PM and PESM must be notified
- No further intrusive activities may be conducted until:
- The One-Call agency/private location service and/or the subject utility owner visit the site;
- Identification of the utility owner and the type of material/energy being conveyed by the utility has been made; and
- The orientation and depth of the subject utility has been determined and suitably marked.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.

5.2.3.2 Contacting Underground Utilities

If excavation or other equipment being used for intrusive activities makes contact with an underground utility, the following guidelines apply:

- Intrusive activities must be stopped immediately.
- Observe the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, scratched coatings, cathodic protection compromise, material leakage, obvious electrical energy.
- Move all personnel to the evacuation meeting point as described in the SSHP.

EXCEPTION: If an electrical line has been contacted and it is your belief that equipment (such as an excavator) is electrically energized, do not approach the equipment. Order the operator to remain in the equipment until emergency personnel can de-energize the source (unless the equipment is on fire, at which time the operator should jump off of the vehicle and shuffle along the ground to a safe area). Shuffling is required because current flows outward through the soil in a ripple pattern called a power gradient, creating a pattern of high and low potential, Shuffling decreases the chance that these gradients could be bridged, causing current to flow through the body, resulting in electrocution.

- Secure the area to prevent the public from entering.
- Contact emergency responders as specified in the SSHP.
- The One-Call agency or if known, the utility owner must be contacted immediately.
- The PM and PESM must be notified.
- No further intrusive activities may be conducted until:
- The utility owner inspects the scene and after repairs, verifies that all danger has passed.
- The orientation and depth of the subject utility has been determined and suitably marked.
- Permission from the emergency responders to resume work has been given.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.
- State and Local regulations must be reviewed to determine if reporting to any additional agencies is required.

5.3 Training

Competent Persons shall have adequate experience and/or training to carry out the requirements of this procedure.

6.0 SOURCES OF INFORMATION

6.1 Organizations

- Common Ground Alliance
- Center for Subsurface Strategic Action (CSSA)
- DigSafely
- National Utility Contractors Association (NUCA)
- National Utility Locating Contractors Association (NULCA)
- Underground Focus Magazine
- NUCA State Listing of One-Call centers
- Utility Safety Magazine

6.2 Vendors and Commercial Sites

- RadioDetection, Inc. (Detection Instruments)
- Heath Consultants (Detection Instruments)
- Ben Meadows Company (Detection Instruments)
- So-Deep, Inc. (Complete Utilities Services)
- Concept Engineering Group, Inc. (Air Excavation Equipment)
- Rycom Instruments, Inc. (Detection Instruments)
- Schonstedt Instrument Company (Detection Instruments)
- Forestry Suppliers, Inc. (Fiberglass Probe – "Fiberglass Tile Probe", Part #77543, Approx. $20.00, Telephone 800-647-5368)

7.0 REFERENCES

- Common Ground Study of One-Call Systems and Damage Prevention Best Practices, August, 1999, Sponsored by US DOT.

8.0 ATTACHMENTS

Attachment A – Underground Utilities Locating and Marking Checklist
Attachment B – Underground Utilities Management Checklist

ATTACHMENT 1
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITIES LOCATING AND MARKING CHECKLIST

Click the icon below to launch or download.

Underground UtilitiesAttachA 04 03 03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

ATTACHMENT 2
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT B
UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

Click the icon below to launch or download.

Underground UtilitiesAttachB 04 03 03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITY LOCATING AND MARKING CHECKLIST

TETRA TECH EC, INC.

To be Completed by PM and/or "Competent Person"
Complete Form as Location/Marking Progresses and Maintain in Site Files

PROJECT INFORMATION:	Location:
Project Name:	Task/Activity:
Tetra Tech EC Competent Person:	Start Date of Work:
Tetra Tech EC Subcontractor: ☐ No ☐ Yes:	Private Locating Service Required: ☐ Yes ☐ No
Property Owner:	If Not, Explain:
NOTIFICATION:	
Locating Service Name:	Locating Service Tel. Number:
Date Locating Service Notified:	Locate Ticket Number:
Address of Property to be Marked:	Locate Ticket Expiration Date:
Nearest Intersecting Street:	
Are There Any Utilities on the Properties That the Locating Service Will Not Contact? ☐ Yes ☐ No	
Specify:	
Enter Utility Information in Table 1 Below. In Addition to Utility Locating Services, Consult Client, Utility Owners, Drawings, Facility Personnel, Maintenance Personnel, Municipalities, etc.	

TABLE 1
ON-SITE UTILITY INFORMATION

NAME OF UTILITY COMPANY	TYPE OF UTILITY	COLOR CODE	UTILITY PRESENT ON-SITE?	EMERGENCY PHONE NUMBER	DATE MARKS COMPLETED
	Electric	RED			
	Communications, Phone, CATV	ORANGE			
	Gas, Oil, Steam, Petroleum	YELLOW			
	Sewers, Drains	GREEN			
	Potable Water	BLUE			
	Reclaimed Water, Irrigation	PURPLE			
	Temporary Survey Markings	PINK			
To be performed by excavator prior to utility mark-out.	Proposed Excavation	WHITE			

White-Lining Completed? ☐ No Explain: _____ ☐ Yes: Date: _____ By Whom? _____

LOCATING AND MARKING:

Have All Utilities Identified in Table 1 Been Marked? ☐ Yes ☐ No (If Not, Contact Locating Service for Resolution)
Problem(s) With Markings?
☐ Yes ☐ No ☐ No Marks ☐ Incorrect Location ☐ Too Wide
☐ Other: _____ ☐ Not All Utilities Marked Per Table 1 (notify marking service)
Measurements Taken: ☐ Yes ☐ No
Documentation of Marks: ☐ Photos ☐ Video ☐ Other: _____

EXCAVATION:

Utilities Accurately Marked? ☐ Yes ☐ No
If no, describe: _____
Were Unmarked or Mis-Marked Utilities Encountered? ☐ Yes ☐ No
If Yes, Specify: _____
Locating Service Notified? ☐ Yes ☐ No
Will Excavation Continue Past Locate Number Expiration? ☐ Yes ☐ No
If Yes, Locate Number Renewed? ☐ Yes ☐ No New Expiration Date: _____
Any Other Problems/Concerns? Specify: _____

Form Completed By:	Signature:	Date:

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

TETRA TECH EC, INC.

To be Completed by PM and/or "Competent Person"
Complete Form as Project Progresses and Maintain in Site Files.

PHASE		TASK	YES	NO	NA	COMMENTS Required if Response is No or NA. (Reference Item Number)
Pre-Planning	1.	Excavation in Work Scope? (As defined in EHS 3-15, Section 4.4)				
	2.	Underground Utilities Identified in TIP?				
	3.	Competent Person Assigned?				
	4.	Has a Copy of the Applicable State Regulations Been Obtained, Read, Understood?				
	5.	EHS Plan Addresses Underground Utilities? (AHAs, Contingency Plan, State Regulations Appendix)				
Identifying, Locating and Marking	6.	Locating and Marking Checklist Initiated? (Attachment A)				
	7.	Identification and Address of Property Determined, Including Nearest Intersection?				
	8.	One-Call Agency Contacted?				
	9.	Additional Locating and Marking Required on Property? (One-Call agency marks to public property line only)				
	10.	Additional Marker/Locator Identified?				
	11.	Additional Marker/Locator Qualified?				
	12.	TtEC Self-Performing Location and Marking?				
	13.	If Yes to 12 Above, Approval From TtEC Director EHS Services?				
	14.	Area of Excavation "White-Lined" by TtEC?				
	15.	TtEC Present When Markings Completed?				
	16.	All Utilities Marked? (Refer to Attachment A, Table 1)				
	17.	All Markings Photo/Video Documented?				
	18.	Area Checked for Signs of Previous Excavation? (subsidence, new grass, patching, etc)				
	19.	All Applicable Information Recorded on Attachment A?				
	20.	Multiple Contractors Excavating On-Site?				
	21.	Separate Locate Requests for All Contractors?				
	22.	TtEC Subcontractors Excavating in TtEC White-Lined Area(s)?				
	23.	If Yes to 22 Above, One-Call Agency Contacted to Determine if TtEC Subcontractor Can be Added to Existing Locate Ticket?				
Excavation Activities	24.	Meeting and Site Walk-Over Conducted with Project Personnel? (Managers, Equipment Operators, Laborers, Competent Person, Excavation Observer, etc)				
	25.	AHA and EHSP Review Conducted With Personnel?				
	26.	Do Site Activities Have Potential to Obliterate Utility Markings?				
Excavation Activities – Cont'd	27.	If Yes to 26 Above, Have Provisions Been Made to Preserve Markings?				

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE		TASK	YES	NO	NA	COMMENTS Required if Response is No or NA. (Reference Item Number)
	28.	Has an Excavation Observer Been Designated to Monitor Excavation When Occurring within 4 Feet of the Buffer Zone?				
	29.	Have Operator and Observer Reviewed Commands and Signals?				
	30.	Has TtEC-Required 4-Foot Buffer Zone Been Marked on Either Side of Markings Placed by Locator?				
Excavation Within Buffer Zone	31.	Is Excavation Within The Buffer Zone Absolutely Necessary?				
	32.	If Yes to 31 Above, Can Non-Aggressive Methods Be Used For Excavation In The Buffer Zone? If Yes, Identify Appropriate Non-Aggressive Methods.				
	33.	If No to 32 Above, Has a Buffer Zone Exemption Request (FCN) Been Approved by The PESM? If No, then Aggressive Methods May Not Be Used in The Buffer Zone.				
	34.	If Yes to 33 Above, Has the Utility Been De-Energized, Purged, Verified/Tested, and Locked-Out? Or, Has The Depth and Orientation of the Utility Been Adequately and Visually Determined Through The Use of Non-Aggressive Methods?				
	35.	If Yes to 34 Above, Have All of The Following Conditions Been Met? For Utilities Containing Electrical Energy, Is The Depth of The Water Table Below The Depth of The Utility? Have Regulations Been Consulted to Determine Specific State Requirements Relative to Excavating in The Buffer Zone? Have Appropriate Physical Protection Measures Been Implemented to Prevent Equipment Contact With Utilities and to Prevent Damage to Utilities? Has The FCN Requesting The Buffer Zone Exemption Been Signed by The PESM? If No to Any of The Above Conditions, Then Only Non-Aggressive Excavation Methods May Conducted in The Buffer Zone, Since The Conditions of The Exemption Have Not Been Satisfied.				
Working Around Exposed Utilities	36.	If Necessary, Have Provisions Been Made to Support the Utility During Work Activities?				
	37.	Have Spoils Been Placed as far Away From the Excavation as Feasible?				
	38.	Has the Utility Been De-Energized? (If Any Portion of the 4-Foot Buffer Zone around a Utility is Inside of the White-Lined Area)				
	39.	Has the Isolation Point for the De-Energized Utility Been Physically Locked-Out?				
Working Around Exposed Utilities –Cont'd	40.	If No to 39 Above, Has a Spotter Been Assigned to Monitor Isolation Point?				
	41.	If Yes to 40 Above, Does the Spotter Have Adequate Communications? (Radio, Telephone, etc)				
	42.	Has the Isolation Point Been Tagged?				
Damage Discovery	43.	Has Pre-Existing Damage to a Utility Been Discovered During Excavation?				
	44.	If Yes to 43 Above, Has the One-Call Agency and/or Utility Owner Been Notified?				
	45.	If Yes to 43 Above, Have Photographs Been taken?				

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE		TASK	YES	NO	NA	COMMENTS Required if Response is No or NA. (Reference Item Number)
Encountering or Contacting Underground Utilities	46.	Have Utilities Been Encountered in Locations That Have Not Been Marked?				
	47.	If Yes to 46 Above, Has the One-Call Agency or Other Locating Service Been Contacted?				
	48.	If Yes to 46 Above, Has the PM and PESM Been Notified?				
	49.	If Yes to 46 Above, Has a TtEC Incident Report per EHS 1-7 Been Completed? (Include Photographs)				
	50.	Has Excavation Equipment Come In Contact With Underground utilities?				
	51.	If Yes to 50 Above, Were Intrusive Activities Immediately Curtailed?				
	52.	If Yes to 50 Above, Has a Damage Determination Been Made From a Safe Distance?				
	53.	If Yes to 50 Above, Has the Area Been Secured?				
	54.	If Yes to 50 Above, Have Emergency Responders Been Notified?				
	55.	If Yes to 50 Above, Has the Locating Agency and/or Utility Owner Been Notified?				
	56.	If Yes to 50 Above, Have State and Local Reporting Requirements Been Met?				
	57.	If Yes to 50 Above, Were Intrusive Activities Curtailed Until; Inspection From Utility Owner, Orientation and Depth of Utility Was Determined and Marked, Permission From Emergency Responders Given?				
	58.	If Yes to 50 Above, Has a TtFW Incident Report per EHS 1-7 Been Completed? (Include Photographs)				

CHECKLIST COMPLETED BY:

NAME	SIGNATURE	DATE
NAME	SIGNATURE	DATE

EHS 6-3 : Excavation and Trenching

Last Revision By: Kennedy Lugo on 11/16/2010
Created By: Lisa Kaminski on 05/14/2001

Purpose:	This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.		
Version Date:	07/03/2001 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Science, Operational Control, Training, Monitoring	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents

1.0 PURPOSE

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P - Excavations.

2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations.

3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

4.0 DEFINITIONS

4.1 Benching

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

4.2 Competent Person

A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

4.3 Excavation

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

4.4 Hazardous Atmosphere

An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

4.5 Protective Systems

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

4.6 Sloping

A method of protecting employees from cave-ins by forming sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

4.7 Support System

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

4.8 Trench

A narrow excavation made below the surface of the ground. In general the depth is greater than the width, but the width of a trench measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Competent Person

The competent person(s) shall be responsible for:

- Day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- Selection of protective systems
- Conducting daily inspections of open excavations and trenches; and
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

5.1.2 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure
- Providing the necessary resources for compliance with this procedure; and
- Designating competent personnel in consultation with the Project Environmental, Health and Safety Manager (PESM)

5.1.3 Environmental, Health and Safety Personnel

The ESS shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure
- Conducting periodic reviews of open trenches and excavations
- Consulting with the project manager and competent person on excavation issues; and
- Maintaining required records.

5.2 Designation of Competent Personnel

Prior to the start of any excavation work the project manager shall designate a competent person to fulfill the requirements of this procedure.

5.3 General Requirements

The following section provides general requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems.

- Surfaces surrounding open trenches and excavations shall have all surface hazards removed.
- All utilities shall be located and cleared prior to initiating digging. Public or facility utility groups shall be utilized where possible for this purpose. In the absence of either, the ESS shall specify the procedures to be used to clear utilities in consultation with the project PESM and project manager. When the excavation is open, utilities shall be supported and protected from damage. Clearance and support methods shall be documented on the daily inspection checklist.
- Where structural ramps are used for egress they shall be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps shall be provided as means of egress in all trenches 4 feet or more in depth. Travel distance shall be no more than 25 feet between means of exit.
- Employees exposed to vehicular traffic shall wear traffic vests.
- No employee shall be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations warning systems such as stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling on employees.
- Excavated and loose materials should be kept at least 3 feet from the edge of excavations, but at a minimum

of 2 feet from the edge of the excavation in accordance with OSHA requirements.

- Walkways or bridges with standard railing shall be provided at points employees are to cross over excavations or trenches.

- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

5.4 Hazardous Atmospheres

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist the following requirements shall be implemented.

- Atmospheric testing shall be done prior to employees entering excavations 4 feet or greater in depth.

- Testing methods shall be listed on the daily inspection checklist and results documented daily in field logs.

- Control measures such as ventilation and personal protective equipment (PPE) shall be used to control employee exposure to hazardous atmospheres below published exposure limits.

- Ventilation shall be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.

- Testing shall be repeated as often as necessary to ensure safe levels of airborne contaminants.

- Emergency equipment shall be provided and attended when the potential for a hazardous atmosphere exists. This equipment shall include but not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.

5.5 Protection From Water Hazards

When water has collected or is collected in excavations and trenches the following requirements shall be applied.

- Employees shall not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal.

- Water removal shall be monitored by a competent person.

- Barriers such as ditches and dikes shall be used to divert runoff from excavations and trenches.

- Trenches shall be reinspected prior to re-entry after water accumulation due to heavy rainfall or seepage.

5.6 Stability of Adjacent Structures

When excavating or trenching near an adjacent structure the following practices shall be implemented.

- Support systems such as shoring, bracing, or underpinning shall be provided where the stability of buildings, walls, or other structures is endangered by excavation.

- Excavation bases or footings of foundations shall be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined the structure is sufficiently removed from the site as to not pose a hazard, or the PE determines that the excavation shall not pose a hazard to employees due to the structure.

- Support systems shall be used when it is necessary to undermine sidewalks, pavements, and appurtenant

structures.

- Surcharge load sources and adjacent encumbrances shall be listed with their evaluation date on the daily inspection checklist.

5.7 Daily Inspections

Inspections shall be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in Attachment A or equivalent shall be used.

5.8 Soil Classification

To perform soil classification, the competent person shall use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (i.e., one soil type mixed with another within a given area) several tests may be necessary. When different soil types are present the overall classification shall be that of the type with the lowest unconfined compressive strength. Classifications shall result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications shall be listed on the daily inspection checklist. The soils analysis checklist provided in Attachment B or equivalent shall be used for soil classifications.

5.9 Sloping and Benching

All sloping and benching shall be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the sloping method and evaluation of surface surcharge loads shall be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications shall be listed on the daily inspection checklist.

5.10 Protective Systems

Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a competent person reveals conditions that may result in cave-ins.

Selection and installation of protective systems shall be done in accordance with 29 CFR 1926.652, Appendices C & D, or manufacturers data for shoring and shielding systems. Selection of a protective system shall be made based upon soil classification and job requirements by a competent person. Protective systems and specifications shall be listed on the daily inspection checklist.

5.11 Training

Competent persons shall have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a competent person shall be documented and include the following:

- General safety practices related to working in or near open excavations;
- Inspection requirements and techniques;
- Classification of soils in accordance with 29 CFR 1926.652, Appendix A; and

- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

6.0 REFERENCES

29 CFR 1926, Subpart P, Excavations.
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration),

7.0 ATTACHMENTS

Attachment A - Daily Excavation Inspection Checklist
Attachment B - Soils Analysis Checklist

EHS 6-3 ATTACHMENT A
DAILY EXCAVATION INSPECTION CHECKLIST

Click the icon below to launch or download.

EHS 6-3 Attachment A 04-03-03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 6-3 ATTACHMENT B
SOILS ANALYSIS CHECKLIST

Click the icon below to launch or download.

EHS 6-3 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 6-3 ATTACHMENT A

TETRA TECH EC, INC.

DAILY EXCAVATION INSPECTION CHECKLIST

To be completed by a "Competent Person"

Site location _____

Date _____ Time _____ Competent Person _____

Soil Type(s) _____

Soil Classification(s) _____ Excavation depth _____ Excavation width _____

Type of protective system used _____

Indicate for each item by circling: Y (Yes), N (No), - Address in Comments, Not Applicable (N/A.)

I.	**General Inspection of Job Site**			
A.	Surface encumbrances removed or supported	Y	N	N/A
B.	Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation	Y	N	N/A
C.	Hard hats worn by all employees	Y	N	N/A
D.	Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation	Y	N	N/A
E.	Barriers provided at all remotely located excavations, wells, pits, shafts, etc.	Y	N	N/A
F.	Walkways and bridges over excavations 4 feet or more in depth are equipped with standard guardrails	Y	N	N/A
G.	Warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic	Y	N	N/A
H.	Warning system established and utilized when mobile equipment is operated near the edge of the excavation	Y	N	N/A
I.	Employees prohibited from working on the faces of sloped or benched excavations above other employees	Y	N	N/A
II.	**Utilities**			
A.	Utility companies contacted and/or utilities located	Y	N	N/A
B.	Exact location of utilities marked when approaching the utilities	Y	N	N/A
C.	Underground installations protected, supported or removed when excavation is open	Y	N	N/A
III.	**Means of Access and Egress**			
A.	Lateral travel to means of egress no greater than 25 feet in excavations 4 feet or more in depth	Y	N	N/A
B.	Ladders used in excavations secured and extended 3 feet above the edge of the trench	Y	N	N/A
C.	Structural ramps used by employees designed by a competent person	Y	N	N/A
D.	Structural ramps used for equipment designed by a registered professional engineer (RPE)	Y	N	N/A
E.	Ramps constructed of materials of uniform thickness, cleated together on the bottom, equipped with a no-slip surface	Y	N	N/A
F.	Employees protected from cave-ins when entering or exiting the excavation	Y	N	N/A

IV.	**Wet Conditions**			
A.	Precautions taken to protect employees from the accumulation of water	Y	N	N/A
B.	Water removal equipment monitored by a competent person	Y	N	N/A
C.	Surface water or runoff diverted or controlled to prevent accumulation in the excavation	Y	N	N/A
D.	Inspections made after every rainstorm or other hazard increasing occurrence	Y	N	N/A
V.	**Hazardous Atmospheres**			
A.	Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard	Y	N	N/A
B.	Ventilation	Y	N	N/A
C.	Testing conducted often to ensure that the atmosphere remains safe	Y	N	N/A
D.	Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmospheres could or do exist	Y	N	N/A
E.	Safety harness and life line used and individually attended when entering deep confined excavations	Y	N	N/A
VI.	**Support Systems**			
A.	Materials and/or equipment for support systems selected based on soil analysis, trench depth and expected loads	Y	N	N/A
B.	Materials and equipment used for protective systems inspected and in good condition	Y	N	N/A
C.	Materials and equipment not in good condition have been removed from service	Y	N	N/A
D.	Damaged materials and equipment used for protective systems inspected by a RPE after repairs and before being placed back into service	Y	N	N/A
E.	Protective systems installed without exposing employees to the hazards of cave-ins, collapses or from being struck by materials or equipment	Y	N	N/A
F.	Members of support system securely fastened to prevent failure	Y	N	N/A
G.	Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.	Y	N	N/A
H.	Excavations below the level of the base or footing approved by an RPE	Y	N	N/A
I.	Removal of support systems progresses from the bottom and members are released slowly as to note any indication of possible failure	Y	N	N/A
J.	Backfilling progresses with removal of support system	Y	N	N/A
K.	Excavation of material to a level no greater than 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth	Y	N	N/A
L.	Shield system placed to prevent lateral movement	Y	N	N/A
M.	Employees are prohibited from remaining in shield system during vertical movement	Y	N	N/A

VII. Comments

EHS 6-3 ATTACHMENT B

TETRA TECH EC, INC.
SOILS ANALYSIS CHECKLIST

This checklist must be completed when soil analysis is made to determine the soil type(s) present in the excavation. A separate analysis must be performed on each layer of soil in excavation walls. A separate analysis must also be performed if the excavation (trench) is stretched over a distance where soil type may change.

Site location: _____

Date: _____ Time: _____ Competent Person _____

Where was the sample taken from? _____

Excavation: Depth: _____ Width: _____ Length: _____

VISUAL TEST

Particle type: ___ Fine Grained (cohesive) ___ Course grained (sand or gravel)

Water conditions: ___ Wet ___ Dry ___ Surface water present ___ Submerged

Previously disturbed soils? ___ Yes ___ No

Underground utilities? ___ Yes ___ No

Layered soils? ___ Yes ___ No

Layered soil dipping into excavation? ___ Yes ___ No

Excavation exposed to vibrations: ___ Yes ___ No

Crack-like openings or spallings observed? ___ Yes ___ No

Conditions that may create a hazardous atmosphere? ___ Yes ___ No

If yes, identify condition and source: _____

Surface encumbrances: ___ Yes ___ No

Work to be performed near public vehicular traffic? ___ Yes ___ No

Possible confined space exposure? ___ Yes ___ No

MANUAL TEST

Plasticity: ___ Cohesive ___ Non-cohesive

Dry Strength: ___ Granular (crumbles easily) ___ Cohesive (broken with difficulty)

EHS 6-3 ATTACHMENT B
SOILS ANALYSIS CHECKLIST

NOTE: The following unconfined compressive strength tests should be performed on undisturbed soils.

THUMB TEST (used to estimate unconfined compressive strength of cohesive soil)

Test performed:___ Yes ___ No

___ Type A (soil indented by thumb with very great effort)

___ Type B (soil indented by thumb with some effort)

___ Type C (soil easily penetrated several inches by thumb with little or no effort). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

PENETROMETER OR SHEARVANE (used to estimate unconfined compressive strength of cohesive soils)

Test performed:___ Yes ___ No

___ Type A (soil with unconfined compressive strength of 1.5 tsf or greater)

___ Type B (soil with unconfined compressive strength of 0.5 tsf to 1.5 tsf)

___ Type C (soil with unconfined compressive strength of 1.5 tsf or less). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

WET SHAKING TEST (used to determined percentage of granular and cohesive materials). Compare results to soil textural classification chart to determine soil type.

Test performed ___ Yes ___ No

___ Type A (clay, silty clay, sandy clay, clay loam, and in some cases silty clay, loam and sandy clay loam)

___ Type B [angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam

___ Type C(granular soil including gravel, sand and loamy sand)

___ % granular ___ % cohesive ___ % silt

NOTE: Type A -- no soil is Type "A" if soil is fissured; subject to vibration; previously disturbed; layered dipping into the excavation on a slope of 4H:1V.

SOIL CLASSIFICATION

___ Type A

___ Type B

___ Type C

SELECTION OF PROTECTIVE SYSTEM

___ Sloping, Specify angle:

___ Timber Shoring

___ Aluminum Hydraulic Shoring

NOTE: Although OSHA will accept the above tests in most cases, some states will not. Check your state safety requirements for trenching regulations.

PP-14 : Substance Abuse Program (Previously Drug and Alcohol Abuse)

Last Revision By: Darlene Mininni on 11/09/2010
Created By: Procedures Temp on 04/22/2009

Purpose:	To define Tetra Tech EC, Inc. and its subsidiaries' policy and procedures regarding drug and alcohol abuse. This procedure fulfills the requirements of FAR 23.5, Drug-Free Workplace and the DOE Workplace Substance Abuse Program, DEAR 970.5204-58.		
Version Date:	04/22/2009 - Revised	**Original Issue Date:**	10/07/97
Category:	Company Procedures	**Sections:**	Personnel Practices
Sub Category:	Personnel Practices	**Document Type:**	Procedure
Keyword Index:	Staffing/Personnel	**Document Owner:**	Jackie Rollins
Approved By:			

Table of Contents

Section

1.0 PURPOSE

To define Tetra Tech EC, Inc. and its subsidiaries' policy and procedures regarding drug and alcohol abuse. This procedure fulfills the requirements of FAR 23.5, Drug-Free Workplace and the DOE Workplace Substance Abuse Program, DEAR 970.5204-58.

2.0 SCOPE

This procedure applies to all employees of TtEC and its subsidiaries.

3.0 MAINTENANCE

The Vice President of Human Resources is responsible for updating this procedure. Approval authority rests with the TtEC and its subsidiaries President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Vice President and Chief Financial Officer.

4.0 DEFINITIONS

4.1 Employee

For purposes of this procedure the term “employee” means all full-time and part-time staff, and all job shoppers, temporary agency personnel, subcontractors, vendors, etc., who have access to the Company’s premises to fulfill the requirements of their assignments. (Note: Subcontract and Vendor personnel shall be required to comply with this procedure in the terms of their contract).

4.2 Controlled Substance (Illegal Drug)

Illegal Drug means a controlled substance, as specified in Schedules I through V of the Controlled Substances Act, 21 U.S.C. 811, 812, and as further defined in regulation at 21 CFR 1308.11-1308.15. The term “illegal drugs” does not apply to the use of a controlled substance in accordance with the terms of a valid prescription, or other uses authorized by law. (10 C.F.R. 707.4) Testing as required by this procedure shall at a minimum test for the use of the following classes of drugs: marijuana, cocaine, opiates, phencyclidine, and amphetamines.

4.3 Occurrence

Occurrence means any event or incident that is a deviation from the planned or expected behavior or course of events in connection with any Client, Department of Energy (DOE), or DOE-controlled operation, if the deviation has environmental, public health and safety, or national security protection significance. Incidents having such significance include the following, or incidents of a similar nature:
1. Injury or fatality to any person involving actions of a Company employee.

2. Involvement of nuclear explosives under DOE jurisdiction which results in an explosion, fire, the spread of radioactive material, personal injury or death, or significant damage to property.

3. Accidental release of pollutants which results or could result in a significant effect on the public or environment.

4. Accidental release of radioactive material above regulator limits.

4.4 Reasonable Suspicion

A reasonable suspicion of illegal drug use or alcohol abuse may be based upon the following; or similar circumstances:

a. Observable phenomena, such as direct observation of the use or possession of illegal drugs; or the physical symptoms of being under the influence of drugs or alcohol;
b. A pattern of abnormal conduct or erratic behavior;
c. Arrest for a conviction of a drug related offense, or the identification of an individual as the focus of a criminal investigation into illegal drug possession use, or trafficking;
d. Information that is either provided by a reliable and credible source or is independently corroborated;
e. Evidence that an employee tampered with a drug test or the temperature of the urine specimen is outside the range of 32.5 – 37.7 degrees centigrade or 90.5 – 99.8 degrees Fahrenheit.

4.5 Rehabilitation

Rehabilitation means a formal treatment process aimed at the resolution of behavioral-medical problems, including illegal drug use and alcohol abuse, and resulting in such resolution.

5.0 DISCUSSION

5.1 Policy

The unlawful manufacture, distribution, dispensing, possession, sale, or use of an illegal drug is prohibited in the Company's workplace (including company-owned or client provided premises and vehicles).
The Company is committed to maintaining a workplace free of substance abuse and illegal drugs. As a condition of employment, or as a condition to gain access onto Company work premises, all employees are required to consent to alcohol and/or drug screening as covered in this procedure. Compliance with this procedure by vendor and subcontractor personnel shall be required by the terms of their subcontract with the Company.
Any employee found to be in violation of this procedure is subject to disciplinary action, up to and including termination.

5.2 Responsibilities

5.2.1 All Employees

All employees are responsible for each of the following:
a) Abiding by the terms of this procedure as a condition of employment. Applicants are required to execute the Company form authorizing illegal drug testing (see Attachment 1). In unusual and compelling circumstances where an applicant commences employment before the results of the drug test are available, the applicant is required to execute a Pre-Employment Test Agreement (see Attachment 2). Failure to execute these required forms, when applicable, shall cause the applicant to be ineligible for employment with the Company; and

b) Reporting to their supervisor the use of prescription drugs which may impair or affect the employees' alertness, coordination, or ability to perform their jobs properly and safely; and

c) Reporting any suspected or actual violations of this procedure to their supervisor, other management personnel, the Human Resources department, or the Compliance Hot Line at 1-800-886-2577. (See Company Procedure PP-18, Compliance Hot Line, for more information.)

d) Notifying the Company in writing within five days of being convicted of a violation of a criminal drug statute for a violation occurring in the work-place.

5.2.2 Supervisors and Line Managers

Supervisors and Line Managers are required to:

a) Notify promptly the Human Resources department and local law enforcement authorities in the event substances are found which are believed to be illegal drugs; and

b) Notify the Administration and Compliance department of any notice of conviction reported by employees as required by this procedure and coordinate with the Administration and Compliance department to provide the required notice to the appropriate federal government Contracting Officer and/or Security Officer within 10 days of receiving such written notice from the employee; and

c) Complete Company-provided training to enable the supervisor to recognize deteriorating job performance or judgment, or unusual conduct, which may be the result of possible illegal drug use; and

d) Intervene when there is deterioration in performance, or observed unusual conduct in an employee under their supervision. In conjunction with the Human Resources department as appropriate, supervisors may offer alternative courses of action that can assist the employee in returning to satisfactory performance, judgment, or conduct, including referral to outside agencies as appropriate. (Note that nothing in this procedure obligates the Company or any client to pay the costs of nor to offer any individual counseling, rehabilitation, or treatment.) Supervisors shall coordinate all such referrals through the internal Employee Assistance Program implemented by the Human Resources department and shall take appropriate measures to protect the privacy of employees.

5.2.3 Human Resources Department

The Human Resources department has the following responsibilities:

a) Training Program – The Human Resources department shall provide training to supervisors and

communication to employees regarding the problems of substance abuse, including illegal drug use, the availability of referrals to other resources for assistance, and the penalties that may be imposed upon employees for drug-related violations and/or violation of this procedure. Such training shall emphasize preventive measures.

b) As part of the training program, ensure that all new employees, including craft employees, are provided a copy of this procedure. (Note the DOE requires the notice to contain essentially everything in this procedure)

c) Pre-employment Screening – The Human Resources department shall implement and maintain a program to ensure pre-employment drug screening in accordance with this procedure of all applicants. (required for DOE contracts – designated positions)

d) Random or Occurrence Based Drug Testing – The Human Resources department shall initiate random drug testing or for cause testing (i.e., occurrence based or suspicion based) when required to comply with DOE regulations, this procedure, and/or as otherwise deemed necessary by Executive Management.

e) Employee Assistance Program – Tetra Tech offers all employees the opportunity to utilize services provided through our EAP. A description of services is described in our benefits material. The number to contact our EAP service is 800-662-7241.

f) Employee Privacy – In implementing the above programs, the Human Resources department shall take appropriate measures to protect the privacy interests of employees and applicants.

g) Applicant Documentation – The Human Resources department is responsible for ensuring that the applicable pre-employment forms (Attachments 1 & 2) are executed by the employee before employment commences and are maintained in the employees permanent employment file.

h) Contract for Testing Services – The Human Resources department (using the Company's procurement department and by completing a Purchase Requisition and Scope of Work) is responsible for obtaining contracts with responsible testing services and ensuring that contract terms comply with the requirements of this procedure and 10 CFR §§ 707.12 & 707.13. The Human Resources department has the ongoing responsibility for managing the contract.

5.2.4 Procurement Department

The Procurement department is responsible for:

a) Ensuring that all subcontracts and purchase orders contain the appropriate prime contract flow-down requirements related to drug-free workplace requirements; and

b) Obtaining the appropriate vendor's drug-free workplace programs and providing copies to the Health and Safety department to initiate compliance reviews where such a plan is required by the subcontract terms; and

c) Supporting the Human Resources department by contracting for testing services in accordance with the approved Purchase Requisition and Scope of Work. The Procurement department has the ongoing responsibility for administration of such a contract.

5.2.5 ESQ Department

a) The ESQ Department is responsible for conducting inspections of Subcontractor's programs and implementation thereof to ensure compliance with contract flow-down requirements.

b) The ESQ Department may also initiate for-cause testing.

5.2.6 Administration and Compliance Department

The Administration and Compliance Department is responsible for:

a) Conducting periodic internal audits of the Company Substance Abuse Program to ensure compliance with this procedure, contract requirements, and the applicable federal regulations; and

b) Reviewing all written notices of convictions by employees provided in accordance with this procedure and coordinate with the Program Manager to ensure timely notice (within 10 days) to the appropriate federal government Contracting Officer or Security Officer. In addition, take any steps necessary to suspend an employee's security clearance as required by the applicable federal regulations; and

c) Assisting PMs with all federal government security requirements as detailed in this procedure.

5.3 Substance Abuse Screening

5.3.1 Pre-employment Screening

All prospective employees, typically after receiving an offer, are subject to drug testing for substance abuse in accordance with this procedure. Testing will be at Company expense.
Any prospective employee who refuses to submit to the test, or has positive test results will have the offer revoked.

5.3.2 Reasonable Suspicion or Occurrence Related Screening

As a condition of employment all employees are subject to Company paid drug and/or alcohol tests at anytime the Company has a reasonable suspicion that an employee is using illegal drugs or abusing alcohol; or that an employee could have caused or contributed to an occurrence. In addition to the events or incidences listed in paragraph 4.3, Occurrences, of this procedure, reasonable suspicion may be inferred from an employee's involvement in the following:

1. an incident that results in damage or loss in excess of $5000 to equipment, vehicles, or property, or
2. a near miss, that under different circumstances, could have resulted in an incident such as those listed herein.

Refusal to take a drug test is cause for disciplinary action up to and including termination of employment.

Positive test results are cause for disciplinary action up to and including termination of employment.

5.3.3 Random Sampling

This procedure provides notice that the Company may at any time without further notice initiate random drug and/or alcohol screening, on a company-wide, project by project, or site specific basis. (See Attachment 3 for DOE contract requirements).

5.3.4 Positive Test Results

a) When an applicant for employment has been tested and determined to have used an illegal drug, processing for employment will be terminated and the applicant will be so notified.

b) When an employee has been tested and determined to have used an illegal drug, the employee will be removed from any testing designated position (see Attachment 3) and proper notice shall be provided to government security officials consistent with this procedure. The employee's supervisor and the Vice President of Human Resources shall determine the appropriate disciplinary action consistent with this procedure.

5.3.5 Additional Requirements for RMA

All personnel performing work under the Rocky Mountain Arsenal (RMA) Program Management Contract (PMC) are required to adhere to the requirements set forth in Company Procedure PP-14, Substance Abuse Program and the Rocky Mountain Arsenal PMC Project Rules Handbook. Additionally, in reference to PP-14, Section 5.3.4, letter b), Positive Test Results, "The employee's supervisor..." is understood to be the PMC Program Manager or designee at RMA. This is an addendum to PP-14.

5.4 Collective Bargaining

The requirements of this procedure shall be included in the negotiation of any collective bargaining

agreements. For work on DOE sites, the requirements of the client approved project Substance Abuse Program must not be altered.

5.5 Employee Awareness Program

Employees and supervisors shall receive drug and alcohol abuse awareness training or communication as described herein.

Employees interested in counseling or in seeking rehabilitation may contact the Human Resources department for a confidential referral to available assistance programs.

Nothing in this procedure is intended to establish an obligation for the Company and/or its clients to rehabilitate employees who use illegal drugs or alcohol. Employees found to be in violation of this procedure are subject to disciplinary action up to and including termination notwithstanding any rehabilitation measures undertaken except, if such employee is deemed to be rehabilitated by the Company provided medical authority and remains free from illegal drug or alcohol use. Rehabilitated employees who engage in the use of illegal drugs, controlled substances, or alcohol are no longer deemed to be rehabilitated for the purposes of this procedure.

5.6 Off-the-job Drug or Alcohol Abuse

Off-the-job drug or alcohol abuse which makes an employee unfit for work, or which has a potential for adversely affecting the employee's job performance, or jeopardizing the safety of persons or property, or causing embarrassment or discredit to the Company, can be cause for disciplinary action.

5.7 Records and Sample Management

All laboratory records relating to positive drug test results, including initial test records and chromatographic tracings, shall be retained by the laboratory in such a manner as to allow retrieval of all information pertaining to the individual urine specimens for a minimum period of five years after completion of testing of any given specimen. In addition, the laboratory shall retain a frozen sample of all positive urine specimens for at least six months.

The testing service shall also maintain as part of its record, copies of all specimen chain of custody forms, which shall contain the following information:

a. Date of collection;
b. Tested person’s name and social security number;
c. Specimen number;
d. Type of test (random, applicant, occurrence, reasonable suspicion, follow-up, or other);
e. Temperature range of specimen;
f. Remarks regarding unusual behavior or conditions;
g. Collector’s signature; and
h. Certification signature of specimen provider certifying that specimen identified is in fact the specimen the individual provided.

All pre-employment forms shall be maintained in the employee’s permanent employee file. (See Attachments 1 & 2 for these forms.)

5.8 Testing Services

Only testing laboratories that are certified by the Department of Health and Human Services, under subpart C of the HHS Mandatory Guidelines are to be utilized. In addition, the contract with the testing services shall include records and sample management requirements in accordance with this procedure (see also 69 FR 19644, April 13, 2004).

5.9 Project Specific Workplace Substance Abuse Plans

This procedure (*excluding* Attachment 3) constitutes the Company's Workplace Substance Abuse Plan for all contracts other than for DOE and DOT Pipeline projects and shall be submitted to the client for approval as required by the contract terms. For DOE projects, this procedure, *including* Attachment 3, constitutes the Project specific Workplace Substance Abuse Plan. For DOT Pipeline projects, this procedure must be supplemented with the latest version of DOT 49 CFR 199 and facility operator specifics to constitute the project-specific Workplace Substance Abuse Plan. PMs may issue project specific procedures if contract requirements differ significantly from those herein. (See company procedure PP-25, Procedures - Authorization, Preparation and Distribution, for project procedure requirements.)

5.10 Personnel Practices Manual Application

The **Personnel Practices** have been developed to assist you in the day-to-day management of your employees.

These personnel practices are designed to provide fair and equitable treatment of all employees, as well as to protect the interests of the Company.

These practices are not an employment contract between the Company and any of its employees, nor are they a legal document. They are for descriptive purposes only. The purpose is to provide you with guidance on the administration of various personnel practices.

The Company, at its discretion, may change any of these practices without prior notice. It is also management's prerogative to authorize exceptions to these practices in individual situations. The cognizant Vice President and the Vice President of Human Resources must approve of all exceptions to this Manual. The Quality Rule does not apply to procedures outlined in the Personnel Practices Manual.

Members of the Human Resources department are available to help you interpret and administer these practices.

6.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation	
2. PR-1 - Procedures - Authorization, Preparation, and Distribution	
3.	

7.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Attachment 1 - Form for Permission to be Drug Tested	PP14at1.doc
2. Attachment 2 - Pre-Employment "Test" Agreement	See Below
3. Attachment 3 - Additional Requirements for DOE Prime Contracts and Subcontracts	See Below

ATTACHMENT 2
Tetra Tech EC, Inc. and its subsidiaries
PRE-EMPLOYMENT "TEST" AGREEMENT

The Company recognizes that the pre-employment contingencies that are related to drug tests and or physical tests have not been met, however, I will be scheduled in the very near future for these tests. I understand that my employment will be terminated in the event these tests are not successfully completed.

Click the icon below to launch or download.

PP14at2.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

ATTACHMENT 3
Tetra Tech EC, Inc. and its subsidiaries
ADDITIONAL REQUIREMENTS FOR DOE PRIME CONTRACTS AND SUBCONTRACTS

I. Identification of Designated Positions

For DOE client contracts (where the Company is the prime contractor or the subcontractor), the Program Manager (PM) in coordination with the Administration and Compliance department (i.e., the Company Facility Security Officer (FSO), see Project Initiation/Operations PO-13, Government Security) shall identify the positions designated for drug testing in accordance with 10 CFR 707.7 (b), 10 CFR 710, and paragraph IV below.

i. The PM shall notify the DOE Contracting Officer and the Human Resources department of the designated positions identified in accordance with item I above.

ii. The FSO shall maintain a list of all designated positions on all DOE contracts.

II. Responsibilities of Employees in Designated Positions

a. Individuals in designated positions who are not free from the use of illegal drugs are prohibited from working in a designated position.

b. Individuals in designated positions who are found to be in violation of this procedure (including this Attachment 3) are subject to disciplinary action in accordance with this procedure.

c. Employees in a designated position must notify their supervisor in writing of any drug-related arrest or conviction, or receipt of a positive drug test result as soon as possible but within 10 calendar days of such arrest, conviction, or receipt.

i. Immediately upon receipt of such notification, supervisor's must notify the PM, the FSO, and the Human Resources department.
ii. The FSO shall coordinate with the PM ensure appropriate notice to the DOE security officer and the Contracting Officer.

iii. Upon such notice the employee shall be removed from duty in a designated position and is subject to disciplinary action up to and including termination of employment.
iv. Employees failing to provide the required notice shall have their employment with the Company terminated immediately upon the Company learning of such failure. (not required by the regulations).

III. Permitted Screening

All applicants and employees are subject to pre-employment drug screening, testing on the basis of

reasonable suspicion, as a result of an occurrence, or as a follow-up to rehabilitation, and random urine drug testing at any time during the course of their employment in accordance with this procedure.

a. 100% of employees in PSAP or PAP designated positions and 50% of employees in positions which could significantly harm the environment, public health or safety, or national security (e.g., personnel directly engaged in production, use, storage transportation, or disposal of hazardous materials sufficient to cause significant harm to the environment or public health and safety, individuals with unescorted access to control areas of certain DOE reactors (see 10 CFR 707.7), and other positions as determined by DOE to have the potential to significantly affect the environment, public health and safety, or national security) will undergo such testing at least once every 12 months.

b. Employees who could have caused or contributed to an occurrence, requiring *immediate* notification or reporting to DOE, shall be tested as soon as possible after the occurrence, but within 24 hours of the occurrence. When the contract terms, DOE Orders or the applicable rules and regulations do not require immediate notification of the occurrence, such potentially involved employees may be tested as deemed appropriate by the Company.

IV. Rehabilitated Employees

While it is not the policy of the Company to offer employees rehabilitation, if an employee tests positive and is rehabilitated, the employee may not return to work at a DOE location unless the requirements of 10 CFR 707.14, Action Pursuant to a Determination of Illegal Drug Use, are met.

VI. PM Communication

a. The PM is responsible for coordinating, as described in this procedure, with the appropriate company officials such as the Human Resources department and the Administration and Compliance department to ensure that DOE is kept fully apprised of all aspects of the Substance Abuse Program.

b. The PM shall notify and coordinate with the Administration and Compliance department regarding any audit initiated by the client regarding this procedure or the implementation of this program on the contract.

VII. Applicability to Subcontracts

The PM submit all subcontracts believed to require a Substance Abuse Plan to the DOE Contracting Officer for determination as to whether the requirement applies.

VIII. Project Workplace Substance Abuse Plan

This procedure (including this Attachment 3) constitutes the Company's Workplace Substance Abuse Plan for DOE contracts and shall be submitted to the DOE Contracting Officer, or Prime Contractor, for approval as required by the contract terms. PMs may issue project specific procedures if contract requirements differ from those herein. (See company procedure PP-25, Procedures - Authorization, Preparation and Distribution, for project procedure requirements.) Any changes to this procedure shall be submitted to the DOE Contracting Officer for approval at least 30 days prior to implementation on DOE contracts requiring a Workplace Substance Abuse Plan.

IX. DOE Project Employee Positive Test Results

c) An individual who has been notified of a positive test result may request a retest of the *same* sample at the same or another certified laboratory. The individual shall bear the costs of transportation and/or testing of the specimen. (Required by DOE)
d) Confirmed positive test results shall be provided to the DOE Medical Review Officer and other Company and DOE officials with a need to know. Any other disclosure may only be made with the written consent of the individual.

X. DOE Designated Positions

Positions requiring 100% Annual Random Drug Testing:

1. Personnel Security Assurance Program (PSAP) positions:
   Positions that afford direct access to Category I quantities of Special Nuclear Material (SNM) or have direct responsibility for transportation or protection of Category I quantities of SNM[1].
   Positions that afford direct access to the control areas of a nuclear material production reactor.
   Positions with the potential for causing unacceptable damage[2] Unacceptable damage means an incident that could result in a nuclear explosive detonation, a major environmental release from a nuclear material production reactor, or an interruption of nuclear weapons productions with a significant impact on national security. to national security.

2. Personnel Assurance Program (PAP) Positions:
   Positions which entail critical duties that require an employee to perform work which affords both technical knowledge of and access to nuclear explosives sufficient to enable the individual t cause detonation (high explosive or nuclear).

3. Any individual, whether or not a company employee, who is allowed unescorted access to the control areas of the following DOE reactors:
   Advanced Test Reactors (ATR);
   C Production Reactors (C);
   Experimental Breeder Reactor II (EBR-II);
   Fast Flux Test Facility (FFTF);
   High Flux Beam Reactor (HFBR);
   High Flux Isotope Reactor (HFIR);
   K Production Reactor (K);
   L Production Reactor (L);
   N Production Reactor (N);
   Oak Ridge Research Reactor (ORR); and
   P Production Reactor (P).

Positions requiring 50% Annual Random Drug Testing:

1. Positions which entail duties where the failure of an employee adequately to discharge his or her position could significantly harm the environment, public health or safety, or national security such as:
   Pilots;
   Firefighters;
   Protective force personnel in positions involving use of firearms where the duties also require potential contact with, or proximity to, the public at large;
   Personnel directly engaged in construction, maintenance, or operation of nuclear reactors; or hazardous material sufficient to cause significant harm to the environment or public health and safety.

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[1] (SNM means plutonium, uranium enriched in isotope 233, or in isotope 235, and any other material which pursuant to the provisions Section 51 of the Atomic Energy Act of 1954, as amended, has determined to be SNM, but does not include source material; or any material artificially enriched by any of the foregoing, not including source material.

[2] Unacceptable damage means an incident that could result in a nuclear explosive detonation, a major environmental release from a nuclear material production reactor, or an interruption of nuclear weapons productions with a significant impact on national security.

appropriate in accordance with the Quality Rule. This document is not to be construed as an employment contract or any binding obligation of TtEC. This document may be modified or rescinded at any time with or without prior notice at the sole discretion of TtEC. Hard copies of this document may not contain the most current information. The current version of this document can be found on the TtEC online Corporate Reference Library.

FORM FOR PERMISSION TO BE DRUG TESTED

Dear Applicant:
Please read the following carefully; it contains information you should be aware of before accepting employment with Tetra Tech EC, Inc. or any of its subsidiaries (the "Company").

DRUG FREE WORKPLACE

The safety and well being of all employees is of prime importance to the Company. Providing a workplace that is free from the hazards of substance abuse is one method of protecting our most important asset—YOU.

The Company has always strictly prohibited the illegal use, distribution or possession of drugs or the unauthorized use of alcoholic beverages on Company premises. We are committed to maintaining a drug-free workplace. Your support is essential. Copies of our policy have been distributed to all employees and are available for review in the on-line Lotus Notes Corporate Reference Library or from the Human Resources Department.

Our Company policy requires all prospective employees to take and pass a drug-screening test. Your employment with the Company is contingent upon you passing this test, i.e., obtaining a negative result.

Please note that at the time of the test you MUST put down on the medical history form all medications or drugs you have taken in the past 30 days. It might be helpful for you to make a list of all prescription, non-prescription, and over-the-counter pills, liquids and injections you have taken in the last 30 days, and bring this list with you to the drug-screening test. If your test results are positive for any substances not listed on this form, you will be deemed to have failed the Company's drug screening, and your conditional offer of employment will be withdrawn. If, for whatever reason, you have begun employment prior to the availability of the results of the screening and the laboratory issues a positive result, you will no longer be eligible to continue employment and will be terminated.

As a condition of employment, all Company employees must abide by the terms of Company Procedure PP-14, Substance Abuse Program.

REPORTS OF DoD AND DEFENSE-RELATED EMPLOYMENT

The Department of Defense (DoD) requires that certain individuals who are employed by a defense contractor, such as the Company, file a special form with the Government. You may be required to file if you have had previous employment with a DoD component, are a retired or former military or civilian officer, earn at least $25,000 a year, and meet one or two other criteria.

Any qualifying individual who knowingly fails to file the form, or who falsifies any required information, may be subject to an administrative penalty of up to $10,000. Willful falsification of information may also further result in criminal prosecution.

If you have specific questions about your particular situation and the form's applicability to you, please direct them to the Government Contract Compliance Department, Morris Plains, New Jersey.

If you feel you may be required to file pursuant to 10 U.S.C.2397C, please review this with your Human Resources Representative during orientation. Forms are available in the Human Resources Department.

EMPLOYMENT ELIGIBILITY

TtEC will comply with the Immigration Reform and Control Act of 1986. All offers are contingent upon the applicant's ability to provide proof of eligibility to work in the United States. On the first day of employment, you must be prepared to present documents to verify that eligibility. Your Human Resources Representative has a list of acceptable documents that can be used for verification. Please check with your Human Resources Representative if you have questions.

An Equal Employment Opportunity Employer

FORM FOR PERMISSION TO BE DRUG TESTED

By signing below, I acknowledge that I have read and understand all that has been written above.

Sign:_____ Date:_____

TETRA TECH EC, INCORPORATED

DATE: _____

TO: _____
Applicant's Name

FROM: Tetra Tech EC, Inc.

SUBJECT: **Tetra Tech's Drug Screening Test**

Dear Applicant:

This is to notify you that Tetra Tech EC, Incorporated has a company policy requiring all prospective employees to take and pass a drug screening test. Your employment with Tetra Tech is contingent upon your passing this test, i.e. obtaining a negative test result.

Please note that at the time of the test you MUST list on the medical history form all medications or drugs you have taken in the past 30 days. It might be helpful for you to make a list beforehand of all prescription, non-prescription, and over-the-counter pills, liquids, and injections that you have taken in the last 30 days, and to bring this list with you to the drug screening test. If your results are positive for any substances not listed on this form, you will be deemed to have failed Tetra Tech's drug screening, and your conditional offer of employment will be withdrawn.

By signing below, I acknowledge that I have read and understood all that has been written above.

_____
(Applicant's Signature)

_____
(Date)

EHS 4-6 : Temperature Extremes

Last Revision By: Kennedy Lugo on 01/28/2011
Created By: Lisa Kaminski on 01/24/2011

Purpose:	The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.		
Version Date:	01/28/2011 - Revised	**Original Issue Date:**	02/01/95
Category:	Company Procedures	**Sections:**	ESQ - Environmental Health & Safety Programs
Sub Category:	Departmental/Discipline	**Document Type:**	Procedure
Keyword Index:	EHS Compliance/Waste Management, Monitoring, Operational Control, Training	**Document Owner:**	Grey Coppi
Approved By:			

Table of Contents
See Below

1.0 PURPOSE

The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. ("the Company") and subcontractor field personnel that may be exposed to heat or cold stress during the performance of their field work assignments.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

General responsibilities are found in EHS 1-1, Responsibilities for Program Implementation. Procedure specific responsibilities are:
Site Supervisors have the responsibility to:

a. Evaluate the work activities and anticipated temperatures that may affect worker productivity or harm workers.

b. Provide resources and facilities necessary to prevent health effects from temperature extremes.

c. Enforce work rules related to such prevention.

3.1.2 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) will make the initial determination of heat and cold stress prevention requirements as part of the site EHS Plan (see EHS 3-2, EHS Plans) and oversee the implementation of this program on a project basis for all Company field

programs.

The Environmental Safety Supervisor (ESS) will assist with implementation of heat and cold stress prevention programs. The ESS will, in most cases, be the person responsible for monitoring heat and cold stress on the job, determining work/rest and work/warm-up schedules where used, and will implement emergency response or corrective action, if needed. The ESS will train site personnel on the effects of temperature extremes and the site prevention program, and will maintain records related to this program.

The ESS will implement the appropriate heat stress or cold stress requirements when temperatures indicate a potential heat or cold stress condition. The ESS will work with the line management to implement work rest regimens or other administrative controls such as ceasing certain activities, changing PPE, or engineering controls such as warming areas, cooling areas or shifting work schedules.

3.2 General Program Requirements

Adverse temperature conditions must be considered when planning site operations. Heat and cold stress injuries are completely avoidable with the proper education and work monitoring.

Implementing organizations will determine if contractual or regulatory requirements apply. Numerous Federal Agencies (e.g. USCOE, DOE) will contractually impose requirements related to temperature extremes. Also several states have passed regulations with requirements that will be applicable when working in those areas. In these cases, the information in the Guidance section and the attachments may become requirements.

4.0 GUIDANCE

This section contains optional guidance information to successfully execute the procedure.

4.1 Definitions

4.1.1 Body Core Temperature

The temperature of the organs within the trunk of the body.

4.1.2 Deep Frostbite

The tissue beneath the skin is solid to the touch; it may involve a full thickness freeze to the bone. This is an extreme emergency and can result in permanent tissue loss.

4.1.3 Frostbite

Freezing of body tissue.

4.1.4 Frostnip or Incipient Frostbite

A cold related injury that progresses slowly and is painless while developing. The victim is usually unaware that he/she has frost nip. The skin first becomes reddened, then changes to white; no freezing of tissue occurs.

4.1.5 Heat Cramp

Painful muscle spasms usually occurring on the arms, legs, and abdomen; caused by excessive loss of body electrolytes from profuse sweating.

4.1.6 Heat Exhaustion/Fatigue

Heat Exhaustion is a form of shock that occurs when the body loses large amounts of water

and electrolytes from excessive perspiration after exposure to heat and physical activity; also called heat prostration. Symptoms include profuse sweating, pale, cool, sweaty skin and other symptoms identified in Attachment 1, Section 1.3.
Heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Works unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance.

4.1.7 Heat Rash

Profuse tiny raised red vesicles (blister-like) on affected areas of the skin which cause a prickling sensation during heat exposure.

4.1.8 Heat Stroke

A life-threatening condition caused by rapidly rising body core temperature that occurs when the body's temperature regulating mechanisms are overwhelmed. Sweating stops and the skin is dry and hot.

4.1.9 Hyperthermia

A rise in body core temperature above 99.6^{O} F.

4.1.10 Hypothermia

Decreased body core temperature from prolonged exposure to freezing or near-freezing temperatures. This is the most life-threatening cold injury and affects the entire body with possible localized severe cooling. Hypothermia is defined as the deep body temperature dropping below 96.8^{O}F (36^{O}C).

4.1.11 Superficial Frostbite

Frostbite which affects the skin and tissue just beneath the skin. The skin is firm and waxy, tissue beneath is soft and numb. The skin turns purple and may tingle and burn during warming.

4.1.12 Wet-Bulb Globe Temperature (WBGT) Index

Method used to measure the environmental factors (e.g., temperature, relative humidity) which impact the body's physiological responses to heat.

4.1.13 Wind-Chill Factor or Equivalent Chill Temperature (ECT)

An index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

4.1.14 Work/Recovery Regimen

The ratio of time spent working to time spent resting in an area designed to relieve heat related conditions. This ratio is expressed in one hour periods. Example: A work/recovery regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

4.2 General Program Guidance

Excessively hot or cold working environments can produce a number of different injuries. Critical to the ability to care for those injuries is a basic understanding of the way in which the body maintains its temperature and how it physiologically adjusts to extremes of heat and cold.

Preventing Heat and Cold Stress is prevented by planning in advance, and by training affected personnel in the symptoms of temperature extremes. OSHA has not established a temperature

extremes standard, instead relying on the general duty clause.

The US Army Corps of Engineers has established requirements for work under its control in "EM-385-1-1, most current edition and ACGIH TLV/BEI Guide, most current edition."

The ACGIH Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices has updated its recommendations "in the ACGIH TLV/BEI Guide, most current edition." These recommendations are incorporated in the appropriate sections.

Several states have also passed regulations or temperature extremes (e.g. Washington, California).

Three attachments are attached to provide information related to temperature extremes:

- Attachment 1 provides information on the body's physiological responses to heat and cold stress.
- Attachment 2 provides information on Heat Stress Monitoring and Work/Rest Regimens.
- Attachment 3 provides information on Cold Stress Monitoring and Work Recovery Regimens.

Proper care of victims who are suffering from the effects of heat or cold exposure will help to minimize injuries and speed recovery. On the other hand, improper treatment of these emergencies can result in serious injury, disability, or death.

The most effective first aid for any injury is prevention. When acceptable monitoring and prevention programs are followed, there should be no victims.

4.3 Heat Stress

A heat stress prevention program will be implemented when ambient temperatures exceed 70^{o}F (21° C) for personnel wearing **permeable** clothing. Wet Bulb Globe Temperature Index (WBGT) or physiological monitoring will be conducted. When a WBGT Index is not available, or workers are wearing impermeable clothing, or the WBGT is not representative to the actual work area (enclosed work areas, work over asphalt or reflective materials etc.) **physiological** (pulse, temperature) **monitoring** may be used in its place.

WBGT devices located away from the project (up to several miles) maybe used for monitoring the project if the general weather and measured work surfaces are similar.

4.3.1 Selection of Chemical Protective Clothing

The PESM will review site data and working conditions and select the personal protective equipment ensemble that best protects the employees from site hazards. The risk of heat related illness will be fully considered in balancing the risks and benefits of the PPE.

4.3.2 Hydration

The Company will supply cool potable water or other suitable drinks (e.g., sport electrolyte replacements) for fluid replacement. Employees involved in the heat stress prevention program will be trained and encouraged to drink at a rate of approximately 8 oz. every 20 minutes. Individual disposable cups will be used and kept in closed containers or dispensers. Alternately, cool bottled water or sports drinks in individual sealed bottles may be provided.

4.3.3 Cool Rest Areas

Shaded rest areas will be provided. On large remediation projects, air conditioned rest areas should be provided for workers exposed to heat stress conditions. In low humidity locations, evaporative coolers or misting devices and fans can be used to provide cool down locations. On smaller projects, personnel can use air-conditioned vehicles as cool down areas.

4.3.4 Other Prevention Elements

The PESM, ESS and the Project Manager will incorporate other elements into the heat stress prevention program as necessary. The selected elements will be described in the EHS plans. Engineering controls are preferred. Where their use is not feasible, the program must incorporate administrative/work practice controls, personal protective equipment, or a combination. Examples of prevention program elements include:

a. Engineering Controls
    - Air conditioned cabs for heavy equipment and vehicles (such controls may eliminate the need for other program elements).
    - Fans, blowers, or misters
    - Cool water for drenching personnel in impermeable clothing. This can be provided through a garden hose, a garden sprayer filled with ice water, a clean

drum full of water for "hard hat dipping" for containers of ice water and clean towels in the rest area to hasten cool down.

b. Administrative and Work Practice Controls

- Adjusting work schedules to do the bulk of the work during the cooler parts of the day.
- Acclimating workers.
- Implementing work/rest regimens (See Attachment 2 for Work/Rest Regimen Procedures)

c. Personal Protective Equipment

- Ice Vests
- Circulating water vests
- Vortex tubes and air circulating vests

Where ice vests and circulating water vests are used, rest periods of approximately 15 minutes should be taken when ice packs or batteries need to be changed. Continuous work over long periods of time with these devices may present an increased musculoskeletal injury risk due to the extra weight. Since the duration of the cooling effectiveness of these devices will vary with heat and work loads, users must be instructed to leave the area to replenish ice or batteries at the first sign of loss of cooling.

d. Monitoring

A program of environmental and physiological monitoring must be established in order to use work/rest regimens to verify the effectiveness of the regimens. The monitoring procedures are described in Attachment 2.

4.3.5 Training

All site personnel must receive training on the following topics:

a. Health effects of hot environments and symptoms of heat related illness.

b. Personal risk factors; including use of some medications (e.g. blood pressure, allergy, renal or sweat gland functions), physical condition, insufficient sleep; attempting full work loads when not fully acclimatized and dehydration due to consumption of alcohol, consumption of caffeine or other diuretics.

c. Effect of personal protective equipment on heat stress conditions.

d. Preventive measures

- Physiological monitoring methods and thresholds
- Acclimatization

e. Fluid replacement; including taking frequent breaks for fluid replacement on an as-needed basis, maintaining hydration and electrolyte balances.

f. Elements of the site Heat Stress Prevention Program.

g. First aid and emergency response

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

4.4 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trenchfoot or immersion foot, and hypothermia as well as slippery surfaces, brittle equipment, poor judgment and taking short cuts. ACGIH guidelines are provided in Attachment 3. The Company will implement the following cold stress prevention program elements when there is a potential for cold related injuries. Workers should be protected from exposure to cold so the core body temperature does not fall below the Threshold Limit Value of 96.8^{o}F (36^{o}C).

4.4.1 Personnel Protective Equipment

The following personal protective equipment will be provided as necessary to Company employees when conditions indicate a potential for cold-related injury. Subcontractors will be expected to supply appropriate equipment to their employees.

a. Hard hat liners, face covers

b. Gloves or glove liners, chemical sock and glove warmers

c. Rain gear or water impermeable coveralls and gloves for potentially wet operations

d. Fleeced boot liners where rubber steel-toe boots are used

e. Winter coveralls

4.4.2 Engineering Controls

A variety of engineering controls shall be evaluated to minimize cold stress. These include:

a. General or spot heating should be used to increase temperature at the workplace.

b. If fine work is to be performed with bare hands in a cold environment, special provisions should be made to keep the workers' hands warm. Warm air jets, radiant heaters, or contact warm plates can be used.

c. The work area should be shielded from winds and drafts that may affect the wind chill factor.

d. The air velocity in refrigerated rooms should be minimized as much as possible, and should not exceed 2.2 mile/hour (1m/sec) in the work zone.

e. At temperatures below freezing, metal handles of tools and control bars should be covered with thermal insulating material.

f. Unprotected metal chair sets should not be used as they conduct heat away from the body.

g. When necessary, equipment and processes should be substituted, isolated, relocated, or redesigned to reduce cold stress at the worksite.

h. Power tools, hoists, cranes, or lifting aids should be used to reduce metabolic workload.

i. Heated warming shelters such as tents and cabins should be made available if work is performed continuously in an equivalent chill temperature of 20^{o}F or below.

j. The ESS may implement a work-rest schedule to reduce exposure to cold stress.

k. Scheduled rest breaks should be enforced.

l. Personnel exposed to the cold should be provided the opportunity for frequent intake of warm, sweet, caffeine-free, nonalcoholic liquids or soup.

m. Work should be moved to warmer areas whenever possible.

n. Extra workers should be assigned to highly demanding tasks.

o. Workers should be allowed to pace themselves, taking breaks when needed.

p. Workers shall be trained in the prevention, symptoms, and emergency response to cold stress.

q. Utilize the "buddy system" to monitor cold stress symptoms among the workers.

r. Allow new employees time to adjust or "acclimate" to cold conditions.

s. Minimize the need to sit or stand in one place for long periods of time.

t. Minimize the amount of work time spent in a cold environment.

u. Allow for the weight and bulkiness of protective clothing when estimating work performance goals and tasks.

4.4.3 Warm Rest Areas

The Company will make warm rest areas, e.g., heated trailers, available for rest breaks in cold weather. Employees will be permitted and encouraged to use the heated trailers whenever they experience symptoms of cold stress.

4.4.4 Work/Warm-Up Schedules

The work/warm-up schedule found in the ACGIH for cold stress will be followed as a guideline unless a government project, where they are required by ACOE or DOE regulation (Attachment 3). In addition, the Company will make warm-up periods available to employees who need to change into dry clothing to prevent immersion foot or hypothermia.

4.4.5 Training

All Company employees and subcontractors will be trained in:

a. The effects of cold stress, including frostbite, immersion foot and hypothermia.

b. Conditions that can lead to hypothermia, including work practices, clothing, activity levels, wind chill.

c. Personal risk factors, including use of some medications, physical condition, insufficient sleep, dehydration due to consumption of caffeine, alcohol or other diuretics.

d. Recognition of the symptoms.

e. Methods employees can use to protect themselves.

f. First aid procedures and recognition of medical emergencies.

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. ACGIH (American Conference of Government Industrial Hygienists) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2007	
2. Fundamentals of Industrial Hygiene. Third Edition, 1988	
3. National Safety Council	
4. NIOSH (National Institute for Occupational Safety and Health)	
5. NIOSH/OSHA/EPA/USCG/EPA	
6. Occupational Exposure to Hot Environments, Revised Criteria 1986	
7. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - October 1985	
8. EHS 1-1, Responsibilities for Program Implementation	
8. EHS 1-9, Recordkeeping	

9. EHS 3-2, Environmental, Health & Safety Plan(s)	
10. US Army Corps of Engineers, Safety & Health Manual (EM 385-1-1) Nov 2003, Section 06.J.04	

6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
1. Heat and Cold Stress Information	EHS 4-6, Attachment 1 final 11-8-08.doc
2. Heat Stress Monitoring and Work/Rest Regimens	EHS 4-6, Attachment 2 Final 11-11-08.doc
3. Cold Stress Monitoring and Work/Recovery Regimens	EHS 4-6, Attachment 3 final 11-8-08.doc
4. Example - WBGT Monitoring Form	Attachment 4 Example WBGT Monitoring Form 11-11-08.doc
5.	

ATTACHMENT 1

HEAT AND COLD STRESS INFORMATION

1.0 HEAT STRESS

Hot weather can cause physical discomfort, loss of efficiency, and personal injury. The human body strives to maintain a constant core temperature of 98.6^{o} F (37^{o} C). If this temperature is to be maintained, heat loss must equal heat production. This balance is maintained by variations in the blood flow to the outer part of the body. When the core temperature rises, blood vessels beneath the skin dilate, and the blood brings increased heat to the skin, where it is dissipated by radiation and convection. This works only as long as the skin temperature is higher than the temperature of the outside environment. Heat loss by radiation convection is impossible when the temperature of the outside air approaches or exceeds the temperature of the skin. The body will now rely on dissipation through evaporation of sweat. But the sweat mechanism also has limits. The normal adult can sweat only about one liter per hour and can sweat at that rate for only a few hours at a time. In addition, sweating is effective only if the relative air humidity is low. Sweat evaporation ceases entirely when the relative humidity reaches 75 percent.

Of particular concern in heat stress monitoring is the use of personal protective clothing which decreases natural body ventilation and greatly increases the temperature and humidity to the skin. If precautions are not taken, heat stress will progress into a heat-related injury. Heat-related injuries fall into three major categories: heat cramps/fatigue, heat exhaustion, and heat stroke.

1.1 Heat Cramps

Heat cramps are the least common and least severe of heat injuries. Heat cramps are thought to occur when the electrolytic balance in the blood between water, calcium, and sodium (salt) is altered. Low blood salt level, from profuse sweating and inadequate salt consumption, is the usual cause, as well as poor conditioning..

1.1.1 Symptoms

a. Severe muscle cramps and pain, especially of the upper legs, calves, and abdomen, and occasionally in the arms

b. Faintness and dizziness

c. Possible nausea and vomiting

1.1.2 Treatment

Emergency care will include:

a. Remove victim from the hot environment and allow victim to rest and cool down

b. Provide small amounts of cool water or use a commercial sport drink and allow victim to sip this solution to hydrate. Avoid drinks with caffeine or alcohol.

c. To relieve pain, gently stretch the involved muscle group; gently message cramps as long as it does not increase the pain or discomfort.

The victim should avoid exertion of any kind for 12 hours. A victim of heat cramps is prone to recurrence.

1.2 Heat Fatigue

Heat Fatigue is most likely to affect new or un-acclimatized workers.

1.2.1 Symptoms

a. Loss of energy, extreme tiredness

b. Stumbling, staggering, or loss of balance. The loss of balance is a particular risk to workers on elevated surfaces or climbing.

c. Excessive skin redness as body moves blood to surface

d. Lack of judgment recognizing the onset of heat fatigue and taking action to remove themselves from the environment for cool down and hydration

1.2.2 Treatment

a. Remove from the hot work environment for cool down

b. Provide fluids (cool water or sport drinks to re-hydrate the victim

c. Extend cool-down period or cessation of work for the day with extra hydration and rest

d. Enhance observations by other workers and physiological monitoring

e. Provide individual work/rest regimens until acclimatized

1.3 Heat Exhaustion

1.3.1 Symptoms

Heat exhaustion is the most common heat injury and usually occurs in an individual who is involved with heavy physical exertion in a hot, humid environment, and is wearing protective clothing. Heat exhaustion is a mild state of physical shock caused by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body also loses large amounts of salt and water.

The symptoms of heat exhaustion include:

a. Profuse sweating

b. Pale, cool, sweaty skin

c. Headache and extreme weakness, fatigue

d. Nausea and possible vomiting

e. Dizziness and faintness

f. Collapse and possible brief unconsciousness

g. Body core temperature from 100.4^{o} F (38^{o} C) to 104^{o} F (40^{o} C), although skin temperature may even be slightly below normal.

1.3.2 Treatment

Emergency care will include:

a. Remove victim from the hot environment and out of the exclusion zone

b. Lie victim down with feet slightly raised

c. Remove as much clothing as reasonable (especially personal protective clothing); loosen what cannot be removed

d. Apply cold, wet compresses to the skin; fanning will also aid in cooling

e. If the victim is fully alert, allow him/her to drink water at the same rate, that was used for the emergency care of heat cramps

f. If the victim vomits, do not give fluids by mouth, transport him/her to a hospital immediately (dehydration is the most critical problem in heat exhaustion victim; intravenous fluids will have to be given)

g. Take temperature every 10 minutes, if the victim's temperature is above 101°F (38.3 C) or shows a steady increase, transport to a hospital immediately and start sponging him/her off with cool water

1.4 Heat Stroke

Heat stroke is a true life-threatening emergency having a mortality rate of 20 to 70 percent. This condition results when the heat regulating mechanisms of the body break down and fail to cool the body sufficiently. The body temperature rises to between 104^{o} F and 110° F (40.6 – 43.3° C); no sweating occurs in about 50 percent of the victims. Because no cooling takes place, the body stores increasingly more heat, and eventually brain cells are damaged, causing permanent disability or death.

There are two basic kinds of heat stroke: classic heat stroke and exertional heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally effects the elderly or chronically ill. Exertional heat stroke, in which victims retain the ability to sweat, is accompanied by physical exertion and muscle stress. Exertional heat stroke is the type that will be most commonly encountered on a field operation requiring strenuous physical activity.

1.4.1 Symptoms

a. Oral temperature of 104^{o} F (40^{o} C) or higher

b. Hot, reddish skin, skin is usually dry

c. Headache

d. Dry mouth

e. Shortness of breath

f. Nausea or vomiting

g. Increasing dizziness and weakness

h. Mental confusion and anxiety; victims may show unusual irritability, aggression, combative agitation, or hysterical behavior

i. Convulsions, sudden collapse and possible unconsciousness; all heat stroke victims having varying levels of consciousness, ranging from disorientation to coma

1.4.2 Treatment

Emergency care will include:

a. Remove the victim from the hot environment and from the exclusion zone

b. Call for trained emergency medical personnel **immediately**

c. Remove as much clothing as reasonable (especially personal protective clothing); cut clothing with bandage scissors, if necessary, being careful not to injure victim

d. Pour cool water over the victim, avoiding his nose and mouth

e. Fan the victim

f. Place cold packs under the arms and against neck, groin and ankles

g. Wrap victim in a wet blanket

h. Continue a combination of these methods until the oral temperature falls below 103^{o} F (39.4^{o} C) (take measures to prevent chilling, if necessary, i.e., use slower cooling if the victim starts shivering

i. Elevate the head and shoulders slightly during cooling

j. Never give the victim anything to drink unless fully conscious and vomiting is unlikely

Because heat stroke involves the entire body, a number of complications may result including brain swelling, convulsions, coma, kidney failure, liver failure, high blood pressure and heart failure.

Therefore, always transport the victim to a hospital even if the body core temperature has lowered to near normal.

1.5 Heat Stroke Verses Heat Exhaustion

The two most reliable and distinct differences between heat stroke and heat exhaustion are:

1.5.1 Heat Stroke

a. Skin flushed (red); may be dry; hot to touch (note: Personnel who have been wearing impermeable clothing may have wet skin from earlier sweating that has ceased.)

b. Oral temperature above 104°F (40^{o} C)

1.5.2 Heat Exhaustion

a. Skin pale; wet or clammy; cool to touch

b. Oral temperature usually normal

2.0 COLD STRESS

Hypothermia is a drop in the core body temperature below 96.8^{o} F (36^{o} C). The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95^{o} F (35^{o} C); this is followed by a slowed and sometimes irregular heart beat, a weakened pulse and a drop in blood pressure. Vague or slow slurred speech, memory lapses, apathy, incoherence and drowsiness can occur. Other symptoms may include cool skin, slow, irregular breathing, apparent exhaustion, and fatigue after rest.

2.1 Prevention

Hypothermia is caused by prolonged exposure to a cold environment, whether air, water, or snow and ice. Adequate dry clothing with appropriate insulating capacity must be provided to workers to prevent hypothermia, especially if work is performed in air temperatures below 40° F (4.4^{o} C). Wind chill is a critical factor. Work at a slow but steady pace. The job should be a "no sweat" operation.

Unless there are unusual or extenuating circumstances, cold injury to other than the extremities (hands, feet, and head) is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against hypothermia. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are special precautions that should be considered for these workers. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

2.2 Treatment

First aid for mild hypothermia will be performed as follows:

a. End the exposure - get the victim out of the cold and wet

b. Replace wet clothing with dry or add insulation to clothing

c. Offer warm, non-alcoholic fluids

d. Increase exercise

e. Seek shelter from wind, wet and cold

CAUTION: If the victim remains cold for a number of hours, chemical changes may have taken place which, on re-warming, may cause major medical problems for the victim and which could result in death. Severely hypothermic victims are best warmed in the hospital under controlled conditions. If a severely hypothermic victim cannot be transported to a hospital within a few hours, re-warming should begin in the field.

2.3 Frostbite

2.3.1 Prevention

Frostbite can be prevented by wearing sufficient protection to prevent skin from coming into prolonged contact with a freezing environment. The following steps can be taken.

a. Wear sufficient clothing. Mittens are better than gloves. Face masks and wool stocking caps are better than hats. Wind and waterproof hoods protect the face and neck.

b. Clothing should be loose enough to prevent constriction of blood vessels. Boots must be roomy enough to permit movement of the toes with no feeling of tightness.

c. Do not contact conductive metals or contact gasoline or other solvents with bare skin as rapid evaporation of solvents may quickly lead to frozen tissues in a cold environment.

d. Exercise the toes and fingers to maintain circulation.

e. Observe the condition of your partners' face, hands and ears frequently for signs of frostbite.

f. Avoid smoking and drinking alcoholic beverages.

2.3.2 Symptoms

Frostbite can occur either before or after the onset of hypothermia when body tissue (usually an extremity) is exposed to freezing temperatures. Frostbite occurs when the fluids surrounding tissue cells freezes. The danger of frostbite increases with increased wind chill and/or reduced temperatures below 32^{o} F (0^{o} C). Frostbite can also occur if tissues are in prolonged contact with a frozen material or object. Skin contact with frozen metal, for example, can result in frostbite in a short period of time, even in a warm environment.

There are three degrees of frostbite:

a. First degree - freezing without blistering or peeling, "frostnip"

b. Second degree - freezing with blistering and/or peeling, and

c. Third degree - freezing resulting in the death of skin tissue and possibly the death of underlying tissues as well

Symptoms of frostbite include the following:

a. The skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies

b. Pain may be felt at first, but subsides

c. Blisters may appear, and

d. The affected area is cold and numb

2.3.3 Treatment

First aid for superficial (first degree) frostbite is as follows:

a. Place a warm body part next to the frozen area, applying firm, steady pressure.

b. DO NOT RUB THE AREA. Rubbing may cause further damage to already injured skin.

c. Protect the area from further freezing.

First aid for deep frostbite (second and third degree) is as follows:

a. KEEP THE FROZEN PART FROZEN!

b. Prevent further injury: avoid rubbing and further freezing of unaffected tissue.

c. If the part has thawed, the part should NOT be allowed to refreeze or bear weight. A victim with thawed feet should be carried out.

d. Give the victim plenty of fluids and evacuate to medical assistance as soon as possible.

2.4 Trench Foot

2.4.1 Symptoms

This condition may be caused by long, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. Edema (swelling), tingling, itching, and severe pain occur, and may be followed by blistering, death of skin tissue, and ulceration. When other areas of the body are affected besides the feet, the condition is known as chilblains.

2.4.2 Prevention

Trench foot and chilblains can be prevented by keeping the body as dry as possible at all times. Waterproof boots should be worn when required, but provisions must be made for preventing excessive perspiration to accumulate inside the boots. Socks should be changed at least twice daily and the boots wiped dry inside with each change of socks. The feet should also be wiped dry and foot powder applied.

2.4.3 Treatment

Affected body parts should not be rubbed or massaged, but bathed in water using plain white soap. Dry thoroughly and elevate the body part, allowing the body part to be exposed at room temperatures. If the feet are affected, do not walk during treatment.

(Internal Note – this attachment is a total revision and no revision bars are shown)
ATTACHMENT 2

HEAT STRESS MONITORING AND WORK/REST REGIMENS

1.0 INTRODUCTION

Establishing a work/rest regimen that allows work to be completed in a timely manner while providing adequate rest time to prevent heat stress requires involvement of the ESS, Project Supervisors, and individuals involved. In many cases, particularly when wearing normal field type clothing (i.e., level D), awareness and communication are the key elements to a successful program. Allowing and encouraging rest periods on an "as needed" basis while ensuring vigilance for initial symptoms of heat stress, encourages this success.

There are times when this approach is not appropriate. When heat stress contributing protective clothing (e.g., respirators, impermeable coveralls) are worn for extended periods, or when "as needed" work/rest regimens adversely impact either the individuals exposed to the heat source or work completion, a more formal work/rest regimen will be established.

Formal work/rest regimens are based on when Action Levels and TLV limits are approached and: 1) monitoring ambient conditions (e.g., with a Wet Bulb Globe Temperature Index (WBGT), estimating work loads and establishing work/rest times, 2) monitoring physiological conditions and adjusting work/rest periods, 3) applying Job Specific Controls.

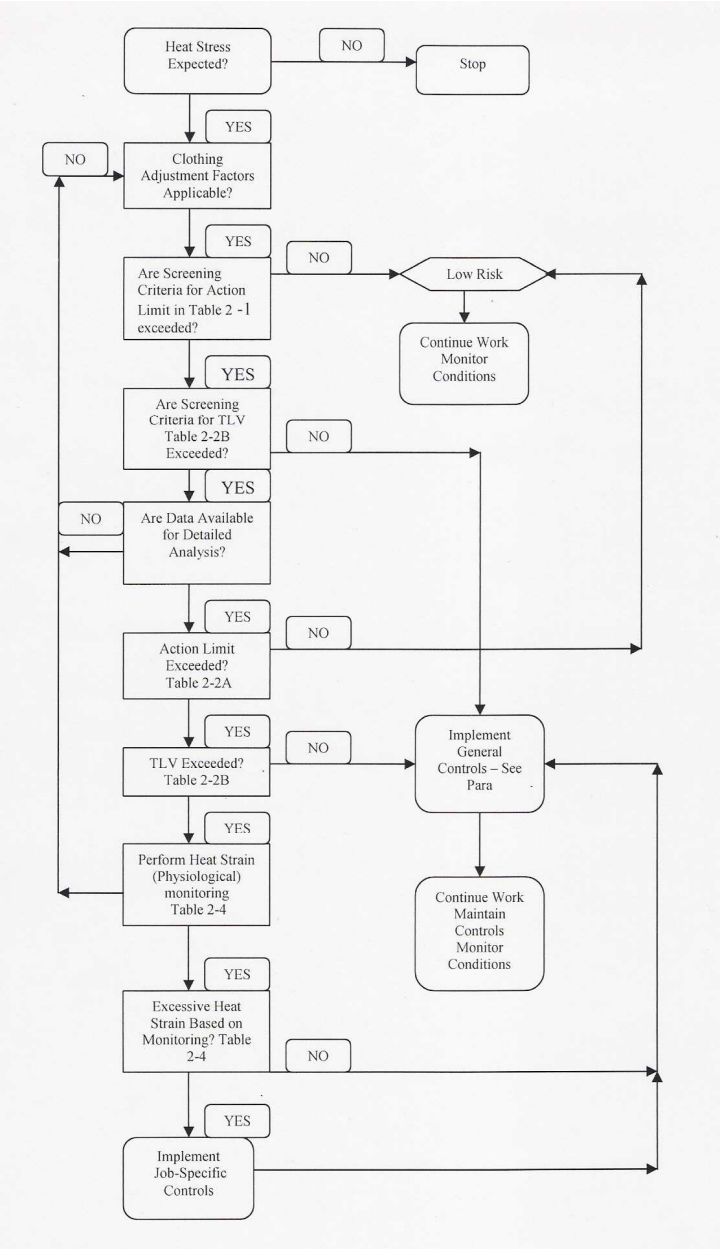
The WBGT, physiological monitors, and personnel heat stress monitors will be used in accordance with manufacturer's instructions. Personnel heat stress monitors will be approved for use by the PESM.

This attachment includes guidance for monitoring and preventing heat stress and heat strain in accordance with the 2007 ACGIH. The 2007 ACGIH Guidelines were revised to include an Action Level and a Threshold Limit Value based on WBGT measurements). The goal is to maintain body core temperatures within +/- 1.8° F of 98.6° F (+/-1° C. of 37° C) The TLV represents conditions under which it is believed that nearly all acclimatized, adequately hydrated, unmedicated, healthy workers may be repeatedly exposed without adverse health effects. The Action Limit is similarly protective of unacclimatized workers and represents conditions for which a heat stress management program should be considered.

This guidance is not a fine line between safe and dangerous. Therefore professional judgment is of particular importance in assessing the level of heat stress and physiological heat strain to provide for protecting nearly all healthy workers with due consideration of individual types and type of work.

The decision process shown in Figure 1-1 should be started if 1) a qualitative exposure assessment indicates the possibility of heat stress, 2) there are reports of discomfort due to heat stress, or 3) professional judgment indicates heat stress conditions.

Figure 1-1 – Evaluating Heat Stress and Strain



Note: At the option and judgement of the ESS, physiological monitoring may be commenced at any time, supplementing or replacing WBGT monitoring.

2.0 WBGT-BASED WORK/RECOVERY REGIMENS

2.1 Work/Recovery Regimens

When required, the WBGT Index will be used in conjunction with the work load, protective clothing, and other factors to determine the appropriate work/recovery regimen and need for physiological monitoring for personnel.

The ESS will monitor the temperature, work loads, and protective clothing. The WBGT will be adjusted based on the clothing adjustment factors. The Work Loads and the WBGT will then be used to determine the Work and recovery cycles for the workers involved.

The work/recovery regimen using the WBGT procedure will be used as a guideline, as the WBGT is only an index of the environment. Table 2-1 identifies the Clothing Adjustment factors.

Table 2-1 Clothing-Adjustment Factors for Some Clothing Ensembles

Clothing Type	Addition to WBGT Index
Work Clothes (Long Sleeve Shirt and Pants)	0° F (0° C)
Cotton (woven material) Coveralls	0° F (0° C)
Double Layer woven Clothing	5.4° F (3° C)
SMS Polypropylene Coveralls	1.0° F (.5° C)
Polyolefin Coveralls	1.8° F (1° C)
Limited-Use Vapor Barrier coveralls	19.8° F (11° C)

Notes on Table 2-1:
For example, WBGT Index is 86 ^{o} F. If double layer woven overalls (5.4° F) are used with acclimatized workers the Corrected Index Temperature is 91.9 ^{o} F.

These values must not be used for completely encapsulating suits, often called Level A. Clothing Adjustment factors cannot be added for multiple layers. ***The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.***

These values may also apply to other protective clothing, such as rain suits, when worn where the body is fully covered and the worker does not have the option of opening or venting the clothing while working (e.g. individuals in a radiological zone or other hazardous areas.

Tables 2-2-A and 2-2-B outline the work/recovery regimens based upon WBGT temperature and workload.

Table 2-2A Permissible Heat Exposure Action Limit Values
(Values are given in °F and (^{o}C) WGBT Index)*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	82.4 (28.0)	77.0 (25.0)		--
50% to 75%	83.3 (28.5)	78.8 (26.0)	75.2 (24.0)	--
25% to 50%	85.1 (29.5)	80.6 (27.0)	77.9 (25.5)	76.1 (24.5)
0% to 25%	86.0 (30.0)	84.2 (29.0)	82.4 (28)	80.6 (27)

Table 2-2B Permissible Heat Exposure Threshold Limit Values)
(Values are given in °F and (^{o}C) WBGT)*

Allocation of Work in a Cycle of Work and Recovery	Work Load Category			
	Light	Moderate	Heavy	Very Heavy
75% to 100%	87.8 (31.0)	82.4 (28.0)	---	--
50% to 75%	87.8 (31.0)	84.2 (29.0)	81.5 (27.5)	--
25% to 50%	89.6 (32.0)	86.0 (30.0)	84.2 (29.0)	82.4 (28.0)
0% to 25%	90.5 (32.5)	88.7 (31.5)	86.9 (30.5)	86.0 (30.0)

Notes on Table 2-2-A & 2-2-B:

a. The values in Table 2-2A & 2-2B are for fully acclimatized workers wearing light weight pants and long sleeved shirts. For conditions other than this, use this table with the Clothing Adjustment factors from Table 2-1. For unacclimatized workers, the Action Limit Values should be used as TLVs.

b. These values assume that workers drink frequently and have properly increased salting of food prior to exposure.

c. These values are guidelines. Actual levels may be modified based on individual physiological response and actual work and rest conditions.

d. These values assume that the rest location is cool enough to alleviate heat load conditions.

e. See Table 2-2C for Work Load Categories.

f. Values in the table are applied by reference to the "Work-Rest Regimen" section and assume 8-hour workdays in a 5-day workweek with conventional break.

g. Because of the physiological strain associated with Heavy and Very Heavy work among less fit workers, regardless of the WBGT Index, criteria values are not provided for continuous work and for up to 25% rest in an hour for Very Heavy work. The screening criteria are not recommended, and a detailed analysis and/or physiological monitoring should be used.

h. WBGT Index values are expressed to the nearest .5^{o}C and .1^{o}F

Table 2-2C provides examples of work activity categories for use in table 2-2A and 2-2B. Recovery rest areas should be near the work areas, shaded, and with adequate supplies of cool water. Aids to assist in evaporative cooling such as fans or blowers should be considered.

Table 2-2C Work Load Categories

Categories	Example Activities
Resting	Sitting quietly
Light	Sitting with light manual work with and or hands and arms, and driving. Standing with some light arm work and occasional walking.

Moderate	Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. Normal walking.
Heavy	Intense arm and trunk work, carrying, shoveling, manual sawing, pushing and pulling heavy loads; walking at a fast rate.
Very Heavy	Very intense activity at fast to maximum pace,

2.2 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full heat acclimatization requires physical activity under heat-stress conditions similar to those anticipated for the work. With a recent history of heat-stress exposures of at least 2 continuous hours (e.g. 5 of the last 7 days to 10 of 14 days) a worker can be considered acclimatized for the purposes of the TLV shown in table 2-2B.. Its loss begins when the activity under those heat-stress conditions is discontinued, and a noticeable loss occurs after 4 days and may be completely lost in 3 to 4 weeks. Because acclimatization is to the level of the heat stress exposure, a person will not fully acclimatize to a sudden higher level, such as during a heat wave.

Numerous factors can affect acclimatization and a worker's ability to work in heat, including age and off-work activities (amount of sleep, consumption of alcoholic beverages, prescription and nonprescription mediations (e.g. antihistamines and other medications that decrease the body's ability to carry water or reduce sweating).

2.3 WBGT Determination

WBGT device should be operated in accordance with the manufacturer's instructions. The location of the WBGT device should be evaluated based on the work. Work inside buildings (no wind), within depressions or excavations, over asphalt or black liners (such as HPDE) would dictate that the device should be located near the area to account for the difference in the globe temperature due to radiance and reflection. Work on open soil/gravel will have a lesser affect on the readings and will allow the readings to be indicative of a large area (up to several miles). (Note WBGT Index readings for the area can frequently be obtained on a real-time basis from weather stations, or from the internet).

3.0 HEAT STRAIN GENERAL WORK CONTROLS

General controls for Heat Strain prevention and control include:

- Provide accurate verbal and written instructions, annual training programs and other information about heat stress and strain.
- Encourage drinking small volumes (approximately 1 cup) of cool, palatable water (or other acceptable fluid replacement drink, (e.g. sport drink) about every 20 minutes.
- Permit self-limitation of exposures and encourage co-worker observation to detect signs and symptoms of heat strain in others.
- Counsel and monitor those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal or sweat gland functions and those who abuse or are recovering from the abuse of alcohol or other intoxicants.
- Encourage healthy life-styles, idea body weight and electrolyte balance

- Adjust expectations of those returning to work after absence from hot exposure situations and encourage consumption of salty foods (with approval of physician if on a salt-restricted diet).
- Consider preplacement medical screening to identify those susceptible to systemic heat injury.
- Monitor the heat stress conditions and reports of heat related disorders.

4.0 JOB SPECIFIC CONTROLS FOR HEAT STRAIN STRESS

When excessive heat strain is observed or predicted based on monitoring, the some or all of the following Job Specific Controls should be considered:

- Engineering controls that reduce the metabolic rate, provide general air movement, reduce process heat and water vapor release, and shield radiant heat sources, among others.
- Administrative controls that set acceptable exposure times, allow sufficient recovery, and limit physiological strain.
- Personal protection that is demonstrated effective for the specific work practices and conditions at the location.

5.0 PHYSIOLOGICAL MONITORING

5.1 Monitoring Frequencies

Physiological monitoring will commence at the discretion of the ESS, or when WBGT Index monitoring is not used and the ambient temperatures exceed 70^{o} F (21^{o} C). Physiological monitoring may be used whenever work/recovery regimens are implemented to verify the effectiveness of the work/rest ratio including the cool down periods. Physiological monitoring should be used whenever workers have the potential to exceed the TWA or TLV, and must be used when personnel are working in impermeable clothing

Work in impermeable protective clothing should include consideration of a buddy rule (no lone workers), particularly at higher temperatures. The observers should be watching for sudden or severe fatigue, lightheadedness, loss of balance, loss of judgment or clumsiness that may indicate heat fatigue or heat stress.

The monitoring frequencies may be adjusted for individuals after experience with their work in heat stress environments has been gained provided the work involved, PPE, and other factors remain the same.

Attachment 4 is an Example forms that may be used for WBGT monitoring and individual physiological monitoring

5.2 Pulse Rate Monitoring

The level of stress may also be monitored by an individual's pulse rate. If either of the following occur, the individual should be removed from heat stress exposure:

- A sustained (several minutes) heart rate is in excess of 180 beats per minute (bpm) minus the individual's age in years (180-age), for individuals with normal cardiac performance. or

- A recovery heart rate greater than 120 bpm one minute after a peak work effort

The affected individual should be removed from the heat stress exposure and allowed to recover.

A recovery heart rate less than 110 bpm at indicates the individual can return to work but the work period should be adjusted. Shorten the next work period by one third while maintaining the same rest period. Increase the monitoring on the individual.

Pulse rates can be taken with an electronic pulse meter, or manually with a stopwatch for 30 seconds.

5.3 Body Core Temperature

Obtaining an accurate body core temperature for sustained work can be difficult, as the body will start to cool as soon as work is stopped or if protective clothing is removed and evaporation rates are increased. Monitor personnel as soon as possible to obtain an accurate temperature following the manufacturer's instructions for the particular instrument used. A body core temperature greater than 101.3^{o} F (38.5^{o} C) for medically selected and acclimatized personnel, or greater than 100.4^{o} F (38^{o} C) in unselected, unacclimatized workers may mark excessive heat strain and an individual's exposure to heat stress should be discontinued.

Average Body temperature varies between individuals and within individuals, typically fluctuating 1 degree F above or below the scientific "norm" of 98.6^{o} F (37^{o} C) oral temperature, depending on activity and general health.

Temperatures taken at the ear (tympanic temperature) has been developed. Current information indicates that an ear temperature reading will be 0.5 to 1.0^{o} F (0.3 to 0.6^{o} C) higher than an oral temperature reading, since the eardrum shares blood supply with the hypothalamus in the brain. An armpit (axillary) temperature is typically 0.5 to 1.0^{o} F (0.3 to 0.6^{o} C) lower than an oral temperature reading and may take up to 10 minutes to get an accurate reading.

Temporal or forehead thermometers use skin temperature to determine the body temperature. Due to the variations of the location and effects of evaporation, these are not as accurate as electronic and ear thermometers, however they offer other benefits of speed and accessibility when an individual may be fully suited.

Take the oral, ear or temporal temperature immediately at the start of the rest period. If the temperature exceeds 99.5^{o} F (37.5^{o} C) (oral or adjusted to oral) shorten the next work period by a third. Do not return the worker to hot work in semi-permeable or impermeable clothing until the body temperature is less than 99.5^{o} F (37.5^{o} C).

Body temperatures may be taken with disposable oral thermometers or infrared ear drum scanners. Temporal infrared thermometers are also available and may be considered to be less intrusive to the workers than oral or ear measurement devices.

(Note- Instruments coming in contact with skin or body fluids (sweat, saliva, etc) should either be used with disposable covers or sanitized between use.)

5.4 Removal from Exposure

If an individual requires a shortening of the work period on more than two consecutive monitoring periods, or repeatedly over a few days, they should be removed from exposure to hot environments, wearing semi-permeable, impermeable protective clothing until examined and cleared for such work by the consulting physician.

If a worker appears to be disoriented or confused, suffers inexplicable irritability, malaise, or chills, the worker should be removed for rest in a cool location with rapidly circulating air and kept under skilled observation. Absent medical advice

to the contrary, treat this as an emergency with immediate transport to a hospital. An emergency response plan is necessary.

The heat stroke victim is often manic, disorientated, confused, and delirious or unconscious. treat this as an emergency with immediate transport to a hospital. The victim's body core temperature is greater than 104^{o} F (40^{o} C). If signs of heat stroke appear, start aggressive cooling immediately. Emergency care and hospitalization are essential. An emergency response plan is necessary.

Prolonged increases in deep body temperature and chronic exposures to high level of heat stress are associated with other disorders, such as temporary infertility (male and female), elevated heart rate, sleep disturbance, fatigue and irritability. During the first trimester of pregnancy, a sustained core temperature greater than 102.2^{o} F (39^{o} C) may endanger the fetus.

ATTACHMENT 3

COLD STRESS MONITORING AND WORK/RECOVERY REGIMENS

1.0 INTRODUCTION

Cold Stress TLVs are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV Objective is to prevent the deep body temperature from falling below 96.8^{o} F (36^{o} C) and to prevent cold injury to body extremities. For a single, occasional exposure to a cold environment, a drop in the core temperature to no lower than 95^{o} F (35^{o} C) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

This attachment includes guidance for monitoring and preventing cold stress in accordance with the 2007 ACGIH.

2.0 COLD STRESS EVALUATION AND CONTROL

Workers that will subject to working in cold environments should be familiarized with the symptoms and effects of cold work. This should include awareness of the effects of medication, use of alcohol on the worker, as well as recognizing the symptoms of frostnip, frostbite, and hypothermia.

The ESS with support by the PESM should evaluate the workplace conditions and implement the controls appropriate for the work being performed and the work environment.

2.1 Thresholds

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -25.6^{o} F (-32^{o} C). Superficial or deep local tissue freezing will occur only at temperatures below 30.2^{o} F (-1^{o} C) regardless of wind speed. Table 1provides the Equivalent Chill Temperatures on exposed flesh.

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

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

- If fine work is to be performed with bare hands for more than 10-20 minutes in a temperature below 60.8^{o} F (16^{o} C), special provisions should be made for keeping workers hands warm, such as warm air jets, radiant heaters or contact warm plates. Metal handles of tools and control bars should be covered with thermal insulating materials below 30.2^{o} F (-1^{o} C).
- If the air temperature falls below 60.8^{o} F (16^{o} C) for sedentary, 39.2^{o} F (4^{o} C) for light, 19.4^{o} F (-7^{o} C) for moderate work, and fine manual dexterity is not required, then gloves should be used by workers.
- To prevent frostbite, the workers should wear anti-contact gloves.

- When cold surfaces below 19.4° F (-7° C) are probable, a warning to workers should be given to prevent inadvertent contact by bare skin.
- If air temperatures are 0° F (-17.5° C) or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so they can be handled and used without removing the mittens.

Provisions for additional total body protection are required if work is performed in an environment at or below 39.2° F (4° C), including:

- Workers should wear cold protective clothing appropriate for the level of cold and physical activity.
- If the air velocity at the work site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and the worker may become wet on the job site, the outer type of clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent and the outerwear changed as it becomes wetted. Outer garments should have provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If a worker's clothes have become wet by sweat, the worker should change into dry clothes before entering the cold area. Workers should change socks and any removable liners or felt insoles at regular daily intervals, or use vapor barrier boots.
- If exposed area of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent frostbite or hypothermia, work should be modified or suspended until adequate clothing is available or until weathers conditions improve.
- Workers handling evaporative liquids (gasoline, alcohol, etc) at air temperatures below 39.2° F (4° C) should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporate cooling.

2.2 Work Warming Regimens

For work performed continuously in the cold at an equivalent chill temperature (ECT) or below 19.4° F (-7° C), heated warming shelters should be made available nearby with workers encouraged to use these shelters at regular intervals. The frequency of use should be dependent of the severity of the exposure. Table 2 provides a Work/Warm-up schedule for a four-hour schedule.

The onsite of shivering, minor frostbite, the feeling of excessive fatigue, drowsiness, or euphoria are indications for immediate return to the shelter. When entering the heated shelters, outer clothing should be removed and the remainder of clothing loosened or opened to permit sweat evaporation or a change of dry clothing provided.

Dehydration occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee or other diuretics should be limited.

For work practices at or below 10.4° F (-12° C) the following should be considered:

- Workers should be under constant protective observation (buddy system or supervision)
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work must be performed, rest periods should taken in heated shelters and the opportunity for changing into dry clothing provided.

- New employees should not be required to work fulltime in the cold during the first few days until they become accustomed to the working conditions and the required protective clothing.
- The weight and bulkiness of clothing should be factored into the estimates of required work performance and weights to be lifted by the worker.
- Work should be organized so that sitting still or standing still for long periods is minimized. Unprotected metal chairs should not be used. The worker should be protected from drafts to the greatest extent possible.
- Eye protection for workers employed out-of-doors in a snow or ice covered condition should be supplied. Special safety goggles to protect against ultraviolet light and glare that can cause temporary conjunctivitis and or temporary loss of vision, and blowing ice crystals when there is an expanse of snow coverage.
- Workers should be instructed in safety and health procedures related to cold environments work, including:
    - Proper rewarming procedures
    - First aid treatment
    - Proper eating and drinking habits
    - Recognition of impending frostbite
    - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
    - Safe work practices

2.3 Workplace Monitoring

Suitable thermometry should be arranged at the any workplace where the environment is below 60.8° F (16^{o} C) so that overall compliance with the TLV can be maintained. Whenever the air temperature falls below 30.2^{o} F (-1^{o} C), the dry bulb temperature should be measured and recorded at least every 4 hours.

Wind speed should be monitored and recorded when the rate exceeds 5 mph (2 m/s). When monitoring, the Equivalent Chill Temperature (ECT) should be recorded with the temperature and wind speed.

Individual employees should be excluded from working in cold at 30.2^{o} F (-1^{o} C) or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -11.2^{o} F (-24^{o} C) with no wind, or -18^{o} F (0^{o} C) with wind speeds above 5 mph should be medically evaluated as suitable for such temperatures.

Provisions for providing first aid for trauma sustained in freezing or subzero conditions are required because an injured worker is predisposed to cold injury and should be protected against preventing hypothermia or freezing of damaged tissues in addition to providing the first aid.

Table 1 - Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperatures (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind Speeds > 40 mph have little additional Effect	**LITTLE DANGER** In < hr with dry skin. Maximum danger of false sense of security				**INCREASING DANGER** Danger from freezing of exposed flesh within one minute				**GREAT DANGER** Flesh may freeze within 30 seconds			
	Trenchfoot and immersion foot may occur at any point on this chart Grayed areas = Equivalent Chill Temperature requiring dry clothing to maintain core body temperature above 96.8° F (36° C) per cold stress TLV											

* Developed by U.S Army Research Institute of Environmental Medicine, Natick, MA. As provided in American Conference Of Governmental Industrial Hygienists TLVs and BEIs 2006

TABLE 2 – WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT

Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind (8 k/hr)		10 mph Wind (16 K/hr)		15 mph Wind (24 k/hr)		20 mph Wind (32 k/hr)	
°F (Approx)	°C (Approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks
-15 to -19	-26 to -28	Normal breaks	1	Normal breaks	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	-29 to -31	Normal Breaks	1	75 min.	2	55 min.	3	40 min	4	30 min.	5
-25 to -29	-32 to 34	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease	
-30 to -34	-35 to -37	55 min.	3	40 min.	4	30 min.	5	Non-Emergency work should cease			
-35 to -39	-38 to -39	40 min.	4	30 min.	5	Non-Emergency work should cease					
-40 to -44	-40 to -42	30 min.	5	Non-Emergency work should cease							
-45 & below	-43 & below	Non-Emergency work should cease									

Notes:

1 Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step low. For example, at -30 F (-35 C) with no noticeable wind (step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (step 5).

2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph - light flag moves, 10 mph – light flag fully extended, 15 mph – raises newspaper sheet, 20 mph – blowing & drifting snow.

3. TLVs apply only for workers in dry clothing.

Attachment 4 Example WBGT Monitoring Form

TETRA TECH EC, INC.

HEAT STRESS MONITORING LOG

DATE: _____ WBGT Location:_____

TIME	WBGT	AIR TEMP	NOTES & NOTIFICATIONS

WBGT – Wet Bulb Globe Temperature
Heat Strain potential Worker Body Core Temp: 101.3 F for acclimated Workers, 100.4 F for unacclimated workers

Monitor Name:_____

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